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

Form 20-F

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

OR

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

For the fiscal year ended December 31, 2019

OR

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

OR

☐ 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)

5 David Fikes St., P.O. Box 266Rehovot7610201, 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	Trading Symbol(s)	Name of each exchange on which registered
Ordinary Shares, nominal value NIS 0.01 per share	NVMI	The Nasdaq Global Select 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: 28,005,617 ordinary shares, NIS 0.01 nominal (par) value per share, as of December 31, 2019.

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

Yes ☐ No ☒

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 ☐ No ☒

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 ☒ No ☐

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 ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or an emerging growth company. See definition of "accelerated filer and large accelerated filer" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☒	Accelerated filer ☐	Non-accelerated filer ☐
		Emerging growth company ☐

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ☐

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

U.S. GAAP ☒

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

Other ☐

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 ☐ Item 18 ☐

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 ☐ No ☒

TABLE OF CONTENTS

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", "plan", or similar expressions identify "forward looking statements". Such statements, including without limitation, statements relating to our anticipated sales, revenues and expenses, 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, 2019 and 2018 and for the years ended December 31, 2019, 2018 and 2017 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, 2017, December 31, 2016 and 2015 and for the years ended December 31, 2016 and December 31, 2015 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,				
	2015	2016	2017	2018	2019
	(in thousands, except per share data)				
Consolidated Statement of Operations Data:					
Revenues	$ 148,514	$ 163,903	$ 221,992	$ 251,134	$ 224,909
Cost of revenues	71,434	88,623	90,805	105,900	103,089
Gross profit	77,080	75,280	131,187	145,234	121,820
Operating expenses:					
Research and development expenses, net	39,703	34,998	38,956	45,451	44,508
Sales and marketing expenses	15,967	21,523	24,554	28,847	29,080
General and administrative expenses	8,511	6,835	8,100	8,735	10,066
Amortization of intangible assets	1,318	1,758	1,758	1,759	1,758
Total operating expenses	65,499	65,114	73,368	84,792	85,412
Operating profit	11,581	10,166	57,819	60,442	36,408
Financing income, net	643	1,216	2,276	2,984	3,078
Income before income taxes	12,224	11,382	60,095	63,426	39,486
Income taxes expenses (benefit)	(3,501)	1,738	13,636	9,051	4,315
Net income for the year	$ 15,725	$ 9,644	$ 46,459	$ 54,375	$ 35,171
Earnings per share:					
Basic	$ 0.58	$ 0.35	$ 1.68	$ 1.94	$ 1.26
Diluted	$ 0.57	$ 0.35	$ 1.63	$ 1.89	$ 1.23
Shares used in calculation of net earnings per share:					
Basic	27,185	27,175	27,696	28,022	27,895
Diluted	27,510	27,503	28,524	28,765	28,574

	December 31,				
	2015	2016	2017	2018	2019
			(in thousands)		
Consolidated Balance Sheet Data:					
Working capital	$ 112,819	$ 128,872	$ 179,782	$ 233,499	$ 255,982
Total assets	207,269	218,593	283,285	333,430	400,443
Capital stock (including additional paid-in capital)	113,022	117,102	122,500	122,386	120,811
Shareholders' equity	161,060	174,717	226,736	280,740	314,539

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 three 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 three process control product lines. We expect revenues from these product lines to continue to account for a substantial portion of our revenues in the coming years. 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.

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 front end 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. As a result of our customer concentration, our financial performance may fluctuate significantly from period to period based, among others, on exogenous circumstances related to our clients. For example, it is possible that any of our major customers could terminate its purchasing relationship with us or significantly reduce or delay the amount of our products that it orders, purchase products from our competitors, or develop its own products internally. 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. For more information regarding our sales by major customers as percentage of our total sales, see Note 11 to our consolidated financial statements contained elsewhere in this report.

The markets we target are 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 cyclical, experienced steep downturns and upturns between the years 2008 and 2019. In recent years, we have seen a more stable overall capital investment patterns, yet we cannot predict the length and strength of potential future 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 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. 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:

- 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.

Furthermore, during 2019, we increased our leased facilities and related investments and our operating expenses. In the event of a global recession or certain other economic conditions forcing the Company to materially reduce its expenses, portions of such facilities may be rendered obsolete. 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 changes, 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 changes, 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 continuous cooperation with Process Equipment Manufacturers ("PEMs") to enable sales of our integrated metrology systems, and the loss of PEMs 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 to sell semiconductor equipment products that are able to integrate with our metrology systems. If our PEMs are unable to sell such products, if they choose to focus their attention on products that do not integrate our systems, or if they choose to develop their own metrology solutions, 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 significantly harm our business. In addition, we may not be able to develop or market new integrated metrology products, which could slow or prevent our growth.

Some of our commercial agreements with PEMs and customers may include exclusivity provisions and limitations on the use of certain intellectual property. Such limitations may prevent us from engaging in certain business relationships with third parties, and may limit our ability to use certain elements of our intellectual property. As a result, our ability to introduce new products in relevant markets might be affected.

Some of our commercial agreements with PEMs and customers may include exclusivity provisions, which prevent us from engaging in certain business relationships with third parties. In addition, some of our commercial agreements with PEMs also include limitations on the use of certain joint intellectual property. These exclusivity obligations and limitations are often used as a tool to promote the development and the penetration of innovative new solutions, and are usually limited in terms of scope and length. When considering whether to enter into any such exclusivity arrangements or accepting such limitations, we usually take into 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 or limiting undertakings. Exclusivity obligations or limitation of use relating to certain parts of our technology and products may affect our ability to commercialize our products, engage in potentially beneficial business relationships with third parties (including by means of a merger or acquisition), 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.

Increased information technology security threats, more sophisticated computer crime, and changes in privacy laws could disrupt our business.

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. In light of information technology security threats, we have implemented network security measures and engaged the services of a cybersecurity consulting firm to conduct an information security risk assessment review which was reviewed and discussed by our audit committee and board of directors. In the current environment, there are numerous and evolving risks to cybersecurity and privacy, including criminal hackers, hacktivists, state-sponsored intrusions, industrial espionage, employee malfeasance and human or technological error. High-profile security breaches at other companies and in government agencies have increased in recent years, and security industry experts and government officials have warned about the risks of hackers and cyberattacks targeting businesses such as ours. Computer hackers and others routinely attempt to breach the security of technology products, services and systems, and to fraudulently induce employees, customers, or others to disclose information or unwittingly provide access to systems or data.

Although we have invested in measures to reduce these risks, we can provide no assurance that our current IT systems are fully protected against third-party intrusions, viruses, hacker attacks, information or data theft or other similar threats. The cost and operational consequences of implementing, maintaining and enhancing further data or system protection measures could increase significantly to overcome increasingly intense, complex, and sophisticated global cyber threats. Despite our best efforts, we are not fully insulated from data breaches and system disruptions and, accordingly, we have experienced and expect to continue to experience actual or attempted cyberattacks of our IT networks. Although none of these actual or attempted cyberattacks has had a material adverse effect on our operations or financial condition thus far, we cannot guarantee that any such incidents will not have a material adverse effect on our operations or financial condition in the future. Any material breaches of cybersecurity or media reports of perceived security vulnerabilities to our systems or those of the Company's third parties, even if no breach has been attempted or occurred, could cause us to experience reputational harm, loss of customers and revenue, regulatory actions and scrutiny, sanctions or other statutory penalties, litigation, liability for failure to safeguard our customers' information, or financial losses that are either not insured against or not fully covered through any insurance maintained by us. Any of the foregoing may have a material adverse effect on our business, operating results and financial condition.

As such, 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 our facility or at customer sites, or could be subject to system failures or malfunctions for other reasons. Increased information technology security threats and more sophisticated computer crime pose a risk to the security of our systems and networks and the confidentiality, availability and integrity of our data or customer data. Cybersecurity attacks could also include attacks targeting the security, integrity and/or reliability of the hardware and software installed in our products. System failures or malfunctioning could disrupt our operations and our ability to timely and accurately process and report key components of our financial results.

Further, the regulatory framework for privacy and security issues worldwide is rapidly evolving and is likely to remain uncertain for the foreseeable future. In the European Union, the General Data Protection Regulation (GDPR) imposes more stringent data protection requirements and provides for greater penalties for noncompliance. The California Consumer Privacy Act (CCPA), enacted in 2018 and entered into effect in January 2020, creates new consumer rights relating to the access to, deletion of, and sharing of personal information that is collected by businesses. Any inability to adequately address privacy and security concerns or comply with applicable privacy and data security laws, rules and regulations could have an adverse effect on our business prospects, results of operations and/or financial position.

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 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.

There can be no assurance that revenues from future products or product enhancements will be sufficient to recover the development costs or to ensure the sale of inventory related to these products

We must continue to make significant investments in research and development in order to introduce new products and technologies, or to enhance the performance, features and functionality of our existing products, to keep pace with the competitive landscape and to satisfy customer demands. Substantial research and development costs are typically incurred before we confirm the technical feasibility and commercial viability of a new product, and not all development activities result in commercially viable products. There can be no assurance that revenues from future products or product enhancements will be sufficient to recover the development costs associated with such products or enhancements. In addition, we cannot be sure that these products or enhancements will receive market acceptance or that we will be able to sell these products at prices that are favorable to us. Our business will be seriously harmed if we are unable to sell our products at favorable prices or if the market in which we operate does not accept our products. In addition, in some cases, we accumulate inventories based on sales forecasts. If such sales forecasts are not materialized, we might need to write-off the related inventory, which will increase our losses.

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. We cannot provide assurances that we will not incur any costs or liabilities or experience any 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.

Since the 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 well. We plan to increase our aggregate operating expenses in 2020 relative to 2019. 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 per product line magnifies the risk of an interruption in our production capabilities.

We have one manufacturing facility for our Optical CD product lines, which is located in Weizman Science Park, Rehovot, Israel, and one manufacturing facility for our XPS product line, which is located in Fremont, CA, US (the "Manufacturing Facilities"). These Manufacturing Facilities include special clean room environments and manufacturing jigs, which are customized to our needs. In addition, most of our ongoing inventories, including our main warehouse and work in process, are located in these Manufacturing Facilities. Although we adopted a disaster recovery plan, any event affecting any of our Manufacturing Facilities, 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 Facilities include provisions that exempt the landlord and others from liability for damages to our Manufacturing Facilities.

Pursuant to the lease agreements for our Manufacturing Facilities, the landlord and anyone on its behalf, and additional tenants are exempt from any liability for direct or consequential damages to our Manufacturing Facilities, except in the event of willful misconduct. While we have obtained insurance policies 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 cancellation 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 within a specific year can fluctuate significantly. 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 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 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 Onto Innovation Inc. (formerly Nanometrics and Rudolph Technologies, who have merged during the second half of 2019), and KLA Corp., which manufacture and sell integrated and/or stand-alone process control systems. In addition, we compete with PEMs, such as ASML Holdings N.V., and Applied Materials Inc., which develop (or might as well acquire companies which develop) in-situ sensors and metrology 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 our solution 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:

- the contribution and value our solutions bring to our customers;
- our product innovation, 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 has undergone consolidation over the last few years. For example, in 2011, Nanometrics acquired Nanda Technologies, and in 2015, we acquired ReVera Inc. In addition, over the past few years a major consolidation occurred in the process equipment manufacturers segment, such as Applied Materials Inc., acquiring Varian Semiconductor Equipment Associates in 2011; Lam Research Corporation acquiring Novellus Systems Inc. in 2016 and Coventor in 2017; Thermo Fisher Scientific Inc. acquired FEI Company, Inc. in 2016; ASML Holdings N.V. acquired Hermes Microvision Inc. in 2016; KLA Corporation acquired Orbotech Ltd. in 2019; and the merger between Nanometrics Incorporated and Rudolph Technologies, Inc. in 2019. We believe that similar acquisitions and business combinations involving our competitors, our customers and the PEMs 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 services, 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 and/or customers could jeopardize our competitive position.

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

Any acquisition 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;
- failing to comply with governmental requirements pertaining to acquisitions of local companies or assets by foreign entities;
- being unable to integrate new technologies or personnel;
- incurring the expenses of any undisclosed or potential liabilities; and
- the departure of key management and employees.

If we are unable to successfully complete our future acquisitions or to effectively complete the integration of our 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 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. Further, in certain cases, mergers and acquisitions require special approvals, or are subject to scrutiny by the local authorities, and failing to comply with such requirements or to receive such approvals, may prevent or limit our ability to complete the acquisitions as well as expose us to legal proceedings prior or following the consummation of such acquisitions. In some cases, such proceedings, if initiated, may conclude in a requirement to divest portions of the acquired business.

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 and indirect 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 and in direct 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.

In addition, such contracts and arrangements may include non-limited liability provisions for infringement of a third party's intellectual property rights in connection with our products.

Although we have not incurred in the past any material penalties for consequential or liquidated damages, we may incur such penalties in the future. Such penalties for consequential or liquidated damages may be significant (and so is the legal process conducted in connection with such penalties) 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, products or applications, our normal sales cycle takes between six (6) to twenty-four (24) 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 could harm our competitive position.

As of December 31, 2019, we have been granted more than 160 U.S. patents and have about 40 U.S. patent applications pending including U.S. provisional patent applications. In addition, we have been granted about 110 non-U.S. patents as well as several utility models registered and more than 100 non-U.S. patent and utility model applications pending as well as several utility model applications.

We cannot assure that:

- pending patent applications will be approved; or

- 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. 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, some of the patents which relate to our main-stream products have already expired or are expected to be expired in the coming years. Such expiration may add significant competition to our tools in this area, which may lead to a decrease in our incomes. In addition, some of the territories in which we have begun to operate intensively in the last few years are not covered by the patents we have been granted regarding these or other products and technologies, and this may lead to increased competition.

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.

Additionally, as part of our long-term technological collaboration, we are engaged with joint development activities with some of our strategic customers and vendors as well as with research institutes. These activities impose some limitations on the joint intellectual property developed as part of these programs.

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. Business Overview — 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 triple 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. Business Overview — 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 or a sole source. Disruption or termination of these sources could occur (due to several factors, including, but not limited to, bankruptcy, 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.

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.

The application of tax laws is subject to interpretation and if tax authorities challenge our methodologies or our analysis of our tax rates it could result in an increase to our worldwide effective tax rate and cause us to change the way we operate our business.

The application of the tax laws of various jurisdictions to our international business activities is subject to interpretation and also depends on our ability to operate our business in a manner consistent with our corporate structure and intercompany arrangements. The tax authorities of the jurisdictions in which we operate may challenge our methodologies for valuing developed technology or intercompany arrangements, including our transfer pricing, or determine that the manner in which we operate our business does not achieve the expected tax consequences, which could result in tax and penalty payments and in an increase of our worldwide effective tax rate, and could adversely affect our financial position and results of operations.

A certain degree of judgment is required in evaluating our tax positions and determining our provision for income taxes. In the ordinary course of business, there are many transactions and calculations for which the ultimate tax determination is uncertain. For example, our effective tax rates could be adversely affected by earnings being lower than anticipated in countries where we have lower statutory rates and higher than anticipated in countries where we have higher statutory rates, by changes in foreign currency exchange rates or by changes in the relevant tax, accounting and other laws, regulations, principles and interpretations. As we operate in numerous taxing jurisdictions, the application of tax laws can be subject to diverging and sometimes conflicting interpretations by tax authorities of these jurisdictions. It is not uncommon for taxing authorities in different countries to have conflicting views. In addition, tax laws are dynamic and subject to change as new laws are passed and new interpretations of the law are issued or applied. For example, the work being carried out by the OECD on base erosion and profit shifting as a response to increasing globalization of trade could result in changes in tax treaties or the introduction of new legislation that could impose an additional tax on businesses. As a result of changes to laws or interpretations, our tax positions could be challenged, and our income tax expenses could increase in the future.

For instance, if tax authorities in any of the countries in which we operate were to successfully challenge our transfer prices, they could require us to reallocate our income to reflect transfer pricing adjustments, which could result in an increased tax liability to us. In addition, if the country from which the income was reallocated did not agree with the reallocation asserted by the first country, we could become subject to tax on the same income in both countries, resulting in double taxation. If tax authorities were to allocate income to a higher tax jurisdiction, subject our income to double taxation or assess interest and penalties, it could increase our tax liability, which could adversely affect our financial position and results of operations.

The disclosure rules regarding the use of conflict minerals may affect our relationships with suppliers and customers.

The Securities and Exchange Commission requires certain disclosure by companies that use conflict minerals in their products, with substantial supply chain verification requirements in the event that the materials come from, or could have come from, the Democratic Republic of the Congo or adjoining countries. These rules and verification requirements may impose additional costs on us and on our suppliers, and limit the sources or increase the prices of materials used in our products. Among other things, this rule could affect sourcing at competitive prices and availability in sufficient quantities of certain minerals used in the manufacture of components that are incorporated into our products. In addition, the number of suppliers who provide conflict-free minerals may be limited, and there may be material costs associated with complying with the disclosure requirements, such as costs related to the process of determining the source of certain minerals used in our products, as well as costs of possible changes to products, processes, or sources of supply as a consequence of such verification activities. We may not be able to sufficiently verify the origins of the relevant minerals used in components manufactured by third parties through the procedures that we implement, and we may encounter challenges to satisfy those customers who require that all of the components of our products be certified as conflict-free, which could place us at a competitive disadvantage if we are unable to do so. While we have created processes and procedures designed to enable compliance to these rules, if in the future we are unable to certify that our products are conflict free, we may face challenges with our customers, which could place us at a competitive disadvantage and harm our reputation.

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, Singapore, the United States and Europe, and we produce our products in Israel and the United States. International operations expose us to a variety of risks that could seriously impact our financial condition and impede our growth including:

- instability in political or economic conditions, including but not limited to inflation, recession, foreign currency exchange restrictions and devaluations, restrictive governmental controls on the movement and repatriation of earnings and capital, and actual or anticipated military or political conflicts, particularly in emerging markets;

- intergovernmental conflicts or actions, including but not limited to armed conflict, trade wars and acts of terrorism or war; and

- interruptions to the Company's business with its largest customers, distributors and suppliers resulting from but not limited to, strikes, and financial instabilities. 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.

In addition, effective October 30, 2018, the U.S. Department of Commerce has taken action to restrict exports to Fujian Jinhua Integrated Circuit Company, Ltd. (Jinhua) by adding them to the Entity List (Supplement No. 4 to Part 744 of the Export Administration Regulations (EAR), claiming that Jinhua poses a significant risk of becoming involved in activities that are contrary to the national security interests of the United States. On November 1, 2018, a federal grand jury indicted JHICC, along with four other criminal defendants, charging them with crimes related to a conspiracy to steal, convey, and possess stolen trade secrets of an American semiconductor company for the benefit of a company controlled by the PRC government. JHICC has acquired several of our metrology solutions in the past, and due to the abovementioned export ban our U.S. subsidiary and MMD division is currently not able to ship any tools or parts or provide any form of service to JHICC, until it is cleared to resume by the appropriate authorities. In some cases, these export restrictions might also be applicable to the products which we export from Israel.

Additionally, the uncertainty of the economic, financial, regulatory, trade, tax and legal implications of the withdrawal of the U.K. from the E.U. (“Brexit”) and other significant political developments could also have a materially adverse effect on our business. All of these risks could also result in increased costs or decreased revenues, either of which could have a materially adverse effect on our profitability.

We may incur losses as a result of unforeseen or catastrophic events, including the recent outbreak of the novel coronavirus (COVID-19).

The occurrence of unforeseen or catastrophic events such as terrorist attacks, extreme terrestrial or solar weather events or other natural disasters, emergence of a pandemic, or other widespread health emergencies (or concerns over the possibility of such an emergency), could create economic and financial disruptions, and could lead to operational difficulties that could impair our ability to manage our business. In particular, the current outbreak of novel coronavirus (COVID-19) that was first reported from Wuhan, China, on December 31, 2019, including the resulting travel restrictions and quarantines already imposed by several countries, present concerns that may dramatically affect our ability to conduct our business effectively, including, but not limited to, effects on revenues from customers, potential inability to visit customer sites for sales and services purposes, and/or a potential disruption to our supply chain. The trajectory of the coronavirus remains uncertain and it is becoming increasingly plausible that our business, and the livelihood of our employees (including employees stationed in our main sites in Israel and the US) and customers upon both of which our business relies, may be directly afflicted.

Changes in U.S. trade policies and other factors beyond our control may adversely impact our business, financial condition and results of operations.

The international environment in which we operate is affected from inter-country trade agreements and tariffs. As a result of recent revisions in the U.S. administrative policy there are, and may be additional, changes to existing trade agreements, greater restrictions on free trade and significant increases in tariffs on goods imported into the United States, particularly those manufactured in China, Mexico and Canada. Future actions of the U.S. administration and that of foreign governments, including China, with respect to tariffs or international trade agreements and policies remains currently unclear.

The escalation of a trade war, tariffs, retaliatory tariffs or other trade restrictions on products and materials either exported by us to China or raw materials imported by us from China may significantly impeded our ability to provide our solutions and service our customers in China or other effected locations. Such developments may result in a decrease in demand for our products and technologies as well as delays in payments from our customers. Furthermore, other governmental action related to tariffs or international trade agreements, changes in U.S. social, political, regulatory and economic conditions or in laws and policies governing foreign trade, manufacturing, development and investment in the territories and countries, where our customers are located, could adversely affect our business, financial condition, operating results and cash flows.

We may be affected by instability in the global economy and by financial turmoil.

Instability in the global markets and in the geopolitical environment in many parts of the world as well as other disruptions may continue to put pressure on global economic conditions. In the event 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 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. For additional information on our major shareholders, see “Item 7A – Major Shareholders” in this annual report on Form 20-F.

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 40% of our outstanding ordinary shares are cumulatively held by seven 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 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, 2019, substantially all of our cash reserves were invested in bank institutions, of which approximately 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, 2019, 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

Political, economic and military instability in Israel may impede our ability to operate and harm our financial results.

Our principal executive offices and research and development facilities are located in Israel (Middle East) and therefore may be influenced by regional instability and extreme military tension. Accordingly, political, economic and military conditions in Israel and the surrounding region could directly affect our business. Any armed conflicts, political instability, terrorism, cyberattacks or any other hostilities involving Israel or the interruption or curtailment of trade between Israel and its present trading partners could affect adversely our operations. Ongoing and revived hostilities or other Israeli political or economic factors, could prevent or delay shipments of our products, harm our operations and product development and cause any future sales to decrease. In the event that hostilities disrupt the ongoing operation of our facilities or the airports and seaports on which we depend to import and export our supplies and products, our operations may be materially adverse affected.

On Israel’s domestic front there is currently a level of unprecedented political instability. The Israeli government has been in a transitionary phase since December of 2018, when the Israeli Parliament, or the Knesset, first resolved to dissolve itself and call for new general elections. In 2019, Israel held general elections twice – in April and September – and a third general election was held on March 2, 2020. The Knesset, for reasons related to this extended political transition, has failed to pass a budget for the year 2020, and certain government ministries, which may be critical to the operation of our business, are without necessary resources and may not receive sufficient funding moving forward. Given the likelihood that the current political stalemate might not be resolved during the next calendar year, our ability to conduct our business effectively may be adversely affected.

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 Exhibit 2.1 to this annual report on Form 20-F, “Description of Securities”. 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. In addition, starting January 1, 2019, in accordance with ASC 842 of lease accounting standard, we are required to present a significant NIS linked liability related to our operational leases in Israel. As a result, we are exposed to risk of devaluation of the U.S. dollar in relation to the NIS and other currencies. In such 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 2019, the U.S. dollar devaluated against the NIS by 7.79%, after being devaluated by approximately 10.1% 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 research and development grants. Some of these programs impose restrictions on our ability to use the technologies developed under these programs. The reduction or termination of these programs would increase our costs.

Until the end of 2016, we received royalty-bearing grants from the Israel Innovation Authority, or IIA (formerly known as the Office of the Chief Scientist of the Ministry of Economy and Industry, or the OCS), for the financing of certain of our research and development programs that meet specified criteria. Starting 2018, we also participate in IIA royalty free grant programs.

In addition, through the years, we participated in consortiums which are either solely managed by the IIA, or are joint consortiums of the IIA and the European Research Area. To maintain our eligibility for these programs, we must continue to meet certain conditions.

All these programs also restrict our ability to manufacture particular products and transfer particular technology, which were developed as part of the IIA’s programs, outside of Israel. The restrictions associated with these IIA’s programs may require us to obtain approval of the research and development committee nominated by the IIA for certain actions and transactions and pay additional payments to the IIA. Approval to manufacture products outside of Israel or consent to the transfer of technology, if requested, might not be granted and if granted, may increase our financial liabilities to IIA. In addition, if we fail to comply with certain restrictions associated with formerly received IIA's funding, we may be subject to criminal charges.

We are further exposed to risks related to the receipt of funding from other governments or governmental agencies in connection with strategic development programs, under which we receive funding. Under such strategic development programs, governments and governmental agencies typically have the right to terminate the program's funding at any time. In addition, a project may be terminated by a mutual agreement, if the parties determine that the project's goals or milestones are not being achieved. As a result, there is no assurance that these sources of external funding will continue to be available to us in the future. Moreover, under the terms of certain governmental funding programs in which we receive funding, the applicable granting agency has the right to audit the costs that we incur, directly and indirectly, in connection with such programs. Any such audit could result in modifications to, or even termination of, the applicable governmental funding program. Any adverse finding resulting from any such audit could lead to penalties (financial or otherwise), termination of funding programs, suspension of payments or other adverse consequences to our ability to receive governmental funding. In addition, obligations related to grants received from the IIA grants bear an annual interest rate based on the 12-month LIBOR. Currently, there is considerable uncertainty regarding the publication of LIBOR beyond 2021, and it is not possible to determine precisely whether, or to what extent, the replacement of LIBOR would affect companies' existing or future liabilities to the IIA.

We are subject to certain limitations related to the repatriation of funds that benefited from the tax exemption under the Approved and Benefited Enterprises, Preferred Enterprises and New Technological Enterprise Incentives regimes. The distribution or deemed distribution of such funds may be subject to recapture provisions under which we will be subject to the corporate tax that we were initially exempt from.

Until the end of 2015 we were eligible to receive certain tax benefits under Israeli law for capital investments as an Approved and Benefited Enterprise. In 2016, we made an election to receive tax benefits under Israeli law for capital investments as a "Preferred Enterprise". Starting 2017, we made an election to receive Tax benefits under Israeli "Economic Efficiency Law" as a "Preferred Technological Enterprise". While we believe that we meet the statutory conditions to entitle us to such benefits there can be no assurance that the tax authorities in Israel will concur to our position in general and for each specific year separately. We may be subject to additional taxes resulting from deemed dividend distribution of profits allocated to Approved Enterprise (Alternative Track) benefits, for example in case of a share repurchase or investment in foreign companies. Should it be determined that we have not, or do not meet such conditions, the benefits received would be cancelled. We would also be required to pay increased taxes or refund any benefits previously received, adjusted to the Israeli consumer price index and interest, or other monetary penalty. For additional information regarding Approved and Benefited Enterprise, Preferred Enterprise and Preferred Technological Enterprise see, "Item 10E. Taxation – Israeli Taxation" in this annual report on Form 20-F.

It should be noted that the Israeli government may reduce or eliminate the above-mentioned benefits in the future. The termination or reduction of these grants or tax benefits could harm our financial condition and results of operations, and result in significantly higher fluent tax payment. 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.

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 will 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.

Our business could be negatively affected as a result of actions of activist shareholders, and such activism could impact the trading value of our securities.

In recent years, certain Israeli issuers listed on United States exchanges have been faced with governance-related demands from activist shareholders, as well as unsolicited tender offers and proxy contests. Although as a foreign private issuer we are not subject to U.S. proxy rules, responding to these types of actions by activist shareholders could be costly and time-consuming, disrupting our operations and diverting the attention of management and our employees. Such activities could interfere with our ability to execute our strategic plan. In addition, a proxy contest for the election of directors at our annual meeting would require us to incur significant legal fees and proxy solicitation expenses and require significant time and attention by management and our board of directors. The perceived uncertainties due to these potential actions of activist shareholders also could affect the market price and volatility of our securities.

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, such as ineligibility for any preferential tax rates on capital gains or on dividends, interest charges on certain taxes treated as deferred, and additional reporting requirements under U.S. federal income tax laws and regulations. It may be possible for U.S. holders of our ordinary 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 for our 2019 taxable year we were not a PFIC. Nonetheless, because the determination of whether we are, or will be, a PFIC for a taxable year depends 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 2019. Absent one of the elections referenced 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 with respect to such U.S. holder in all succeeding years 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 2020 or subsequent years. 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 our assets, the trading price of our ordinary shares and the amount and type of our gross income. Therefore, there can be no assurances that we will not become a PFIC for the 2020 taxable year, 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 "Taxation - U.S. Taxation – Passive Foreign Investment Companies." Investors should consult their own tax advisors regarding all aspects of the application of the PFIC rules to our ordinary shares.

If a United States person is treated as owning at least 10% of our shares, such holder may be subject to adverse U.S. federal income tax consequences.

If a United States person is treated as owning (directly, indirectly or constructively) at least 10% of the value or voting power of our shares, such person may be treated as a "United States shareholder" with respect to each "controlled foreign corporation" in our group (if any). Because our group includes one or more U.S. subsidiaries, certain of our non-U.S. subsidiaries could be treated as controlled foreign corporations (regardless of whether we are or are not treated as a controlled foreign corporation). A United States shareholder of a controlled foreign corporation may be required to annually report and include in its U.S. taxable income its pro rata share of the controlled foreign corporation's "Subpart F income", "global intangible low-taxed income" and investments in U.S. property, whether or not such controlled foreign corporation makes any distributions. An individual that is a United States shareholder with respect to a controlled foreign corporation generally would not be allowed certain tax deductions or foreign tax credits that would be allowed to a United States shareholder that is a U.S. corporation. A failure to comply with these reporting obligations may subject you to significant monetary penalties and may prevent the statute of limitations with respect to your U.S. federal income tax return for the year for which reporting was due from starting. We cannot provide any assurances that we will assist investors in determining whether any of our current or future non-U.S. subsidiaries are treated as a controlled foreign corporation or whether such investor is treated as a United States shareholder with respect to any of such controlled foreign corporations or furnish to any United States shareholders information that may be necessary to comply with the aforementioned reporting and tax paying obligations. The Internal Revenue Service provided limited guidance on situations in which U.S. shareholders may rely on publicly available information to comply with their reporting and tax paying obligations with respect to foreign-controlled CFCs. A United States investor should consult their own advisors regarding the potential application of these rules to its investment in the shares.

The Tax Cuts and Jobs Act of 2017 could adversely affect our business and financial condition.

On December 22, 2017, President Trump signed into law new legislation, known as the Tax Cuts and Job Act of 2017 (the "US Tax Act"), that significantly revises the Code. The US Tax Act, among other things, contains significant changes to corporate taxation, including reduction of the corporate tax rate from a top marginal rate of 35% to a flat rate of 21%, limitation of the tax deduction for interest expense to 30% of adjusted taxable income (except for certain small businesses), limitation of the deduction for net operating losses to 80% of current year taxable income and elimination of net operating loss carrybacks, one-time taxation of offshore earnings at reduced rates regardless of whether they are repatriated, elimination of U.S. tax on foreign earnings (subject to certain important exceptions), immediate deductions for certain new investments instead of deductions for depreciation expense over time, and modifying or repealing many business deductions and credits (including reducing the business tax credit for certain clinical testing expenses incurred in the testing of certain drugs for rare diseases or conditions). Notwithstanding the reduction in the corporate income tax rate, the overall impact of the US Tax Act is uncertain, and our business and financial condition could be adversely affected. In addition, it is unknown if and to what extent various states will conform to the US Tax Act. The impact of the US Tax Act on holders of our ordinary shares is likewise uncertain and could be adverse. We urge our shareholders to consult with their legal and tax advisors with respect to this legislation and the potential tax consequences of investing in or holding our ordinary shares.

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 stock exchange.

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.

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. Since then, 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 and net profitability. In parallel, we continue to work with the process equipment manufacturers as business partners for future products and process control solutions.

In April 2015, we acquired ReVera Inc., a privately held company headquartered in Santa Clara, California, which develops, manufactures and sells stand-alone metrology tools for measurements of thin-films and composition applications in the semiconductor industry. Following its acquisition, ReVera became a wholly owned subsidiary of our U.S. subsidiary, Nova Measuring Instruments, Inc. Effective December 31, 2017, we merged ReVera into its parent company, Nova Measuring Instruments, Inc.

On November 1, 2018, we announced a $25 million share repurchase program.

We currently have five direct and indirect fully owned subsidiaries in the U.S., Japan, Taiwan, Korea and Germany.

Our headquarter office is located in Israel at 5 David Fikes St., 10^{th} Floor, Rehovot. Our telephone number at our main office is +972-73-229-5600. In 2018, we entered into a new lease agreement for the lease a total of approximately 12,000 square meters at a new building being built at the Science Park in Rehovot, and during 2019 we moved our Israel headquarters to this building. For more information about our new lease see “Item 4D. Property, Plant and Equipment.”

4.A.8.

The SEC maintains an internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC (http://www.sec.gov). The information is also available on our website (http://www.novami.com).

4.B Business Overview

We deliver continuous innovation by providing advanced metrology solutions for the semiconductor manufacturing industry. Deployed by the world’s largest integrated-circuit manufacturers, Nova’s novel technologies provide semiconductor manufacturers with process insight and clarity required to boost process performance, product yields and time to market. We bring pioneering metrology solutions to the world of process control, by industrializing lab technologies and developing emerging metrology solutions to enhance process control and facilitate our customers’ challenging technical transitions. We offer a combination of materials and dimensional metrology, advanced modeling algorithms that combine machine learning and big data within both integrated and standalone configurations, thereby enabling our customers to gain deeper insight throughout the entire development and manufacturing processes. We supply our metrology solutions to major semiconductor manufacturers worldwide, and are recognized for excellence since our first system was installed in 1995.

The semiconductor manufacturing process starts with a flat silicon disc known as a silicon wafer 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, create circuit patterns and perform other functions. The semiconductor manufacturing process requires precise 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 on 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 invested in our integrated metrology solutions as this continues to be an area where we have a leading position. In addition, we have developed stand-alone metrology systems, leveraging our technology, methods, metrology expertise and market position in the integrated metrology field to expand our offerings into the larger market for 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 endeavor 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 metrology products and stand-alone metrology products are compatible or complementary and used in a customized way to meet specific customer needs. An additional layer is our growing investment in software solutions, including our machine learning and modeling solutions in high volume manufacturing. Our holistic strategy brings together the traditional physical modeling, together with machine and deep learning, supported by a strong computational management layer.

In April 2015, through the acquisition of ReVera, we expanded our technology base. The foregoing technology added a unique capability to our product portfolio, allowing us to measure ultra-thin film thickness and composition for critical wafer fabrication steps. We believe that the combination of our XPS/XRF technology and our dimensional optical CD technology, creates a compelling and unique portfolio for the measurement of film, composition, material properties and critical-dimension (CD) parameters, which address today's growing challenges associated with the transition to advanced nodes in the semiconductor segments.

During 2017, as part of the post-acquisition integration of ReVera, we have reorganized into two product divisions. The Dimensional Metrology Division (DMD) which is responsible for the optical metrology (integrated and standalone) products, and the Material Metrology Division (MMD) which is responsible for the X-ray technology products. The corporate units, such as marketing, technology, human resources, finance and global business group, support both divisions. This reorganization allows us to focus the required management attention in each of our product lines as well as facilitate the integration of a future non-organic growth opportunities we might pursue. Demand for metrology systems is driven by capital equipment spending by semiconductor manufacturers, which in turn are driven by worldwide demand for semiconductor devices and technological transition processes, which are required from these devices for the most advanced high-end applications. Industry data indicates that through the years worldwide demand for semiconductors has been growing. We believe that this growth in demand will continue to generate demand for process control equipment, including metrology systems, as semiconductor manufacturers invest in technology and capacity expansion. We also believe that demand for metrology systems will be driven by the increasing cost of semiconductor manufacturing and by the requirements of semiconductor manufacturers for better control of process equipment. Finally, demand for metrology is strongly driven by technology challenges. The growing investment in advanced technology nodes and device structures introduces growing complexity and new challenges. Scaling limits and technology progress are continuously pushed in order to improve cost and gain competitive advantage. These fundamental elements create favorable market conditions for metrology growth where more process steps are needed, new novel materials are introduced and innovative structures and packaging solutions are incorporated. We believe that all the above market conditions set favorable business environment for growth.

Lastly, in an effort to contribute to the sustainable development of society and to create new corporate value, we have addressed certain environmental, social and governance (ESG) issues. With respect to the environment, our new headquarters located in Rehovot, Israel is certified as “Leed Gold” - LEED (Leadership in Energy and Environmental Design), which is a widely used green building rating system and provides a framework for healthy, highly efficient, and cost-saving green buildings. LEED certification is a globally recognized symbol for sustainability achievement and leadership. In addition, we are committed to responsible sourcing of minerals and have taken action to both increase transparency in our supply-chain and ensure responsible procurement by our suppliers and sub-suppliers. We conduct conflict minerals due diligence pursuant to the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas. In general, our production does not involve industrial waste, and any waste that is created from used metal and electronics components is being processed through authorized companies. We also implemented recycling measures in our facilities, and we use a mechanism for electricity saving in our offices. With respect to society, in 2019 we moved our headquarters to a different facility in order to create better working conditions and advanced accessibility options for the disabled. We hold an annual safety program which includes training and safety drills for our employees, and instituted a safety committee which is convened on a monthly basis to discuss safety measures. We implemented new security systems in our facilities, including the installation of security-camera recording devices and the use of coded badges used for entering our facilities. Our employees regularly participate in voluntary activity meant to contribute to the betterment of society in Israel, the US, Taiwan and China, as well as activities designed to promote science and technology amongst underprivileged youth.

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 better performance at lower prices. As a result, many new complex materials, structures and processes are being introduced into the semiconductor manufacturing ecosystem. Such materials include, among others, copper, cobalt, low-k and high-k dielectrics, silicon-on-insulator, silicon-germanium, III-V, strained silicon and raised source/drain. Manufacturers have transitioned in the past years toward 300 mm silicon wafers (from 200 mm silicon wafers). While 300 mm wafers can yield up to twice as many integrated circuits than 200 mm wafers, they also create new manufacturing challenges. For example, because 300 mm wafers can bend or bow more than twice that of 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 structures such as 3D FinFET transistors, GAA (Gate All Around), 3D-NAND and emerging memory structures. The growing complexity of semiconductor devices increase the complexity and the costs of the semiconductor manufacturing process, which has also been a driver for the growing 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, and may exceed $10 billion in 2019 for building mega fab 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 pace greater than the overall process equipment market since the challenges of meeting process design goals will become increasingly difficult such that process control equipment will 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 thousands of 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, more than 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 tight, 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 down to less than tens of angstroms 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. Although CVD equipment represents the largest equipment type, there are more segments in the thin-layer deposition equipment market as epitaxy, physical vapor deposition (PVD) and atomic layer deposition (ALD). 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 flatness challenges posed by ever smaller feature sizes and the critical need for ultra-flat foundation for high precision photolithography, manufacturers use process technology known as Chemical Mechanical Planarization, or CMP. CMP removes uneven film material deposited on the surface of the wafer from processes such as CVD and photolithography by carefully "polishing" 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 ensure process uniformity and help semiconductor manufacturers avoid costly rework and misprocessing, thereby increasing efficiency and profitability.

Process Control Requirement

The steps used to create semiconductors are accurate processes that require strict control of equipment performance and process sequences for the resulting semiconductors devices 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 is difficult to achieve, the number of sampled wafers will increase. The monitoring may include measurement of several parameters, such as the thickness and composition of the layers of thin film deposited, the dimensions of the features that are patterned through the photolithography process, as well as the registration or alignment between two consecutive layers, known as overlay and the material properties. 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, as 7nm and below, 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 and therefore needs much more inline monitoring.

- *Transition to 3D Device Structures*. Foundries have adopted 3D FinFET transistors starting at 14/16 nm technology nodes to get improved performance, use less power in 1x technology nodes and to increase gate density. Memory makers moved to 3D NAND and vertical structures for next generation NAND technology, and invest research and development resources in NanoSheets. These trends require process control with metrology solutions capable of measuring critical dimensions in these 3D structures.

- *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.

- *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. The accelerating rate of obsolescence of technology and the faster ramp to yield required by customers 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.

- *New Materials.* Copper metal layers continue to be the key material for the back end of line for advanced integrated circuits in order to increase performance and reduce the cost of integrated circuits. In addition, new material such as Cobalt and Ruthenium metals are being introduced at the first metal steps to enable reduction in resistivity. The Industry is continuously searching directions to reduce the effective K of the low K materials and to reduce the barrier thickness and material types. These changes require new processing and metrology equipment and thus represent challenging developments for the semiconductor manufacturing industry. In addition, 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 adoption of high-k dielectrics is a key element for gate control in the most advanced technology nodes of 16/14nm, 10nm, 7nm and 5nm currently in production, while R&D works to implement the next gate control material being done with Silicon Germanium and III-IV materials. These new materials, combined with metal layers, require new processing and metrology equipment in the atom level and thus represent a challenging development for the semiconductor manufacturing industry.

- *Increase use of EUV Lithography in production.* The continuous need for scaling in logic and memory has created increased usage of EUV (Extreme Ultraviolet lithography).

- *Increasing Use of Multi Patterning Lithography.* The continuous need for scaling to meet reduced transistor costs combined in pushing the industry to develop additional techniques on top of EUV lithography such as multi patterning, and E-BEAM. These alternative technologies are increasing the number of Etch and CMP process steps and thus increasing the process control and metrology steps in these areas accordingly.

- *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. The challenges associated with foundry in the following years relate to aspects such as: shortening the time to market, reducing costs and monitoring process complexity.

- *Growth in 3D-NAND Manufacturing.* As a result of recent years' transition from 2D planar NAND to 3D NAND structures and the increase in demand for NAND devices driven by smartphones and SSDs, memory IC manufacturers have significantly increased investment in 3D NAND manufacturing and in continuous development of 3D NAND technology to support reductions in cost-per-bit.

- *Growth in demand and reduction in the feature size for DRAM memory devices.* The continued scaling to 10nm process technology generations in DRAM -currently at 1Znm, combined with ongoing growth in DRAM bit volume demand generates the need for more accurate metrology solutions and increased investment in process control.

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 and that the demand for metrology will be even higher as a result of the short time cycle of each technology and the need to fast ramp from R&D to production.

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 on 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.

The Semiconductor Market – Update

Gartner Inc., forecasts the world GDP to grow by 2.4% in 2020 compared to an estimated increase of 2.5% in 2019.

Gartner Inc. forecasts semiconductor revenues to increase by 12.5% in 2020, compared to a decrease of 11.9% in 2019. In addition, Gartner Inc. forecasts capital spending and WFE sales in 2020 to decrease by 3.6% and 1.1% respectively, following an estimated decrease of 6.9% and 8.0% respectively in 2019 (Gartner Forecast: Semiconductor Wafer Fab Equipment (Including Wafer-Level Packaging), Worldwide, 4Q19 Update", published on December 30, 2019). The above forecasts were provided prior to the outbreak of the novel coronavirus COVID-19. See "Item 3D. Risk Factors" in this annual report on Form 20-F.

According to research reports, future demand drivers for semiconductors include 5G mobile devices, data centers infrastructure, Artificial Intelligence, Augmented and Virtual Reality, Smart Sensors, internet-of-things and other electronic equipment.

The Nova Approach

DMD Product lines

Optical CD Integrated Metrology

As node transitions become more complex, fabrication processes are becoming less stable and call for tight process control schemes that are closer to the actual process step and produce wafer to wafer variation control. Nova's approach is to lead the industry with solutions that can enable effective and accurate measurements in non-ideal process conditions. Our integrated metrology systems provide semiconductor manufacturers with effective and efficient process control by measuring wafers and their properties immediately after the process, 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 wafer fabrication process. Our integrated process control platform can be deployed in multiple processes and applications of semiconductor manufacturing cycle.

We believe that our integrated metrology systems can provide several important advantages to semiconductor manufacturers, enabling them to:

- utilize the process equipment wafer handling mechanism 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;
- 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 and cost will continue the trend of adopting integrated metrology solutions such as those we offer to multiple processes.

Optical CD 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 customers, we have come to realize that our technology can be extended beyond integrated metrology into areas such as stand-alone metrology. Initially we have developed stand-alone metrology tools to perform measurements similar to those performed by our integrated metrology tools. However, in recent years the optical capabilities and information content of the stand-alone metrology are beyond the capabilities of integrated metrology. The expression “stand-alone metrology” generically describes free standing metrology equipment, which is located in line, 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, deposition, 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 more areas of the fab.

We introduced this concept in 2006 and were successful in penetrating several major accounts since then, allowing us to see a significant increase in our overall customer base and revenues with the stand-alone products. With the introduction of stand-alone metrology, we have expanded our addressable markets beyond the previously served markets by integrated tools only.

Modeling and Software Solutions

The integrated and stand-alone products are combined with our suite of software modeling products comprised of NovaMARS® model-based and NovaFit™ machine learning modeling solutions and supported by the Nova HPC® (High Power Computing) platform. NovaMARS is our physical modeling and application development software that enables complex 2D, 3D and in-die measurements with high accuracy and fast time-to-solution. NovaFit modeling suite compliments traditional modeling of Optical Critical Dimensions by machine learning and data driven algorithmic solutions. The algorithmic suite works in conjunction with NovaMARS modeling engine to improve metrology performance, speed up time to solution and expand metrology envelope for enriched process control. NovaFit embeds the most advanced machine learning and big data architecture into optical modeling, revolutionizes the way customers utilize metrology measurement data and expands the metrology performance envelope to tighten process windows, avoid process excursions and improve yield. In addition to our modeling software solutions, we provide the Nova Fleet Management platform which is Nova solution for managing large fleets of metrology tools to deliver high productivity, operational efficiency and advanced analytics in high volume production environment of foundry and memory customers. The fleet management solution offers an easy and intuitive platform for managing and improving the overall productivity of Nova’s fleet of systems and is designed to address the needs and working methodologies of metrology and process engineers in the fab.

MMD Product Lines - Materials and TF Measurements

The growing usage of complex materials in advanced FinFET logic, DRAM and 3D NAND memory technology nodes has increased the demand for metrology solutions that can measure composition and film thickness with high precision and accuracy in recent years. Our materials metrology division has pioneered the materials metrology segment with products that utilize X-ray photoelectron spectroscopy (XPS) and X-ray fluorescence (XRF) spectroscopy, powerful technologies that have been optimized to provide the automation, speed and reliability required in today’s advanced semiconductor production environment. XPS is uniquely suited for the move to thinner films and smaller features, while improving the performance at each new technology node and XRF provides additional capabilities that expand our application space. Our X-ray products are used by logic and memory device manufacturers worldwide to measure, monitor and control critical device layers in high-volume production and to enable rapid development and control of complex, new processes. Nova products set the standard for High K – Metal Gate, tunnel oxide and capacitor film metrology.

Hybrid and Technology Synergies

As part of our holistic metrology approach that uses additional sources and channels of information to optimize the metrology performance, we have introduced hybrid metrology. Hybrid metrology combines measurements from multiple metrology toolset types in order to enable or improve the measurement of one or more critical parameters required for process control of advanced devices, materials and architectures. In the hybrid ecosystem, two or more toolsets measure the same or similar targets. The data from one toolset helps reducing the model degrees of freedom of the other toolset resulting in improved performance of the combined measurement in compare of that of any of the individual toolsets. Nova’s hybrid metrology solution is implemented in production in advanced technology nodes and is available with multiple metrology toolsets.

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 metrology solutions can interface with multiple process tools, allowing better control and smooth operation.

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

Following the acquisition of ReVera in April 2015, we have expanded our capabilities beyond dimensional metrology in the measurement of material composition and areal density of films down to sub-atomic thickness. These stand-alone products address issues in transistor gate dielectrics, work function adjustment materials, DRAM capacitor dielectrics, and 3D-NAND cell fabrication.

Our suite of technological capabilities includes:

- *Broadband Spectrophotometry.* Our broadband Spectrophotometry capabilities range from deep ultraviolet to 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 3 nm. 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's 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. Nova's advanced metrology solutions combine Spectral Interferometry (SI) technology, a powerful new capability for CD metrology, with state-of-the-art multichannel optical technology to extract unique information from the measured device, inaccessible by traditional optical CD technics.

- *Dark Field Spectral Reflectometry.* In order to further increase the variety of independent channels, we implemented measurement schemes based on the notion of dark-field (DF) detection.

- *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.

- *Computational Modeling for Electromagnetic and Optical Systems.* Our MARS multi-channel metrology modeling suite is capable of providing modeling solutions for the most advanced 3D structures in semiconductor manufacturing. It is a complete modeling and application development solution designed to provide high accuracy in short time to solution and is coupled with Nova's advanced computation hardware.

- *Advanced modeling empowered by physical and mathematical models*. Our NovaFit modeling software engine enhances traditional modeling capabilities with advanced machine learning algorithms. This modeling software improves metrology capabilities and accelerates time to solution in complex 3D and High Aspect Ratio devices. Together with Nova's Fleet Management solutions, NovaFit utilizes fleetwide information to provide adaptive advanced metrology solutions based on continuous training.

- *Hybrid Metrology technology*. The Hybrid metrology technology is part of our holistic metrology approach that utilizes different sources of information that can enhance the overall metrology performance. It combines data from different metrology toolsets in the fab together with Nova's optical metrology to provide improved performance above that of any individual toolset. Nova has been pioneering the hybrid concept in the past several years and has proven the value of the solution in multiple publications and technical papers.

- *X-ray Photoelectron Spectroscopy*. Our XPS systems measure the material composition, bonding states, and thicknesses of thin (<10nm) film stacks. Primary application is monitoring the transistor gates and 3D-NAND layer deposition in integrated circuits. Through XPS we have also gained expertise in charged particle optics technologies.

- *X-ray Fluorescence*. We have added XRF capability to our VeraFlex III+ XPS tool. The combination of XPS and XRF allows measurement of composition and thickness at greater depths than provided by XPS alone. Compared to conventional XRF systems, our vacuum-based XRF system offers superior detection of elements of low atomic number, and smaller measurement areas.

- *Lab to Fab* - Nova now has the experience, capability and know-how to transform traditional analytical laboratory instrumentation into high volume, high productivity production tools.

The measurement techniques used in our metrology products are unique and protected by several patents.

Throughout our history, we have been a technological and innovation leader, bringing unique and differentiated metrology technologies to the market. Our unique approach of coupling high end Hardware solutions with advanced software algorithmic set us apart from our competitors and enable us to increase our served markets and gain market share.

Through the acquisition of ReVera, Nova has gained strong positioning as a provider of X-ray technologies to semiconductor high volume manufacturing, and we believe we are the sole provider of XPS technology for semiconductor high volume manufacturing. Effective as of December 31, 2017, we merged ReVera with and into its parent company, our U.S. subsidiary, Nova Measuring Instruments, Inc.

Products

Our product portfolio includes a complete set of, integrated and stand-alone metrology platforms suited for dimensional, films and material metrology measurements for process control across multiple semiconductor manufacturing process steps including lithography, Etch, CMP and deposition. Our solutions utilize optical spectral reflectometry and X-ray technologies combined with advanced software modeling and unique algorithmic capabilities and address a broad range of metrology requirements of our end-user and process equipment manufacturer customers. Nova's fleet management platform addresses the need for high efficiency and productivity in the most advanced production lines of our customers, manages large fleets of metrology tools, and is designed to address the needs and working methodologies of metrology and process engineers in the fab. As part of our holistic view of metrology that extends to use more channels and sources of information available for optimizing the metrology solution performance, we also provide the hybrid metrology solution that combines data from different toolsets in the fab such as CD-SEM and X-ray together with Nova's optical metrology to provide improved performance above that of any individual toolset. Following is a summary of our main products:

- The Novai550 series is our most advanced integrated metrology product that enhances metrology performance by using newly designed optics enabling better sensitivity and accuracy while measuring the most complex structures. The i550 delivers a significant boost in productivity required in the most advanced production lines and supports new disruptive modeling that incorporate smart learning and training capabilities. The i550 platform is qualified with major process equipment vendors and is designed to meet the metrology and process control challenges of the most advanced FinFET and 3D-NAND in R&D and production.

- The Novai500 integrated metrology product family delivers advanced metrology with high throughput and tool matching performance. The platform is qualified with multiple process tools and is deployed in both R&D and high-volume production of the most advanced logic and memory technology nodes. The i500 platform provides unique capabilities of thick layer measurement (TLM), enabling solutions for applications requiring accurate, repetitive measurements of thick films, such as in CMOS image sensor BSI CMP applications.

- The NovaScan3090Next is a legacy system still sold into 300mm fabs as the latest and most advanced of the NovaScan line. Targeted for 45nm and 32nm technology nodes with extendibility down to 20nm, 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 NovaScan2040 is Nova's integrated thickness monitoring systems for 200mm fabs with enhanced spectral range, addressing the needs of the industry for chemical mechanical polishing high-end applications of thin films and complex layer stacks.

- The NovaPRISM is an Optical CD system targeted at the most complex device manufacturing across the frontend semiconductor segments. NovaPRISM combines revolutionary Spectral Interferometry (SI) technology, a powerful new capability for CD metrology, with state-of-the-art multi-channel optical technology to extract unique information from the measured device, inaccessible by traditional optical CD technics.

- The NovaMMSR (Multi-Measurement Spectral Reflectometry) enhances Nova's stand-alone metrology performance by adding unique channels of information to its newly designed optical unit. The platform is complemented with advanced algorithms for smart utilization of multiple channels to optimize more accurate and faster solutions. Nova T600MMSR is designed to meet the metrology and process control challenges for advanced FinFET, DRAM and 3D-NAND in R&D and production.

- The NovaT550 is a high-productivity dimensional metrology platform designed to address the unique challenges of the semiconductor manufacturing industry, delivering a highly efficient and effective solution for advanced nodes. With full commonality and same optics design as the Nova i550 integrated metrology platform, the Nova T550 completes Nova's unique and highly efficient offering for CMP metrology and process control.

- The NovaT500 is a high-productivity metrology platform that delivers increased sampling rates and high-performance film thickness and Optical CD metrology capabilities. The T500 platform provides unique capabilities of thick layer measurement (TLM), enabling solutions for applications requiring accurate, repetitive measurements of thick films, such as in CMOS image sensor BSI (Backside Illuminated Sensor) CMP applications.

- NovaFit is our data-driven modeling software engine that enhances traditional modeling capabilities with advanced machine learning algorithms. The NovaFit suite works in conjunction with NovaMARS® augmented modeling engine and Nova's Fleet management solution to improve metrology performance, speed up time to solution and expand metrology envelope for enriched process control. NovaFit embeds the most advanced machine learning and big data architecture into optical modeling, revolutionizing the way customers utilize metrology measurement data and expands the metrology performance envelope to tighten process windows, avoid process excursions and improve yield.

- NovaMARS is an advanced scatterometry modeling and application development software tool enabling complex 2D, 3D and in-die measurements as well as Real Time Regression (RTR) capabilities. 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 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, Nova's Optical CD tools provide 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.

- NovaFleet Management platform is Nova's solution for managing large fleets of metrology tools to deliver high productivity, operational efficiency and advanced analytics in high volume production environment of foundry and memory customers. The Fleet Management solution offers an easy and intuitive platform for managing and improving the overall productivity of Nova's fleet of systems and is designed to address the needs and working methodologies of metrology and process engineers in the fab.

- 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.

- The VeraFlex III+ XF is the most advanced, fourth generation version of the VeraFlex family of in-line XPS production metrology tools. It provides enhanced metrology performance, improved productivity, precision and sensitivity that extend the utilization of XPS technology in high volume production in the most advanced Logic and Memory technology nodes.

- The VeraFlex III XF is the third generation of the globally adopted VeraFlex series of XPS production systems. It combines enhanced XPS capability with a unique low energy XRF (LE-XRF) channel as an option to address the metrology challenges of the most advanced nodes. The VeraFlex III XF provides solutions for emerging applications in FinFET HKMG (High K Metal Gate), interconnect processes, and advanced memories.

- QED is the Offline Advanced Data Analysis and Recipe Creation and Maintenance System that supports VeraFlex III/+ XF. It brings the VeraFlex series engineering interface from the fab to the office. Built on PHI MultiPak's package of extensive XPS analysis function, QED brings all the tools necessary to manage the most effective film thickness and composition control recipes. QED functions include all aspects of film acquisition and analysis, a full suite of recipe creation and editing tools, and powerful signal analysis functions used to find and process the most critical elemental peaks.

Metrology is becoming a technology enabler that allows process equipment suppliers to tighten their specifications in order to meet customer's demand. Our strategy to offer holistic and diverse portfolio to enable the industry transitions, establishes the advantage and the value that innovative company like us brings to our customers and the market. With such a diversified portfolio, we now cover a variety of applications in both front end and back end of line that increases our served and available markets and footprint in all customer segments.

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, XPS and material metrology and include measurement instruments, algorithms, optical modeling, interpretation software, machine learning, image acquisition, pattern recognition, X-ray energy sources, electron optics and detection, vacuum systems and equipment integration. Our research and development staff consists of about 280 highly skilled members, approximately 70 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 in Israel are certified for ISO 9001 quality standard (Current ISO 9001:2015 version).

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.

Our vision is to continue to be a market leader in the semiconductor process control market, increase our leadership in integrated metrology solutions, increase our leadership in in-line composition and thickness of ultra-thin layers 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 enter into development consortium arrangements, which also help us to support our customers in the transition to advance technology nodes in the coming years. These consortiums are joint collaboration programs with other semiconductors companies, and are supported and funded by the IIA and\or European Joint Research. It should be noted, that in order to maintain our eligibility for these programs, we must continue to meet certain conditions. These programs might also restrict our ability to manufacture particular products and transfer particular technology, which were funded by the IIA. For additional information, see “Item 5C - Grants from the Israel Innovation Authority & European programs” in this annual report on Form 20-F.

As part of our long-term technological collaboration, we are also engaged with joint development activities with some of our strategic customers, as well as with research institutes and other semiconductor companies. These activities impose some limitations on the joint intellectual property developed as part of these programs.

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 December 31, 2019, our portfolio includes more than 160 U.S. patents and about 110 non-U.S. patents. The U.S. patents we hold have expiration dates ranging from 2019 to 2036. We also have about 40 U.S. patent applications pending and more than 100 patent and utility model applications pending in other countries including 5 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. In addition, our patents and applications principally cover various aspects of X-ray based measurement systems and methods, including process control implementation concepts, X-ray energy sources, electron optics and detection, vacuum systems and equipment integration. We have also registered 10 trademarks in the U.S. and have more than 50 registered trademarks and 19 applications for trademarks’ registration 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 (e.g. confidentiality agreements) and licenses. Our copyrights include software copyrights. We constantly 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.

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.

Our Customers, Sales and Marketing

Our sales and marketing strategy is based mostly on a direct approach where we engage with our customers from the early stages of process development, work in collaboration to address their challenges in the development phase and support the transition to high volume production. We 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 a global network of sales and marketing, customer service and applications support offices worldwide.

In addition, we have established sales and support activities with key process equipment manufacturers to ensure our products are combined into our partners’ next generation equipment sets as those become available. As part of our integrated tools sales effort, we continuously 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 serve all sectors of the integrated circuit manufacturing industry including logic, foundries and memory manufactures. Our end user and process equipment manufacturer customers are located in different 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:

	2017	2018	2019
	(US Dollars, in thousands)		
Taiwan, R.O.C.	$ 68,041	$ 62,460	$ 80,285
Korea	61,664	79,290	36,220
USA	38,254	20,082	26,390
China	36,715	58,982	56,378
Other	17,319	30,320	25,636
Total	221,992	251,134	224,909

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.

	2017	2018	2019
Total revenues from five largest customers	75%	66%	67%
Range of revenues from five largest customers	8%-23%	5%-20%	3%-27%

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 process control systems include technological leadership, system performance, ease of use, reliability, cost of ownership, technical support and customer relationships. An adequate business model, internal efficient and innovative organization and unique process equipment manufacturer agreements and partnerships are also significant factors. We believe we compete favorably based on these factors in the markets we serve.

Our current Optical and X-ray metrology products compete primarily with Onto Innovation (formerly Nanometrics and Rudolph technologies, who merged into one company in the second half of 2019) and KLA Corporation. In this area, we are using our broad portfolio of stand-alone metrology platforms combined with advanced modeling and software capabilities. These solutions are being used for in line metrology at leading foundries and memory customers. We see an increasing demand for high end metrology solutions that are coupling software and hardware, as customers move forward to advanced nodes.

In the films and material metrology field, we primarily compete with thin films metrology products manufactured by KLA.

We also compete against other companies which manufacture other types of equipment as a result of the disruptive nature of the technology we offer. These include companies such as Hitachi hi-tech, Applied Materials, and ASML and other process providers.

Manufacturing

We have one manufacturing facility for our Optical CD product lines, which is located in Ness-Ziona, Israel, divided into two buildings, and one manufacturing facility for our X-ray product line, which is located in Fremont, CA, US.

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 and in Fremont. 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.

In order to leverage the relatively high volume of the 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 and services in Israel 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 9001:2015 requirements. We received the formal certification of ISO 14001 in 2010 which was upgraded to ISO 14001:2015 in 2016 and in 2014 we received the formal certification of OHSAS 18001:2007 for our manufacturing operations in Israel which was upgraded to ISO 45001 in 2019. We are being annually recertified for these standards.

Capital Expenditures

Our capital expenditures are primarily for network infrastructure, computer hardware and software, leasehold improvements of our facilities, expansion of clean room 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.

Government Regulation

For information relating to the impact of certain government regulations on our business, see “Item 5.C – Grants from the Israel Innovation Authority” 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 Korea Ltd.	Korea
Nova Measuring Instruments GmbH	Germany

4.D Property, Plant and Equipment

Our main facilities, located in Rehovot and Ness-Ziona, Israel, occupy approximately 16,900 square meters, including: approximately 2,000 square meters of production facilities, approximately 5,700 square meters of research and development offices (including approximately 1,400 square meters of laboratories) and approximately 3,200 square meters of headquarters, sales and marketing, service and support and administration facilities.

In September 2019, our Israel headquarters moved to a new building at the Science Park in Rehovot. The current lease agreement is expected to extend for a period of ten years. We have the option to extend the lease period by two periods of five years each, subject to customary conditions. The lease period for an additional space of approximately 2,000 square meters, is expected to begin in 2021 and will extend through the same lease periods as the initial space.

Our current lease agreement for the facilities in Ness Ziona (which was amended in May 2016 to include additional space required for our operations) is until January 31, 2026 (with a right, at Nova's sole discretion, to terminate the agreement on January 31, 2021, upon a 180-day prior notice). The manufacturing facility for Optical CD product lines and several R&D laboratories are expected to remain at the same location in Ness-Ziona, which lease' term extends until 2026. The lease agreement for approximately 4,300 square meters of offices in Ness Ziona, out of which the company moved out, is expected to terminate on January 31, 2021.

Our subsidiaries lease offices in various locations, for use as a research and development, manufacturing, service and pre-sale facility (depending on each subsidiary's needs). During 2019, our U.S. subsidiary, Nova Measuring Instruments, Inc. has moved into approximately 3,800 square meters of a newly leased space, which includes approximately 850 square meters of production facilities. This facility lease will expire on March 31, 2026 (with, at Nova Measuring Instruments, Inc.'s sole discretion, a right to extend the lease period for an additional five years). Our Japanese subsidiary leases approximately 90 square meters, our Taiwanese subsidiary leases approximately 1,025 square meters and our Korean subsidiary leases approximately 1,060 square meters. Our European subsidiary leases approximately 200 square meters in Germany and France.

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 metrology systems for the semiconductor manufacturing 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 manufacturing equipment. We market and sell our metrology systems mainly to semiconductor manufacturers, and in some cases to semiconductor process equipment manufacturers.

Our business is greatly affected by the level of spending on capital equipment by semiconductor manufacturers. In addition, demand for our products and services is affected by the timing of new IC capacity expansion and ramping up of new technology nodes, by the timing of releasing products 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 (2014-2019), we were able to present positive Compound Annual Growth Rate (CAGR) of products revenues of approximately 13%, while Gartner Inc. estimates that the Wafer Fab Equipment ("WFE") segment have experienced a CAGR of approximately 10%. We believe that our improved performance is attributed mainly to our continued diversification in revenue contribution. We successfully diversified our technology to include X-ray capabilities on top of our Optical technology to measure both Dimensional and Material parameters, we added advanced machine learning algorithms on top of our physical modeling and we advanced our traditional tool set to include the most advanced capabilities in both hardware and software. We also diversified our revenue mix to include approximately 50% contribution from Memory, including the leading Memory providers' customers. We also invested successfully in diversify our geography mix with Taiwan, Korea and China contributing the majority of revenues. During these years, we were able to increase our total available market with new applications for Materials and Dimensions metrology in both the Memory and Foundry segments. During 2019, we continued with our goals to diversify our activities with the introduction new generation tools as well as new applications that require advanced coupling of Materials and Dimensional metrology as well as SW and HW capabilities. We continued also to expand our market with new penetrations to new applications in our served market.

In 2019, product sales accounted for approximately 74% of our total revenues, and services accounted for approximately 26%.

Presently, we have no significant long-term debt (except liabilities related to the implementation of the new ASC 842 of lease accounting starting January 1st, 2019), and during 2019 our overall cash reserves increased by approximately $13.3 million. As of the end of 2019, we had overall cash reserves of approximately $191.1 million and working capital of approximately $256.0 million.

Our service organization is operating 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.

Significant Events in 2019 and Outlook for 2020

During 2019, we demonstrated several significant achievements:

- Balanced geography distribution that yielded three large territories, each contributing more than 20% to our total products revenue – China, Korea and Taiwan.
- Diversified customer mix, including 3 major customers accounting for 10% or more of products' revenues.
- Balanced revenue mix between Memory and Foundry.
- Further market adoption of Nova's advanced portfolio by leading wafer fabrication customers:
  - Hardware and Software coupling
  - Unique Optical and X-ray solutions
  - Holistic offering, including Integrated and Standalone metrology
- Continued investments in research and development programs aimed to generate new organic growth engines.
- Introduction of several new generation Dimensional and Materials metrology platforms. We also continued rolling out Machine Learning mathematical algorithms to enhance metrology measurements and to complement the traditional Physical modeling.
- Deepening collaboration with several research institutes, process vendors and customers' technology development centers, utilizing a variety of our products, leading to our positioning as a long-term technology development and high-volume manufacturing partner.

In 2020, we plan to focus on the following:

- Continue to strengthen our competitive and market position, through unique innovation and technical leadership.
- Continue our aggressive innovation and development plans for meeting future industry challenges in both the memory and foundry segments.
- Expand our total available market by addressing new emerging metrology applications and market segments, through solutions delivery to the challenging buildup of advanced Logic technology nodes, memory scaled VNAND nodes and DRAM scaled devices at leading edge customers.
- Continue delivery of advanced metrology systems to the trailing edge technology nodes to support new applications ramp up.

- Continue our progress to meet Nova's long-term strategic plan, which defines the Company's growth path in revenue, customers, technology and financial performance, to support our profitable growth.

- Continue leading the emerging metrology markets with innovative and disruptive solutions.

- Continue the collaborations and joint research programs with leading semiconductor manufacturers and relevant leading research institutes.

- Continue our products innovation and diversification through several new product introductions to extend the Company's market leadership and total available market.

- Continue our aggressive plans to generate revenues and competitive edge through SW algorithm products.

- Strengthening the partnership with our customers and build a "Customer Centric" approach to accommodate and deliver customers' requirements along the semiconductor lifecycle.

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

- On time delivery of the required process control solutions to meet the current and future 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, innovative and competitive roadmap deliverables at reasonable costs in order to properly control expenses.

- Identifying the metrology evolution for future industry needs to meet process control requirements and lead the market.

- Achieving long-term growth targets while supporting global extensive growth in all our activities.

- Building a solid company infrastructure to accommodate further growth.

In order to address these risks and challenges, we are working closely with leading customers' development and research 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 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.

It is our belief that we have been able to consistently improve our market position as a result of a combination of factors:

- Optical metrology has become an enabler for the entire industry over the last few years, sometimes on the account of other metrology capabilities.

- Material Metrology has been widely adopted by leading memory and foundry customers for complex materials composition and film thickness applications.

- Nova’s unique metrology portfolio, combining Optical and X-ray metrology for both dimensions and materials, provide the most advanced solution, combining the best innovative and technical metrology capabilities with the best cost of ownership.

- The ability to provide a unique and differentiated technology portfolio sets us apart from the competition and adding a competitive edge to our offering.

- Our solutions are well accepted by leading customers that allow us to gain more market share with additional process steps and new applications.

- Our ability to closely team with our customers allows us to predict the industry evolution and process control challenges and by that introduce innovative and advanced metrology solutions to solve industry needs.

- Our diversified portfolio, which is a result of continuous investment in research and development, is becoming more attractive to our customers.

- Widening our solutions’ base to include hardware and software elements in a coupled offering.

- Well controlled P&L and operating model to support our profitable growth plans.

Understanding the industry’s challenges for the next several years, it is our belief that we should continue our long-term growth as the adoption of our solutions increases as a function of process complexity and industry development. We believe that our served addressable market is continuously expanding as we penetrate to more steps of the semiconductor manufacturing processes and, as we continue innovating our portfolio for leading new emerging metrology opportunities. We also believe that going forward, as the semiconductor process is becoming much more complicated with variety of challenges, the necessity for our unique portfolio, combining multiple technologies for both Materials and Dimensional metrology, will grow in the next few years.

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 principles 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. Our management evaluates its estimates on an ongoing basis, including those related to, but not limited to income taxes and tax uncertainties, collectability of accounts receivable, inventory accruals, fair value and useful lives of intangible assets, and revenue recognition. These estimates are based on management's knowledge about current events and expectations about actions the Company may undertake in the future. Actual results could differ from those estimates.

Revenue Recognition

Under ASC 606, the company derives revenue from the sales of advanced process control systems, spare parts, labor hours (mainly systems installation) and service contracts.

Revenues derived from sales of advanced process control systems, spare parts and labor hour are recognized at point in time, when control of the promised goods or services is transferred to the customers, upon fulfillment of the contractual terms.

Revenues derived from service contract, which generally specify fixed payment amounts and contractual terms for periods longer than one month, are recognized ratably over time.

The amount recognized reflects the consideration that the Company expects to be entitled to in exchange for those performance obligations.

Revenues from sales which were not yet determined to be final sales due to acceptance provisions are deferred.

Contracts with customers may include multiple performance obligations. For such arrangements, the Company allocates revenue to each performance obligation based on its relative Standalone Selling Price ("SSP"). Judgment is required to determine the SSP for each distinct performance obligation. The Company uses a range of amounts to estimate SSP when it sells each of the products and services separately and needs to determine whether there is a discount to be allocated based on the relative SSP of the various products and services.

The Company enters into revenue arrangements that includes products and services which are generally distinct and accounted for as separate performance obligations. The Company determines whether arrangements are distinct based on whether the customer can benefit from the product or service on its own or together with other resources that are readily available and whether the Company's commitment to transfer the product or service to the customer is separately identifiable from other obligations in the contract.

Inventories Write-Off

We carry our inventory at the lower of either the actual cost or the net realizable 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 twenty-four months. As demonstrated in the past, 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.

Goodwill

Goodwill and other purchased intangible assets have been recorded as a result of the acquisition of ReVera. Goodwill represents the excess of the purchase price in a business combination over the fair value of net tangible and intangible assets acquired, and related liabilities. Goodwill amount on December 31, 2019 was $20.1 million.

Goodwill is not amortized, but rather is subject to an impairment test. In accordance with ASC 350, “Intangibles – Goodwill and Other”, at least annually (in the fourth quarter), or more frequently if events or changes in circumstances indicate that the carrying value may be impaired. The Company has an option to perform a qualitative assessment to determine whether it is more-likely-than-not that the fair value of a reporting unit is less than its carrying value prior to performing the quantitative goodwill impairment test. The Company operates in one operating segment, and this segment comprises its only reporting unit.

Following the adoption of ASU 2017-04, "Simplifying the Test for Goodwill Impairment", as part of the quantitative goodwill impairment test, any excess of the carrying value of the reporting unit over its fair value is recognized as an impairment loss, and the carrying value of goodwill is written down to the fair value of the reporting unit. For the year ended December 31, 2019, we performed an annual impairment analysis, using market capitalization, and no impairment losses have been identified.

Intangible assets

As a result of the acquisition of ReVera in April 2015, our balance sheet included acquired intangible assets, in the aggregate amount of approximately $10.2 million and $7.6 million as of December 31, 2018 and 2019, respectively.

In 2015, we allocated the purchase price of ReVera to the tangible and intangible assets acquired and liabilities assumed, based on their estimated fair values. These valuations require management to make significant estimations and assumptions, especially with respect to intangible assets. Critical estimates in valuing intangible assets include future expected cash flows from technology acquired, backlog and customer relationships. Management’s estimates of fair value are based on assumptions believed to be reasonable, but which are inherently uncertain and unpredictable.

Intangible assets are comprised of acquired technology, customer relations, backlog and IP R&D.

During 2018 and 2019, no impairment charges were identified.

Accounting for income tax

We are subject to income taxes in Israel, the United States and numerous foreign jurisdictions. Significant judgment is required in evaluating our uncertain tax positions and determining our taxes. Although we believe our reserves are reasonable, no assurance can be given that the final tax outcome of these matters will not be different from that which is reflected in our historical income tax provisions and accruals. We adjust these reserves in light of changing facts and circumstances, such as the closing of a tax audit or the refinement of an estimate. To the extent that the final tax outcome of these matters is different than the amounts recorded, such differences will affect the provision for income taxes in the period in which such determination is made.

We have accounted for the tax effects of the Tax Cuts and Jobs Act, which we refer to as the Tax Act, enacted on December 22, 2017, on a provisional basis. Our accounting for certain income tax effects include reasonable estimates for those effects, which are included in our financial statements as of December 31, 2019.

Significant judgment is also required in determining any valuation allowance recorded against deferred tax assets. In assessing the need for a valuation allowance, we consider all available evidence, including past operating results, estimates of future taxable income, and the feasibility of tax planning strategies. In the event that we change our determination as to the amount of deferred tax assets that can be realized, we will adjust our valuation allowance with a corresponding impact to the provision for income taxes in the period in which such determination is made.

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.

New Accounting Pronouncements

For information regarding new accounting pronouncements, see Note 2W to our consolidated financial statements contained elsewhere in this annual report.

5.A Operating Results

Overview

The table below describes the distribution of our total revenues, from products and services, by geographic areas of our product installations at semiconductor manufacturing facilities.

	2017	2018	2019
Taiwan, R.O.C.	31%	25%	36%
USA	17%	8%	16%
Korea	28%	32%	12%
China	17%	23%	25%
Other	8%	12%	11%
Total	100%	100%	100%

Historically, a substantial portion of our revenues has come from a small number of customers, and we anticipate that our revenues will continue to depend on a limited number of major customers.

The sales cycle for our systems typically ranges from six (6) to twelve (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 2019, our inventory levels at the end of each quarter ranged from $45.6 million to $50.1 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 10.4% in 2019 following an increase of 13% in 2018, and an increase of 35% in 2017.

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

	Percentage of Total Revenues		
	Year ended December 31,		
	2017	2018	2019
Revenues from product sales	78.5%	77.0%	74.3%
Revenues from services	21.5%	23.0%	25.7%
Total revenues	100%	100%	100%
Cost of products sale	28.0%	28.6%	29.9%
Cost of services	12.9%	13.6%	15.9%
Expense related to settlement of IIA grants	-	-%	-
Total cost of revenues	40.9%	42.2%	45.8%
Gross profit	59.1%	57.8%	54.2%
Operating expenses:			
Research and development expenses, net	17.5%	18.1%	19.8%
Sales and marketing expenses	11.1%	11.5%	12.9%
General and administrative expenses	3.6%	3.5%	4.5%
Amortization of intangible assets	1.2%	0.7%	0.8%
Total operating expenses	33.0%	33.8%	38%
Operating profit	26.0%	24.1%	16.2%
Financial income, net	1.0%	1.2%	1.4%
Income before income taxes	27.1%	25.3%	17.6%
Income tax expenses	6.1%	3.6%	1.9%
Net income	20.9%	21.7%	15.6%

Comparison of Years Ended December 31, 2019 and 2018

Revenues. Our revenues in 2019 decreased by $26.2 million, or 10.4%, compared to 2018. Revenues attributable to product sales were $167.2 million, a decrease of $26.1 million, or 13.5%, compared to 2018. Revenues attributable to services were $57.7 million, a decrease of $0.1 million, or 0.2%, compared to 2018. The decrease in product revenues in 2019 was attributed to both OCD and XPS products, due to the decrease in WFE investments in 2019.

Cost of Revenues and Gross Profit. Cost of revenues consists of labor, material and overhead costs of manufacturing our systems, royalties, 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 2019 was $67.3 million. Our gross margin attributable to product revenues in 2019 was 59.7%, compared to 62.9% in 2018. The decrease in products gross margins in 2019 is related mainly to the decrease in sales and to a different product mix including transition to new product generations which are bearing higher costs..

Our cost of services in 2019 was $35.8 million, relative to $34.2 million in 2018. Gross margin attributable to service revenues in 2019 was 38.0%, compared to 40.9% in 2018. The decrease in services gross margins in 2019 is related mainly to the higher personnel costs in that year.

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 IIA and the European Community, as well as other funding for research and development activities. Our net research and development expenses in 2019 were $44.5 million, a decrease of $0.9 million, or 2.1%, compared to 2018, after offsetting grants received of $6.9 million in 2019 and $5.8 million in 2018. Research and development expenses excluding grants received or receivable in 2019 were $51.4 million, compared to $51.2 million in 2018. In 2019, net research and development expenses represented 19.8% of our revenues, compared to 18.1% of our revenues in 2018.

Sales and Marketing Expenses. Sales and marketing expenses are mainly comprised of salaries and related costs for sales and marketing personnel, travel related expenses, overhead and commissions to our representatives and sales personnel. Starting 2015, sales and marketing expenses also include amortization of intangibles related to customer relations. Our sales and marketing expenses in 2019 were $29.1 million, an increase of $0.2 million, or 0.8%, compared to 2018. The increase in sales and marketing expenses in 2019 was mainly attributed to increase in marketing costs related to systems evaluation processes by customers. Sales and marketing expenses represented 12.9 % our revenues in 2019 compared to 11.5% of our revenues in 2018.

Amortization of Intangible Assets. As part of the acquisition of ReVera on April 2, 2015, the company acquired $12.3 million of intangible asset related to technology. In both 2019 and 2018, the company recorded $1.8 million of amortization of intangible assets.

General and Administrative Expenses. 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 in 2019 were $10.1 million, an increase of $1.3 million, or 15.2%, compared to 2018. The increase in general and administration expenses was attributed mainly to new facilities related costs. In 2019, general and administration expenses represented 4.5% of our revenues, compared to 3.5% of our revenues in 2018.

Income Tax Expenses. Income tax expenses are comprised of current tax expenses and deferred tax expenses/income. In 2019, we recorded $4.3 million of income tax expenses, reflecting effective tax rate of 10.9 %. In 2018, we recorded $9.1 million of income tax expenses, reflecting effective tax rate of 14.3%. The decrease in the effective tax rate in 2019 is attributed mainly to US territory tax benefits, including benefits related to US Tax Cuts and Jobs Act.

Comparison of Years Ended December 31, 2018 and 2017

Revenues. Our revenues in 2018 increased by $29.1 million, or 13.1%, compared to 2017. Revenues attributable to product sales were $193.3 million, an increase of $19.0 million, or 10.9%, compared to 2017. Revenues attributable to services were $57.8 million, an increase of $10.2 million, or 21.4%, compared to 2017. The increase in product revenues in 2018 was attributed to XPS products. The increase in services revenues is attributed mainly to higher time and materials revenues, as a result of the higher installed base of systems.

Cost of Revenues and Gross Profit. Cost of revenues consists of labor, material and overhead costs of manufacturing our systems, royalties, 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 2018 was $71.7 million. Our gross margin attributable to product revenues in 2018 was 62.9%, compared to 64.3% in 2017. The decrease in products gross margins in 2018 is related to the decrease in software sales which have a higher gross margin.

Our cost of services in 2018 was $34.2 million, relative to $28.6 million in 2017. Gross margin attributable to service revenues in 2018 was 40.9%, compared to 40.1% in 2017.

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 IIA and the European Community. Our net research and development expenses in 2018 were $45.5 million, an increase of $6.5 million, or 16.7%, compared to 2017, after offsetting grants received of $5.8 million in 2018 and $4.6 million in 2017. Research and development expenses excluding grants received or receivable in 2018 were $51.2 million, compared to $43.6 million in 2017. In 2018, net research and development expenses represented 18.1% of our revenues, compared to 17.5% of our revenues in 2017. The increase in research and development expenses in 2018 is mainly related to the investments in new technologies, which are aimed to expand our addressable markets, towards their market introduction in 2019-2020.

Sales and Marketing Expenses. Sales and marketing expenses are mainly comprised of salaries and related costs for sales and marketing personnel, travel related expenses, overhead and commissions to our representatives and sales personnel. Starting 2015, sales and marketing expenses also include amortization of intangibles related to customer relations. Our sales and marketing expenses in 2018 were $28.8 million, an increase of $4.3 million, or 17.5%, compared to 2017. The increase in sales and marketing expenses in 2018 was mainly attributed to an increase in headcount and related labor costs of sales and marketing personnel and commissions. Sales and marketing expenses represented 11.5% our revenues in 2018 compared to 11.1% of our revenues in 2017.

Amortization of Intangible Assets. As part of the acquisition of ReVera on April 2, 2015, the company acquired $12.3 million of intangible asset related to technology. In both 2018 and 2017, the company recorded $1.8 million of amortization of intangible assets.

General and Administrative Expenses. 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 in 2018 were $8.7 million, an increase of $0.6 million, or 7.8%, compared to 2017. The increase in general and administration expenses was attributed mainly to the increase in headcount related labor costs. In 2018, general and administration expenses represented 3.5% of our revenues, compared to 3.6% of our revenues in 2017.

Income Tax Expenses. Income tax expenses are comprised of current tax expenses and deferred tax expenses/income. In 2018, we recorded $9.1 million of income tax expenses, reflecting effective tax rate of 14.3%. In 2017, we recorded $13.6 million of income tax expenses, reflecting effective tax rate of 21%. The decrease in the effective tax rate in 2018 is attributed mainly to tax benefits related to US Tax Cuts and Jobs Act.

5.B Liquidity and Capital Resources

As of December 31, 2019, we had working capital of approximately $256.0 million compared to working capital of approximately $233.5 million as of December 31, 2018. The increase in our working capital is related mainly to our fluent profits and cash flow.

Cash and cash equivalents, short-term and long-term deposits as of December 31, 2019 were $191.1 million compared to $177.8 million as of December 31, 2018.

Trade accounts receivables decreased from $53.5 million as of December 31, 2018 to $51.6 million as of December 31, 2019.

Inventories increased from $41.8 million as of December 31, 2018 to $48.4 million as of December 31, 2019. The increase in inventory is related mainly to the introduction of new products and to the increase in our global inventories related to services.

Operating activities in 2019 generated positive cash flow from operating activities of $41.2 million compared to a positive cash flow from operating activities of $36.1 million in 2018. The increase in operating cash flow in 2019 is mainly related to effective collection of accounts receivables in 2019 relative to 2018.

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

	2017		2018		2019	
	Domestic	Abroad	Domestic	Abroad	Domestic	Abroad
	(US dollars, in thousands)					
Electronic equipment	2,320	177	2,400	237	3,975	418
Office furniture and equipment	141	105	21	19	2,192	604
Leasehold improvements	3,488	64	493	508	11,231	2,849
Total	**5,949**	**346**	**2,914**	**764**	**17,398**	**3,871**

In 2019, the investment in capital expenditures was financed from our fluent operating cash flow, and included major investments in leasehold improvements in our new facilities in Israel and the US. In 2020, we expect to reduce our capital spending, to approximately $10 million.

Our principal liquidity requirement is expected to be for working capital and capital expenditures as well as additional acquisitions. We believe that our current cash reserves will be adequate to fund our planned activities for at least the next twelve 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 would 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.

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 Israeli Innovation Authority & European Programs

IIA sponsoring for generic research and development projects of large Israeli companies

We participate in a generic research and development programs sponsored by the IIA, available for Israeli companies that meet specific criteria’s set forth by the IIA. Companies eligible to participate in this program receive IIA funding intended to focus on long-term creation of know-how and technological infrastructure, used for the development or production of future innovative products. These programs do not require payments of royalties to the IIA, but all other restrictions under the Innovation Law, such as local manufacturing obligations and know-how transfer limitations, as further detailed hereunder, are applicable to the know how developed by us with the funding received in such program.

IIA sponsoring for Israeli research and development consortiums

In 2019 and 2018, and in previous years, we participated in a consortium program sponsored by IIA. Under the terms of this program, we cooperate with additional companies and research institutes in Israel, organized in a consortium for the development of new technologies. The rules of the consortium include several references to the distribution of knowledge between the consortium members, requires us to provide the other members in the consortium with a non-sub-licensable license to use the “new information” developed by such member, without consideration. These programs do not require payments of royalties to the IIA, but all other restrictions under the Innovation Law, such as local manufacturing obligations and know-how transfer limitations, as further detailed hereunder, are applicable to the know how developed by us with the funding received in such program.

Joint programs of the European Research Area and the IIA

We participate in European consortiums, which are joint programs governed by the Electronic Component Systems for European Leadership Joint Undertaking (the “JU”) as part of the Horizon 2020 cooperation between the European Research Area and the IIA (the “EU Consortiums”).

Some of the obligations and undertakings specified hereunder in connection with our IIA activities (such as the restrictions under the Innovation Law and obligation to grant certain access rights to our technology and intellectual property rights) apply with respect to these joint projects. In addition, the participation in an EU Consortium includes specific obligations, such as the following: The budgeted grant will be paid to the company pursuant to certain rules regarding ‘eligible costs’; Obligation to properly implement the activities assigned under the specific EU Consortium project; Restrictions in contributions of third parties (by service or otherwise); Obligation to keep information up to date and to inform about events and circumstances likely to affect the consortium activity; Obligations related to records keeping, investigations and audits by the JU in order to verify the proper implementation of the specific EU Consortium project and compliance with the obligations under the terms of the program, including assessing deliverables and reports during a period of up to two years following the receipt by the company of the full grant payment; Obligations related to Intellectual property allocation generated by an EU Consortium, background intellectual property designation prior to the commencement of the EU Consortium’s project and the provision of access rights to results obtained as part of the EU Consortium. Breach of such obligations may result in the reduction of the aggregate expected grant amount or claiming back previously received grants. In addition, the company may be subject to administrative and financial penalties such as temporary exclusion from all JU European Consortiums and fines of up to 10% of the maximum expected grant, as well as to contractual liabilities.

Past royalty bearing programs and royalties arrangements

Some of our previous research and development efforts were financed in part through royalty-bearing grants. We were obligated to pay royalties of 5% in 2016 and 2015 and in previous years, of revenues derived from sales of products funded with these grants. This obligation included different annual interest rates ranging up to 5%. In August 2016, we entered into a royalty buyout arrangement, or the Arrangement, with the IIA. As part of the Arrangement we paid approximately $12.9 million to the IIA in September 2016. The contingent net royalty liability to the IIA at the time we executed the Arrangement was approximately $24 million. As a result of the foregoing payment, we are released from any future royalty payments on these previous funds received from the IIA. However, to the extent that we will be able to commercialize products that were developed as part of IIA programs and were declared as "failed" at the time of the Arrangement, we will be required to pay royalties to the IIA from income generated from such commercialization. Currently, we do not anticipate that such failed projects will generate revenues in the future. We note that the Arrangement does not release the Company from other obligations towards the IIA as further detailed herein. See also Note 8A to our consolidated financial statements contained elsewhere in this report. In addition, in the future, we may, alone or together with third parties, participate in research and development programs, which may bear royalty obligations (depending on the specific terms of the applicable program).

Pertinent obligations under the Israeli Encouragement of Research, Development and Technological Innovation in the Industry Law 1984

Under the Encouragement of Research, Development and Technological Innovation in the Industry Law 1984 and the provisions of the applicable regulations, rules, procedures and benefit tracks, together the Innovation Law, a qualifying research and development program is typically eligible for grants of up to 50% of the program's pre-approved research and development expenses. The program must be approved by a committee of the IIA. 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 whole or in part) under IIA program up to the total amount of the grants received from IIA, linked to the U.S. dollar and bearing annual interest (as determined in the Innovation Law). Following the full payment of such royalties and interest, there is generally no further liability for royalty payment for our currently developed and sold products. Nonetheless, the restrictions under the Innovation Law (as generally specified below) will continue to apply even after our company has repaid the grants, including accrued interest, in full.

The main pertinent obligations under the Innovation Law are as follows:

- *Local Manufacturing Obligation*. The terms of the grants under the Innovation Law require that we manufacture the products developed with these grants in Israel. Under the regulations promulgated under the Innovation Law, the products may be manufactured outside Israel by us or by another entity only if prior approval is received from the IIA (such approval is not required for the transfer of less than 10% of the manufacturing capacity in the aggregate, as declared to be manufactured out of Israel in the applications for funding, in which case a notice should be provided to the IIA). This approval may be given only if we abide by all the provisions of the Innovation Law and related regulations. Ordinarily, as a condition to obtaining approval to manufacture outside Israel, we would be required to pay royalties at an increased rate (usually 1% in addition to the standard rate and increased royalties cap 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 the IIA grant application an intention to exercise a portion of the manufacturing capacity abroad, thus, if the grant application is approved by IIA, such company will avoid the need to obtain additional approvals and pay the increased royalties cap for manufacturing outside of Israel at portions which were mentioned in such approved grant applications.

- *Know-How transfer limitation*. The Innovation Law restricts the ability to transfer know-how funded by the IIA outside of Israel, including by way of a license to a non-Israeli entity. Transfer of IIA funded know-how outside of Israel requires prior approval of the IIA. The IIA approval to transfer know-how created, in whole or in part, in connection with an IIA-funded project to third party outside Israel is subject to payment of a redemption fee to the IIA calculated according to a formula provided under the Innovation Law that is based, in general, on the ratio between the aggregate IIA grants to the company's aggregate investments in the project that was funded by these IIA grants, multiplied by the transaction consideration, taking into account depreciation mechanism, and less royalties already paid to the IIA The regulations promulgated under the Innovation Law establish a maximum payment of the redemption fee paid to the IIA under the above mentioned formulas and differentiates between two situations: (i) in the event that the company sells its IIA 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 will be no more than six times the total grants received (plus accrued interest) for development of the know-how being transferred, or the entire amount received from the IIA, as applicable; (ii) in the event that following the transactions described above (i.e., asset sale of IIA funded know-how or transfer as part of an M&A transaction) the company undertakes to continue its R&D activity in Israel (for at least three years following such transfer and maintain at least 75% of its R&D staff employees it had for the six months before the know-how was transferred, while keeping the same scope of employment for such R&D staff), then the company is eligible for a reduced cap of the redemption fee of no more than three times the amounts received (plus accrued interest) for the applicable know-how being transferred, or the entire amount received from the IIA, as applicable. No assurance can be given that approval to any such transfer, if requested, will be granted and what will be the amount of the redemption fee payable.

  Approval of the transfer of IIA funded technology to another Israeli company requires a pre-approval by IIA and may be granted only if the recipient undertakes to fulfil all the liabilities to IIA and undertakes abides by all the provisions of the Innovation law and related regulations, including the restrictions on the transfer of know-how and manufacturing rights outside of Israel and the obligation to pay royalties. In light of the Arrangement (as further discussed below), in certain circumstances, under such sale transactions (i.e., the transfer of IIA funded technology or portion thereof to another Israeli company), we might be obligated to pay royalties to the IIA from any income derived from such a sale transaction.

- *Licensing arrangements*. Under the terms of the Innovation Law, licensing know how developed under the IIA programs outside of Israel, requires prior consent of IIA and payment of license fees to IIA, calculated in accordance with the licensing rules promulgated under the Innovation Law. The payment of the license fees does not discharge the company from the obligation to pay royalties or other payments due to IIA in accordance with Innovation Law.

These restrictions may impair our ability to enter into agreements for those products or technologies which were developed with assistance of the IIA grants without the approval of the IIA. We cannot be certain that any approval of the IIA will be obtained on terms that are acceptable to us, or at all. Furthermore, in the event that we undertake a transaction involving the transfer to a non-Israeli entity of know-how developed with IIA funding pursuant to a merger or similar transaction, the consideration available to our shareholders may be reduced by the amounts we are required to pay to the IIA. Any approval, if given, will generally be subject to additional financial obligations. Failure to comply with the requirements under the Innovation Law may subject us to mandatory repayment of grants received by us (together with interest and penalties), as well as may expose us to criminal proceedings. In addition, IIA may from time to time audit sales of products which it claims incorporate technology funded via IIA programs and this may lead to additional royalties being payable on additional products.

5.D Trend Information

For Information regarding most significant recent trends in our market, see “Item 4B– Our Market – The World Economy – Update” in this annual report on Form 20-F.

5.E Off-Balance Sheet Arrangements

We do not have and are not party to any off-balance sheet arrangements.

5.F Tabular Disclosure of Contractual Obligations

As of December 31, 2019, we had contractual obligations as described in the following table:

	Payment due by Period (US Dollars, in $ thousands)				
	Total	**Less than 1 year**	**1-3 years**	**3-5 years**	**More than 5 years**
Purchase Obligations	16,406	15,852	544	6	4

Item 6. Directors, Senior Management and Employees

6.A Directors and Senior Management

The following is the list of senior management and directors as of February 14, 2020:

Name	Age	Position
Michael Brunstein (3)	76	Chairman of the Board of Directors
Avi Cohen (1)	66	Director
Raanan Cohen (2)	64	Director
Zehava Simon (1)(2)(3)	61	Director (External Director until May 2018)
Dafna Gruber (1)(2)	54	Director (External Director until May 2018)
Ronnie (Miron) Kenneth (2)(3)	63	Director
Eitan Oppenhaim	54	Director, President and Chief Executive Officer
Dror David	50	Chief Financial Officer
Shay Wolfling	48	Chief Technology Officer
Gabriel Waisman	49	Chief Business Officer
Adrian S. Wilson	48	President of US subsidiary & General Manager Material Metrology Division
Gabi Sharon	58	Corporate Vice President Operations
Sharon Dayan	47	Chief Human Resources Officer
Zohar Gil	53	Corporate Vice President Marketing and Business Development
Effi Aboody	49	Corporate VP and General Manager Dimensional Metrology Division

(1) Member of the audit committee

(2) Member of the compensation committee

(3) Member of the Nominating committee

Dr. Michael Brunstein was named chairman of our board of directors in June 2006, after serving as member of our board of directors from November 2003. During the years 1990 and 1999, Dr. Brunstein served as Managing Director of Applied Materials Israel Ltd. Prior to that, Dr. Brunstein served as President of Opal Inc., and as a Director of New Business Development in Optrotech Ltd. Dr. Brunstein holds a B.Sc. in Mathematics and Physics from The Hebrew University, Jerusalem, and a M.Sc. and a Ph.D. in Physics from Tel Aviv University, Israel.

Mr. Avi Cohen has served as a director of the Company since 2008. From July 2016 to September 2017 Mr. Cohen served as the Chief Executive Officer of MX1, a global media service provider founded in July 2016 as a result of a merger between RR Media Ltd., and SES Platform Services GmbH. From July 2012 and until its merger with SES Platform Services GmbH, Mr. Cohen served as the chief executive officer of RR Media Ltd. (previously known as RRsat Global Communications Network Ltd.), which was a public company traded on Nasdaq. Prior to that, until March 2012, Mr. Cohen served as President and Chief Executive Officer of Orbit Technologies, a public company traded on the TASE. Prior to joining Orbit in December 2008, Mr. Cohen served as Chief Operating Officer and Deputy to the chief executive officer of ECI Telecom Ltd. a leading supplier of best-in-class networking infrastructure equipment for carrier and service provider networks worldwide. Prior to joining ECI in September 2006, Mr. Cohen served in a variety of management positions at KLA-Tencor. From 2003 Mr. Avi Cohen was a Group Vice President, Corporate Officer and Member of the Executive Management Committee based at the corporate headquarters in the U.S. During his tenure, he successfully led the creation of KLA-Tencor’s global Metrology Group. From 1995 he was the President of KLA-Tencor Israel responsible for the Optical Metrology Division. Before joining KLA-Tencor, Mr. Cohen also spent three years as Managing Director of Octel Communications, Israel, after serving as Chief Executive Officer of Allegro Intelligent Systems, which he founded and which was acquired by Octel. Mr. Cohen is currently a Director of BioFishency Ltd. ESC-BAZ Ltd., Beit Issie Shapiro, Israel Consumer Council and Israel Wine Institute. Mr. Cohen holds B.Sc. and M.Sc. degrees in electrical engineering and applied physics from Case Western Reserve University, USA.

Mr. Raanan Cohen was appointed as a director of the Company by our board of directors in February 2014. Prior to that and until December 2012, Mr. Cohen has served as the President and Chief Executive Officer of Orbotech Ltd., a public company traded on Nasdaq. Mr. Cohen has also served in a range of other executive positions at Orbotech Ltd, including Co-President for Business and Strategy, EVP and President of the Printed Circuit Board (PCB) Division, Vice President for the PCB-AOI product line and President and chief executive officer of Orbotech, Inc. Prior to its merger with Orbotech in 1991, Mr. Cohen held various positions at Orbot, another manufacturer of AOI systems. Prior to joining Orbot in 1984, he worked at Telrad Networks Ltd. Mr. Cohen currently serves as the Chief Executive Officer of EyeWay Vision Ltd., a private company. Mr. Cohen holds a B.Sc. in Computer Science from the Hebrew University in Jerusalem, Israel.

Ms. Zehava Simon was elected as the Company's external director in accordance with the provisions of the Companies Law in June 2014 and reelected in June 2017. Effective as of May 2018, and our adoption of the exemption under the Regulation (as defined below), Ms. Simon is no longer classified as an external director under the Companies Law. Ms. Simon served as a Vice President of BMC Software from 2000 until 2013 and in her last position (as of 2011) acted as Vice President of Corporate Development. From 2002 to 2011, Ms. Simon served as Vice President and General Manager of BMC Software in Israel. In this role, she was responsible for directing operations in Israel and India as well as offshore sites. Prior to that, Ms. Simon held various positions at Intel Israel., which she joined in 1982, including leading of Finance & Operations and Business Development for Intel in Israel. Ms. Simon is currently a board member of Audiocodes, a public company traded on Nasdaq and TASE, Nice Systems, a public company traded on Nasdaq and TASE, and Amiad water systems, a public company traded on London Stock Exchange. Ms. Simon is a former member of the board of directors of Insightec Ltd. (2005-2012), M-Systems Ltd., a Nasdaq listed company which was acquired in 2006 by SanDisk Corp., a public company traded on Nasdaq as well (2005-2006) and Tower Semiconductor Ltd., a public company traded on TASE and Nasdaq (1999-2004). Ms. Simon holds a B.A. in Social Sciences from the Hebrew University, Jerusalem, Israel, a law degree (LL.B.) from the Interdisciplinary Center in Herzliya and an M.A. in Business and Management from Boston University, USA.

Ms. Dafna Gruber was elected as the Company's external director in accordance with the provisions of the Companies Law in April 2015 and reelected in April 2018. Effective as of May 2018, and our adoption of the exemption under the Regulation, Ms. Gruber is no longer classified as an external director under the Companies Law. Ms. Gruber has 27 years of broad experience, serving as chief financial officer and a senior executive management member in leading hi-tech companies traded on both Nasdaq and TASE. Since February 2019, Ms. Gruber has been serving as chief financial officer of Aqua security Ltd., a private company. From September 2017 until February 2019, Ms. Gruber served as the chief financial officer of Landa Corporation Ltd., and then as financial advisor to Landa group. From October 2015 until September 2017, Ms. Gruber has been serving as the chief financial officer of Clal Industries Ltd., a private company. From April 2007 until April 2015, Ms. Gruber served as the chief financial officer of Nice Systems Ltd., a public company traded on Nasdaq and TASE. As a member of the senior management team, Ms. Gruber was a senior member of the strategy and M&A forum of the company. During her employment with Nice, Ms. Gruber was responsible, *inter alia*, for finance, operation, MIS and IT, legal and investor relations. From 1996 until May 2007, Ms. Gruber was part of Alvarion Ltd., a public company traded on Nasdaq and TASE, mostly as chief financial officer. Prior to that, from 1993 to 1996, Ms. Gruber was a controller at Lannet Data Communications Ltd., subsequently acquired by Lucent Technologies Inc. Ms. Gruber serves as an external director at TAT Technologies Ltd., a public company traded on Nasdaq and TASE, since November 2013, and as an external director at Tufin software technologies Ltd., a public company traded on NYSE since April 2019. Ms. Gruber is a certified public accountant and holds a Bachelor's degree in Accounting and Economics from Tel Aviv University, Israel.

Mr. Ronnie (Miron) Kenneth was appointed to serve as a director of the Company by our board of directors in December 2017 and was reappointed by our shareholders in April 2018. Mr. Kenneth is a veteran high-tech leader who served for ten years as Chairman and Chief Executive Officer at Voltaire Technologies Ltd. (Nasdaq: VOLT), leading it to an initial public offering on Nasdaq in 2007. Following Voltaire's merger with Mellanox Technologies Ltd. (Nasdaq: MLNX) in 2011, Mr. Kenneth became the Chief Executive Officer of Pontis Ltd., a privately-held company, until 2013. Mr. Kenneth currently serves as the Chairman of Teridion Technologies Ltd., and Varada Ltd., and he is a director of Allot Communications Ltd. (Nasdaq: ALLT) and Orbotech Ltd. (Nasdaq: ORBK). Mr. Kenneth holds a BA in Economics and Computer Science from the Bar-Ilan University and an MBA from the Golden Gate University, San Francisco.

Mr. Eitan Oppenhaim has been serving as the President and Chief Executive Officer of the Company since July 31, 2013, and was appointed by our board of directors to also serve as a director of the Company in October 2019. He has previously served as the Executive Vice President Global Business Group, since November 2010. From 2009 until 2010, Mr. Oppenhaim served as Vice President and Europe General Manager of Alvarion Ltd., a public company traded on Nasdaq. During the years 2007 through 2009, Mr. Oppenhaim served as Vice President of sales and marketing of OptimalTest Ltd. Prior to that, from 2002 till 2006, Mr. Oppenhaim served as Vice President – Business Manager of the Flat Panel Displays division of Orbotech Ltd., a public company traded on Nasdaq. From 2001 till 2002, Mr. Oppenhaim served as Managing Director of Asia Pacific at TTI Telecom International, a leading provider of assurance, analytics and optimization solutions to communications service providers (CSP) worldwide. Prior to that, from 1994 till 2001, Mr. Oppenhaim held several key executive positions at Comverse Network Systems Ltd., a public company traded on Nasdaq. Mr. Oppenhaim holds a BA in Economics from the Haifa University, Israel and an MBA from Ben-Gurion University, Beer-Sheva, Israel.

Mr. Dror David has served as the Chief Financial Officer since November 2005. Mr. David joined Nova in April 1998, as the Company's Controller, and since then served in various financial and operational positions, including the position of Vice President of Resources, in which he was responsible for the finance, operations, information systems and human resources functions of the Company. Mr. David was also a leading member in the Company's initial public offering on Nasdaq in 2000, the Company's private placement in 2007 and the Company's secondary offering in 2010. Prior to joining Nova, Mr. David spent five years in public accounting with Deloitte Touch in Tel Aviv, specializing in industrial high-tech companies. Mr. David is a Certified Public Accountant in Israel, holds a B.A. in Accounting and Economics from Bar Ilan University, and an M.B.A. from Derby University of Britain.

Dr. Shay Wolfling joined Nova in 2011, as Chief Technology Officer. Prior to joining Nova, Dr. Wolfling was an R&D manager at KLA-Tencor-Belgium (formerly ICOS Vision Systems, a public traded company acquired by KLA in 2008), where he led multidisciplinary metrology & inspection development projects. From 2000 until its technology acquisition by ICOS in 2005, Dr. Wolfling was a founder and Vice President of Research and Development of Nano-Or-Technologies, a start-up company with a proprietary technology for 3D optical measurements. Dr. Wolfling took Nano-Or from the idea stage to initial product sales. Prior to founding Nano-Or, Dr. Wolfling was a project manager in Y-Beam-Technologies, a start-up offering laser-based skin treatments. Dr. Wolfling has several patents under his name in the field of optical measurements. Dr. Wolfling holds a B.Sc. in physics and mathematics from the Hebrew University of Jerusalem, Israel, a second degree in physics from Tel-Aviv University, Israel and a Ph.D. in physics from the Hebrew University of Jerusalem, Israel.

Mr. Gabriel Waisman joined Nova in 2016 as our Chief Business Officer, responsible for the Company's customer facing groups, including global sales, marketing, customer support and applications. Mr. Waisman brings over 20 years of managerial expertise in a global geographically dispersed environment, and extensive experience in working with pioneering multidisciplinary technologies, particularly within the electronics and telecom sectors. Prior to joining Nova, Mr. Waisman served as President at Orbotech Pacific (Orbotech LTD, Hong Kong) from August 2013 until April 2016 and Orbotech West (Orbotech Inc., USA) from May 2011 until July 2013, where he was responsible for sales and marketing, finance and operations, and customer support. Previous to this, from June 2003 until May 2011, Mr. Waisman served in various managerial positions at Alvarion Technologies Ltd., starting as Strategic Marketing Director, EMEA, and moving on to Vice President of Strategic Accounts, General Manager of West Europe, followed by Managing Director, Asia-Pacific. Mr. Waisman has also served as EMEA Regional Sales and Marketing Director (Broadband division) at Comverse Ltd. Mr. Waisman holds a B.Sc. in Electronic Engineering from the Technion – Israel Institute of Technology, Haifa, Israel and an MBA in Business Administration from the Tel-Aviv University, Israel.

Mr. Adrian S. Wilson Joined Nova in January 2018 as General Manager Material Metrology Division and President of our US subsidiary, Nova Measuring Instruments, Inc. Mr. Wilson has over 25 years of Semiconductor capital equipment and materials experience. Mr. Wilson joins us from Nanometrics Inc, where he held the position of Vice President & General Manager of Advanced Imaging and Analytics Business Unit. Prior to Nanometrics Inc, he held the position of Managing Director of Element Six Technologies Ltd., the non-abrasive arm of the synthetic diamond group of DeBeers, focused on thermal management and optical components for the semiconductor industry. Mr. Wilson has experience in leading both start-ups and divisions within large public multi-national companies, including KLA-Tencor, FormFactor Inc. and Phoenix X-ray Systems & Services Inc., a capital equipment start-up. Mr. Wilson holds a bachelor's degree in Electronics Engineering, post Grad in Marketing Management and a MBA in Technology Management. Mr. Wilson's accreditations include Fellow of the Chartered Institute of Marketing (UK) and Fellow of the Institute of Directors (UK).

Mr. Gabi Sharon has served as Corporate Vice President of Operations since September 2006. Having joined Nova in 1995, Mr. Sharon served in several key positions in the Company including as Global Customer Support Manager from September 1995 to September 2004. From September 2004 until September 2006 Mr. Sharon managed the Product Development Division, and spearheaded the NovaScan 3090 product line and its successful market launch. For a period of two years, from 2004 to 2006, he also served as the Product Marketing Manager and led the initial penetration of the Copper CMP market. Prior to joining Nova Mr. Sharon served as Project Manager in ECI Israel. Mr. Sharon holds a B.Sc. in Computer Science from Northeastern University, Boston, Massachusetts, and a M.Sc. in Technology Management from Polytechnic University, New York.

Ms. Sharon Dayan has served as our Chief Human Resources Officer since August 2019. Ms. Dayan joined Nova in January 2018, and until August 2019 served as Corporate Vice President Human Resources. Ms. Dayan is an experienced HR executive, bringing diversified experience which covers all human resources disciplines, including HR strategy, organizational and people development, M&A and employee experience. Prior to joining Nova Ms. Dayan served in several senior HR regional and corporate positions within global companies. Her last position before joining Nova, was in the role of SVP at Teva in the capacity of HR Business Partner for the global corporate functions. Prior to that she served as the Global Head of HR as part of Comverse management, responsible for all HR functions in the company. Before joining Comverse, Ms. Dayan had multiple positions in Amdocs. Ms. Dayan holds BA in Social Science from Tel-Aviv – Jaffe college, MSc. In Organizational Development from Tel-Aviv University and Group dynamics diploma from Tel Aviv university.

Mr. Zohar Gil has served as our Corporate Vice President Marketing and Business Development since March 2016. Mr. Gil joined Nova in June 2011, and until March 2016 served in several key business and marketing positions including Head of Customer Management for Nova's foundry accounts in the Asia Pacific region and Head of Marketing and Product Management. Currently, as our Vice President Marketing and Business Development, Mr. Gil is focusing on the Company's corporate marketing, strategy and M&A activities. Prior to joining Nova, from 2001 until 2010, Mr. Gil held leading business and marketing positions at Alvarion Ltd., including General Manager for the Carrier Line of Business and Vice President of Product Management. Prior to that, from 1997 until 2001, Mr. Gil served in variety of marketing and product management positions in 3Com Corporation. Mr. Gil holds a B.Sc. in Industrial Engineering from Tel-Aviv University, Israel, and an Executive MBA from Northwestern and Tel-Aviv Universities from the Kellogg-Recanati Business School of Management.

Mr. Effi Aboody has served as our Corporate VP and General Manager Dimensional Metrology Division since September 2019. Mr. Aboody joined Nova in 2016 as Vice President and Head of the Global Applications team, and has over 20 years' experience in the Semiconductor Industry. He started his career at Intel as an Integration engineer, working in Portland and California R&D centers, in both logic and memory devices. Following that he held several managerial positions at Numonyx in Yield and Integration Departments. After that, he managed the Engineering and Yield Departments at Micron F12. He later returned to Intel to manage the F28 Yield Organization, responsible for CPU and SoC outgoing yield and performance. Effi holds an Executive MBA from Tel Aviv University and a B.Sc. in Materials Engineering from Ben-Gurion University.

Voting Agreement

We are not aware of any voting agreement currently in effect.

6.B Compensation

The aggregate compensation expensed, including share-based compensation and other compensation expensed by us, to our executive officers with respect to the year ended December 31, 2019 (consisting of 11 persons, including two former executive officers) was $6.9 million. This amount includes approximately $0.7 million set aside or accrued to provide pension, severance, retirement, or similar benefits and amounts expensed by the Company for automobiles made available to its executive officers).

Disclosure regarding the compensation of our senior executives on an individual basis will be disclosed in our proxy statement in connection with the 2019 annual general meeting of shareholders in accordance with Israeli regulations.

Terms of employment of Mr. Eitan Oppenhaim, our President and Chief Executive Officer and a member of the board of directors, as approved by our shareholders, are as follows:

General

(i) a monthly base salary of NIS 138,600; (ii) an annual bonus of up to fourteen (14) monthly base salaries (with additional payment of up to 100% of the target bonus in the case of over achievement), subject to objectives which are annually predetermined by the board of directors and its committees, in accordance with our compensation policy; (iii) in connection with termination of employment (other than for cause), a three month advance notice and a six month adjustment period, during which Mr. Oppenhaim will be entitled to all of his compensation elements, and to the continuation of vesting of his options. In the event of employment termination during a fiscal year (unless for cause), the bonus shall be prorated (subject to certain adjustments); (iv) customary social benefits such as pension fund or management insurance, education fund, vacation pay, sick leave and convalescence pay; (v) subject to required approvals under applicable law, a directors and officers insurance, including a “run-off” insurance policy; (vi) non-disclosure, non-compete and ownership of intellectual property undertakings; and (vii) monthly travel expenses or a Company car, cellular phone, a land line phone, toll road expenses, a laptop computer and other expense reimbursements pursuant to the Company general policies.

Equity-Based Compensation

Since January 1, 2016 until December 31, 2019, per the approval of the respective annual general meeting of shareholders, Mr. Oppenhaim was granted a total of 326,667 options to purchase ordinary shares of the Company with a weighted average exercise price of $20.73 and 11,111 restricted share units. The options and restricted share units: vest in equal annual installments over a terms of four years commencing one year from the grant date; expire seven (7) years after each grant date; can be cancelled in accordance with the terms and conditions of the applicable incentive plan of the Company or the employment terms of Mr. Oppenhaim; and, were made in accordance with and subject to Section 102 of the Income Tax Ordinance of 1961 (New Version) (the “Ordinance”). In addition, Mr. Oppenhaim was granted in July 2017, May 2018 and July 2019 90,000 performance based restricted units that vest over a period of three (3) years, provided that the Company exceeded the performance targets for vesting set by the compensation committee and board of directors of the Company, unless such restricted share units have been cancelled in accordance with the terms and conditions of the share incentive plan of the Company or the employment terms of Mr. Oppenhaim. In the event a portion of these restricted share units fails to vest, such portion will be carried forward to the third vesting date and will vest if the Company’s average annual return on equity based on net income during the previous three (3) years shall be no less than ten percent (10%).

Compensation upon Significant Event

Upon the occurrence of a Significant Event, unvested options granted to Mr. Oppenhaim will vest upon the consummation of the Significant Event, and unexercised options may be exercised until the earlier of two years from the consummation of the Significant Event, and termination of the options. Such arrangements will not apply if Mr. Oppenhaim remains the chief executive officer of our company or the surviving entity, and unvested options are replaced for new options of the surviving entity as part of the Significant Event with a vesting schedule and terms identical to the replaced options. Further, upon a Significant Event, Mr. Oppenhaim will be entitled to a special bonus of up to 12 monthly salaries, subject to the approval of the compensation committee and our board of directors and subject to the limitation on a special bonus imposed by our compensation policy. In the event of termination of employment (up to 12 months from the Significant Event), Mr. Oppenhaim will be entitled to the retirement terms under his employment agreement, the special bonus described above and the payment of the annual bonus in full for the year in which the Significant Event has occurred, subject to the annual bonus plan, on an annual basis calculation, and subject to the approval of the compensation committee and our board of directors prior to the consummation of the transaction, or the respective body in the new surviving entity following the transaction, as applicable. A “Significant Event” is defined for this purpose as: (1) the sale of all or substantially all of our company’s assets; (2) a merger of our company with or into another company or entity after which our shareholders will hold 50% or less of the surviving entity; (3) our company becoming a division or a subsidiary of another company; or (4) the purchase of our company's shares, after which the purchaser will hold 50% or more of our company's shares, provided, however, that the purchaser is not one of our institutional investors upon execution of the purchase agreement.

Compensation upon Acquisition

Upon Acquisition of a company (which is not an affiliate of the company), Mr. Oppenhaim will be entitled to receive a bonus of up to 12 monthly salaries subject to the approval of the compensation committee and our board of directors and subject to the limitation on a special bonus imposed by our compensation policy. An “Acquisition” includes, among others, a merger of our company or a subsidiary of our company with or into another entity, such that upon consummation of such transaction our shareholders will hold more than 50% of the surviving entity.

Directors and Officers Equity Based Compensation

As of February 14, 2020, a total of 790,359 options to purchase our ordinary shares and 194,227 RSU’s were outstanding and held by certain current executive officers and directors (consisting of 15 persons), of which 395,859 options are currently exercisable or exercisable within 60 days of February 14, 2020, 39,520 shares are held by trustee due to vested RSUs and no RSU’s will vest within 60 days of February 14, 2020. See “Item 6E. Share Ownership” in this annual report on Form 20-F.

In accordance with our current equity-based compensation policy, , the exercise price of granted options is equal to the closing sale price of the Company's ordinary shares on Nasdaq on the day of grant.

Compensation of Directors

The total amount paid or payable to the directors (consisting of seven persons from January until June 2019, and six persons from June until December 2019, not including Mr. Oppenhaim), for 2019 was $0.33 million.

The compensation arrangement of our directors (excluding the chairman of the board of directors and, unless approved otherwise, any other director who is also an employee of the Company) includes an annual payment of NIS 92,000 (approximately US$25,800) and a payment per meeting of NIS3,000 (approximately US$840) (for each execution of a written consent in lieu of a meeting, an amount of NIS 1,500 and for each meeting that the director attends by teleconference, an amount of NIS 1,800).

The compensation arrangement of Dr. Michael Brunstein, the chairman of our board of directors includes a gross annual fee of US$110,000 payable monthly in NIS.

In the 2019 annual general meeting, our shareholders approved an amendment to the equity-based compensation paid to our directors, such that each member of our board of directors (excluding the chairman) will be granted an annual award of options to purchase 3,340 ordinary shares and 2,220 restricted share units, or, options and restricted share units with an aggregate fair market value of US$100,000 (with the same ratio of options and restricted share units), the lower of the two. Such grant will be made to each director on the date of each annual general meeting at which such director is elected or reelected. Our chairman will be granted an annual award of options to purchase 15,850 ordinary shares and 10,550 restricted share units, or, options and restricted share units with an aggregate fair market value of US$600,000 (with the same ratio of options and restricted share units), the lower of the two. Such grant will be made on the date of each annual general meeting at which our chairman is elected or reelected. The exercise price of each option will be determined pursuant to our equity-based compensation policy and the equity awards will vest annually over a period of four years.

On June 17, 2019, our shareholders approved our current compensation policy.

The full text of our current compensation policy was included as Appendix A to the proxy statement attached to our report on Form 6-K, furnished to the Securities and Exchange Commission on May 7, 2019.

6.C Board Practices

Our Amended and Restated Articles of Association, as adopted by the Company's shareholders and recently amended on June 17, 2019, or the Articles, provide that we may have between five and nine directors. Our board of directors currently consists of seven directors, two of which are women.

Under the Companies Law, companies incorporated under the laws of the State of Israel that are "public companies," including companies with shares listed on the Nasdaq Global Select Market, are required to appoint at least two external directors.

Pursuant to regulations promulgated under the Companies Law, companies with shares traded on a U.S. stock exchange, including the Nasdaq Global Select Market, may, subject to certain conditions, "opt out" from the Companies Law requirements to appoint external directors and related Companies Law rules concerning the composition of the audit committee and compensation committee of the board of directors. In accordance with these regulations, in May 2018, we elected to "opt out" from the Companies Law requirements to appoint external directors and related Companies Law rules concerning the composition of the audit committee and compensation committee of the board of directors.

Under these regulations, the exemptions from such Companies Law requirements will continue to be available to us so long as: (i) we do not have a "controlling shareholder" (as such term is defined under the Companies Law), (ii) our shares are traded on a U.S. stock exchange, including the Nasdaq Global Select Market, and (iii) we comply with the director independence requirements, the audit committee and the compensation committee composition requirements, under U.S. laws (including applicable Nasdaq Rules) applicable to U.S. domestic issuers.

Our board of directors has determined that all of our directors qualify as ‘‘independent directors’’ as defined by The Nasdaq Stock Market Rules.

Our Articles provide that directors may be elected at our annual general meeting of shareholders by a vote of the holders of more than 50% of the total number of votes represented at such meeting, not taking into consideration abstention votes. In addition, our board of directors is authorized to appoint directors, at its discretion, provided that the total number of directors does not exceed the maximum number of directors permitted by the Articles. Our directors (other than the directors who were in the position of external directors until May 2018) serve as such until the next annual general meeting of our shareholders. Effective as of May 2018, and our adoption of the exemption under the Israeli Companies Regulations (Reliefs for Public Companies whose Shares are Listed on a Stock Exchange Outside of Israel), 2000, or the Regulation, our directors in office who were elected and classified as external directors, Ms. Dafna Gruber and Ms. Zehava Simon, are no longer classified as such under the Companies Law. The transition rules set forth under the Regulation provide that such directors have the right to remain in office as our directors at their option after the exemption under the Regulation is adopted until the earlier of such directors’ original end of term of office or the second annual meeting of shareholders after the adoption of the exemption under the Regulation, which in the case of Ms. Gruber is until the date of our annual meeting of shareholders to be held in 2020, and in case of Ms. Simon is until earlier of the date of our annual meeting of shareholders to be held in 2020 and June 2020.

According to the Companies Law, the board of directors of a public company must establish the minimum number of board members that are to have accounting and financial expertise while considering, *inter alia*, the nature of the company, its size, the scope and complexity of its operations and the number of directors stated in the Articles.

Our board of directors resolved that the minimum number of board members that need to have accounting and financial expertise is one (1).

Our board of directors determined that each of Ms. Dafna Gruber and Ms. Zehava Simon has accounting and financial expertise as described in the regulations promulgated pursuant to the Companies Law, and that, therefore, the requirements of the minimum number of board members that need to have accounting and financial expertise, as set by the board of directors, has been met.

Our board of directors has adopted a training program for newly appointed directors. Once appointed and following the completion of their onboard training, our directors continue to receive ongoing training as part of our directors training and development efforts.

Family Relationships

There are no family relationships between any members of our executive management and our directors.

Board of Directors’ Committees

The Company’s board of directors has appointed the following committees:

Audit Committee

Our Audit Committee is comprised of Dafna Gruber, Zehava Simon and Avi Cohen. The audit committee is responsible to provide oversight of the accounting and financial reporting process of the Company and the audits of the financial statements of the Company, and assist the Board in its oversight of (i) the integrity of the Company's financial statements and other published financial information, (ii) the Company's compliance with applicable financial and accounting related standards, rules and regulations, (iii) the selection, engagement and termination, subject to shareholder approval, of the Company's independent auditor, (iv) the pre-approval of all audit, audit-related and all permitted non-audit services, if any, by the Company's independent auditor, and the compensation therefor, (v) the Company's internal controls over financial reporting and (vi) risk assessment and risk management.

Under the Companies Law, the audit committee is responsible, among others, for (i) identifying deficiencies in the business management practices of the Company, including by consulting with the internal auditor, and recommending remedial actions with respect to such deficiencies; (ii) reviewing and approving related party transactions, including, among others, determining whether or not such transactions are deemed material actions or extraordinary transactions; (iii) ensuring that a competitive process is conducted for related party transactions with a controlling shareholder (regardless of whether or not such transactions are deemed extraordinary transactions), optionally based on criteria which may be determined by the audit committee annually in advance; (iv) setting forth the approval process for transactions that are 'non-negligible' (i.e., transactions with a controlling shareholder that are classified by the audit committee as non-negligible, even though they are not deemed extraordinary transactions), as well as determining which types of transactions would require the approval of the audit committee, optionally based on criteria which may be determined annually in advance by the audit committee; (v) evaluating the Company's internal audit program and the performance of the Company's internal auditor and the resources at his/her disposal; (vi) reviewing the scope of work of the Company's external auditor and making recommendations regarding his/her salary; and (vii) creating procedures relating to the employees' complaints regarding deficiencies in the administration of the Company as well as adopting against retaliation. The audit committee is also responsible for reviewing and approving any material change or waiver in the Company's Corporate Code of Conduct regarding directors or executive officers, and disclosures made in the Company's annual report in such regard. The audit committee operates under a charter dully adopted by the board of directors.

Our board of directors has determined that each member of our audit committee is independent as such term is defined in Rule 10A-3 under the Exchange Act, and that each member of our audit committee satisfies the additional requirements applicable under the Nasdaq rules to members of an audit committee.

Compensation Committee

Our Compensation Committee is comprised of Zehava Simon, Dafna Gruber, Raanan Cohen and Miron (Ronnie) Kenneth. The function of the compensation committee is described in the approved charter of the committee, and includes assisting the board of directors in discharging its responsibilities relating to compensation of the Company's officers, directors and executives and the overall compensation programs and reviewing and approving, or if required by law, approving and recommending for approval by the board of directors, grants and awards under the Company's equity incentive plans. The primary objective of the committee is to oversee the development and implementation of the compensation policies and plans that are appropriate for the Company in light of all relevant circumstances, and which provide incentives that fit the Company's long-term strategic plans and are consistent with the culture of the Company and the overall goal of enhancing shareholder's value.

Our board of directors has determined that each member of our compensation committee is independent under the Nasdaq rules, including the additional independence requirements applicable to the members of a compensation committee.

Under the Companies Law and our compensation committee charter, our compensation committee is responsible, among others, for (i) recommending to the board of directors regarding its approval of a compensation policy in accordance with the requirements of the Companies Law, and any other compensation policies, incentive-based compensation plans and equity-based plans; (ii) overseeing the development and implementation of such compensation plans and policies that are appropriate in light of all relevant circumstances and recommending to the board of directors regarding any amendments or modifications that the compensation committee deems appropriate; (iii) determining whether to approve transactions concerning the terms of engagement and employment of our officers and directors that require compensation committee approval under the Companies Law or our compensation plans and policies; and (iv) taking any further actions as the compensation committee is required or allowed to under the Companies Law or the compensation plans and policies.

Nominating Committee

Our *Nominating Committee* is comprised of Ronnie (Miron) Kenneth, Michael Brunstein, and Zehava Simon. The function of the nominating committee is described in the approved charter of the committee, and includes responsibility for identifying individuals qualified to become board members and recommending that the board of directors consider the director nominees for election at the general meeting of shareholders. The nominating and corporate governance committee is also responsible for developing and recommending to the board of directors a set of corporate governance guidelines applicable to the Company, periodically reviewing such guidelines and recommending any changes thereto.

Our audit committee also acts as our investment committee.

All committees are acting according to written charters that were approved by our board of directors. Additionally, we adopted an internal enforcement plan which was approved by our board of directors. The internal enforcement plan, as part of which we adopted and implementing procedures and policies in order to comply with the provisions of the Israeli Securities Law, 5728-1968 (the “Israeli Securities Law”), the Companies Law and the applicable guidelines issued by Israeli Securities Authority. The internal enforcement plan includes, among others, the board committees’ charters, procedures with respect to related party transactions, insider trading, which prohibits hedging activities, reporting and complaints, anti-bribery policy and a code of conduct. Each of our committees have the power to retain, terminate and approve the related fees and other retention terms, as it deems appropriate, outside counsel and other experts and consultants to assist the committee in connection with its responsibilities without our board of directors’ approval and at the Company's expense.

Approval of Related Party Transaction

The Companies Law requires that office holders of a company, including directors and executive officers, promptly disclose to the board of directors any personal interest they may have and all related material information known to them about any existing or proposed transaction with such company. The approval of the board of directors is required for 'non-extraordinary' transactions between a company and its office holders, or between a company and other persons in which an office holder has a personal interest, unless such company's articles of association provide otherwise. Under the Companies Law, a 'non-extraordinary' transaction between a company or between the company and a third party in which an office holder of a company has a personal interest, will require the approval of the board of directors or a committee authorized by the board of directors, unless such company's articles of association provide otherwise. Our Articles do not provide otherwise, and therefore such transaction requires the approval of our board of directors. If a transaction is an “extraordinary transaction”, it is subject to the approval of the audit committee prior to its approval by the board of directors. For information regarding the necessary approvals under the Companies Law for transactions with office holders and directors regarding their terms of engagement with the company, see “— Compensation of Officers and Directors” in this Item below.

In addition, an extraordinary transaction between a public company and a controlling shareholder (i.e. a shareholder who has the ability to direct the activities of a company, including a shareholder that owns 25% or more of the voting rights if no other shareholder owns more than 50% of the voting rights, but excluding a shareholder whose power derives solely from its position on the board of directors or any other position with the company), or in which a controlling shareholder has a personal interest, including a private placement in which the controlling shareholder has a personal interest, a transaction between a public company and a controlling shareholder, the controlling shareholders' relative, or entities under its control, directly or indirectly, with respect to services to be provided to the public company, and a transaction concerning the terms of compensation of the controlling shareholder or the controlling shareholder’s relative, who is an office holder or an employee, requires the approval of the audit committee or, in some cases, the compensation committee (see "— Compensation of Officers and Directors" in this Item below), the board of directors and a majority of the shares voted by the shareholders of the company participating and voting on the matter in a shareholders’ meeting. In addition, the shareholder approval must fulfill one of the following requirements: (i) the majority must include at least a majority of the shares of the voting shareholders who have no personal interest in the transaction (in counting the total votes of such shareholders, abstentions are not taken into account); or (ii) the total of opposition votes among the shareholders who have no personal interest in the transaction may not exceed 2% of the aggregate voting rights in the company. Any such transaction the term of which is more than three years, must be approved in the same manner every three years, unless with respect to certain transactions as permitted by the Companies Law, the audit committee has determined that longer term is reasonable under the circumstances.

According to the Companies Law, if an extraordinary transaction is discussed by the board of directors or the audit committee, directors and office holders that have personal interest in the proposed transaction, may not participate in the discussion or vote. However, if the majority of the members of the audit committee or the board of directors (as applicable) have personal interest in the proposed transaction, then all directors (including those with personal interest) may participate in the discussion and vote, provided that in the event the majority of the members of the board of directors have personal interest in the transaction, said transaction will also be subject to the approval of the Company's shareholders.

Compensation of Officers and Directors

Under the Companies Law, Israeli public companies are required to establish a compensation committee and adopt a policy regarding the compensation and terms of employment of their directors and officers. For information on the composition, roles and objectives of the compensation committee pursuant to the Companies Law and our compensation committee charter, see above “—Board of Directors” Committees — Compensation Committee" in this annual report on Form 20-F.

Pursuant to the Companies Law, the compensation policy must be approved by the company's board of directors after reviewing the recommendations of the compensation committee. The compensation policy also requires the approval of the general meeting of the shareholders, which approval must satisfy one of the following (the "Majority Requirement"): (i) the majority should include at least a majority of the shares of the voting shareholders who are non-controlling shareholders or do not have a personal interest in the approval of the compensation policy (in counting the total votes of such shareholders, abstentions are not be taken into account) or (ii) the total number of votes against the proposal among the shareholders mentioned in paragraph (i) does not exceed two percent of the aggregate voting power in the company. Under certain circumstances and subject to certain exceptions, the board of directors may approve the compensation policy despite the objection of the shareholders, provided that the compensation committee and the board of directors determines that it is for the benefit of the company, following an additional discussion and based on detailed arguments.

The Companies Law provides that the compensation policy must be re-approved (and re-considered) every three years, in the manner described above. Moreover, the board of directors is responsible for reviewing from time to time the compensation policy and deciding whether or not there are any circumstances that require an adjustment to the company's compensation policy. When approving the compensation policy, the relevant organs must take into consideration the goals and objectives listed in the Companies Law, and include reference to specific issues listed in the Companies Law. Such issues include, among others (the "Compensation Policy Mandatory Criteria"): (i) the relevant person's education, qualifications, professional experience and achievements; (ii) such person's position within the company, the scope of his responsibilities and previous compensation arrangements with the company; (iii) the proportionality of the employer cost of such person in relation to the employer cost of other employees of the company, and in particular, the average and median pay of other employees in the company, including contract workers, and the impact of the differences between such person's compensation and the other employees' compensation on the labor relations in the company; (iv) the authority, at the board of director's sole discretion, to lower any variable compensation components or set a maximum limit (cap) on the actual value of the non-cash variable components, when paid; and (v) in the event that the terms of engagement include any termination payments - the term of employment of the departing person, the company's performance during that term, and the departing person's contribution to the performance of the company.

In addition, the Companies Law provides that the following matters must be included in the compensation policy (the "Compensation Policy Mandatory Provisions"): (i) the award of variable components must be based on long term and measurable performance criteria (other than non-material variable components, which may be based on non-measurable criteria taking into account the relevant person's contribution to the performance of the company); (ii) the company must set a ratio between fixed and variable pay, set a cap on the payment of any cash variable compensation components as of the payment of such components, and set a cap on the maximum cash value all non-cash variable components as of their grant date; (iii) the compensation policy must include a provision requiring the relevant person to return to the company any compensation that was awarded on the basis of financial figures that were subsequently restated; (iv) equity based variable compensation components should have an appropriate minimum vesting periods, which should be linked to long term performance objectives; and (v) the company must set a clear limit on termination payments.

Pursuant to the Companies Law, any transaction with an office holder (except directors and the chief executive officer of the company) with respect to such office holder's compensation arrangements and terms of engagement, requires the approval of the compensation committee and the board of directors. Such transaction must be consistent with the provisions of the company's compensation policy, provided that the compensation committee and the board of directors may, under special circumstances, approve such transaction that is not in accordance with the company's compensation policy, if both of the following conditions are met: (i) the compensation committee and the board of directors discussed the transaction in light of the roles and objectives of the compensation committee (also see above "—Board of Directors' Committees — Compensation Committee" in this annual report on Form 20-F) and after taking into consideration the Compensation Policy Mandatory Criteria and including in such transaction the Compensation Policy Mandatory Provisions; and (ii) the company's shareholders approved the transaction, provided that in public companies the approval must satisfy the Majority Requirement. Notwithstanding the above, the compensation committee and the board of directors may, under special circumstances, approve such transaction even if the shareholders' meeting objected to its approval, provided that (i) both the compensation committee and the board of directors re-discussed the transactions and decided to approve it despite the shareholder's objection, based on detailed arguments, and (ii) the company is not a 'Public Pyramid Held Company'. For the purpose hereof, a "Public Pyramid Held Company" is a public company that is controlled by another public company (including companies that issued only debentures to the public), which is also controlled by another public company (including companies that issued only debentures to the public) that has a controlling shareholder.

Transactions between public companies (including companies that have issued only debentures to the public) and their chief executive officer, with respect to his or her compensation arrangement and terms of engagement, require the approval of the compensation committee, the board of directors and the shareholder's meeting, provided that the approval of the shareholders' meeting must satisfy the Majority Requirement. Notwithstanding the above, the compensation committee and the board of directors may, under special circumstances, approve such transaction with the chief executive officer even if the shareholders' meeting objected to its approval, provided that (i) both the compensation committee and the board of directors re-discussed the transactions and decided to approve it despite the shareholder's objection, based on detailed arguments, and (ii) the company is not a Public Pyramid Held Company. Such transaction with the chief executive officer must be consistent with the provisions of the company's compensation policy, provided that the compensation committee and the board of directors may, under special circumstances, approve such transaction that is not in accordance with the company's compensation policy, if both of the following conditions are met: (i) the compensation committee and the board of directors discussed the transaction in light of the roles and objectives of the compensation committee (see above —"Board of Directors' Committees – Compensation Committee" in this annual report on Form 20-F) and after taking into consideration the Compensation Policy Mandatory Criteria and including in such transaction the Compensation Policy Mandatory Provisions; and (ii) the company's shareholders approved the transaction, provided that in public companies the approval must satisfy the Majority Requirement. In addition, the compensation committee may determine that such transaction with the CEO does not have to be approved by the shareholders of the company, provided that: (i) the chief executive officer is independent based on criteria set forth in the Companies Law; (ii) the compensation committee determined, based on detailed arguments, that bringing the transaction to the approval of the shareholders may compromise the chances of entering into the transaction; and (iii) the terms of the transaction are consistent with the provisions of the company's compensation policy. Under the Companies Law, non-material amendments of transactions relating to the compensation arrangement or terms of engagement of office holders (including the chief executive officer), require only the approval of the compensation committee.

With respect to transactions relating to the compensation arrangement and terms of engagements of directors in public companies (including companies that have issued only debentures to the public), the Companies Law provides that such transaction is subject to the approval of the compensation committee, the board of directors and the shareholders' meeting. Such transaction must be consistent with the provisions of the company's compensation policy, provided that the compensation committee and the board of directors may, under special circumstances, approve such transaction that is not in accordance with the company's compensation policy, if both of the following conditions are met: (i) the compensation committee and the board of directors discussed the transaction in light of the roles and objectives of the compensation committee (see above "—Board Practices –Board of Directors' Committees – Compensation Committee" in this annual report on Form 20-F) and after taking into consideration the Compensation Policy Mandatory Criteria and including in such transaction the Compensation Policy Mandatory Provisions; and (ii) the company's shareholders approved the transaction, provided that in public companies the approval must satisfy the Majority Requirement.

Pursuant to the Companies Law, a compensation policy must be re-approved (and re-considered) at least once in every three years. The current compensation policy was approved by our shareholders in June 2019.

Internal Auditor

Under the Companies Law, the board of directors must also appoint an internal auditor nominated by the audit committee. Our internal auditor is Ms. Dana Gottesman-Erlich, CPA (Isr.) of BDO Ziv Haft, an independent registered accounting firm which is a part of the BDO international accounting firm. The role of the internal auditor is to examine whether a company's actions comply with the law and proper business procedure. The internal auditor may not be an interested party or office holder, or a relative of any interested party or office holder, and may not be a member of the company's independent accounting firm or its representative. The Companies Law defines an interested party as a holder of 5% or more of the shares or voting rights of a company, any person or entity that has the right to nominate or appoint at least one director or the general manager of the company or any person who serves as a director or as the general manager of a company. Our internal auditor is working based on a risk survey and audit plan, which is determined by our audit committee and approved by our board of directors.

6.D Employees

Set forth below is a chart showing the number of people we employed at the times indicated:

	As of December 31,		
	2017(*)	2018(*)	2019(*)
Total Personnel	616	662	646
Located in Israel	352	373	349
Located abroad	264	289	297
In operations	100	100	108
In research and development	216	275	251
In global business	251	242	247
In general and administration	49	45	40

(*) The numbers of employees set forth in this table do not include contractors and an insignificant number of temporary employees retained by the Company from time to time.

We were a member of the Industrialists Association in Israel, an employer's union until December 31, 2006. Under applicable Israeli law, we and our employees are subject to protective labor provisions such as restrictions on working hours, minimum wages, paid vacation, sick pay, severance pay and advance notice of termination of employment as well as equal opportunity and anti-discrimination laws. Orders issued by the Israeli Ministry of Economy and Industry make certain industry-wide collective bargaining agreements applicable to us. These agreements affect matters such as cost of living adjustments to salaries, length of working hours and week, recuperation and travel expenses. In Israel, we are subject to the instructions of the Extension Order in the Industrial Field for Extensive Pension Insurance 2006 according to the Israeli Collective Bargaining Agreements Law, 1957 (the "Extension Order"). The Extension Order determines the pension terms of the employees which fall under its criteria.

6.E Share Ownership

Based on information provided to us, our 15 directors and officers listed in Item 6A above, have had, as a group, sole voting and investment power for 435,379 shares beneficially owned by them as of February 14, 2020 (representing 1.6% of the 28,050,720 issued and outstanding ordinary shares of our company as of such date). Such number includes 395,859 shares subject to options that are immediately exercisable or exercisable within 60 days of February 14, 2020 (with expiration dates ranging between 2020 and 2026; exercise prices ($/share) ranging between 4.2 and 31.84), 39,520 shares held by the trustee due to vested RSUs, and no RSUs to be vested within 60 days as of February 14, 2020. Each of such directors and executive officers beneficially owned less than 1% of our company's shares as of such date.

Beneficial ownership of shares is determined in accordance with the rules of the SEC and generally includes any shares over which a person exercises sole or shared voting or investment power. Ordinary shares that are subject to warrants or options that are presently exercisable or exercisable within 60 days of the date of February 14, 2020 are deemed to be outstanding and beneficially owned by the person holding the options for the purpose of computing the percentage ownership of that person, but are not treated as outstanding for the purpose of computing the percentage of any other person.

Employee Benefit Plans

The share option plans under which we have outstanding equity grants, are described below:

2007 Incentive Plan (which was active until October 2017) - As of December 31, 2019, options to purchase 4,304,112 ordinary shares at an exercise prices which range from $0.43 to $24.96, the fair market value of our shares on the dates of grant, were granted under this plan of which, as of December 31, 2019, 2,532,141 options were exercised, 550,341 options were outstanding and exercisable, 1,075,730 options had been cancelled and 145,900 were outstanding and unvested. As of December 31, 2019, 834,142 RSU's had been granted, of which 686,919 had vested, 104,418 had been cancelled and 42,805 RSU's were outstanding. Following adoption of 2017 share incentive plan, as detailed herein, we have ceased granting equity under the 2007 incentive plan.

2017 Share Incentive Plan - The maximum number of ordinary shares to be issued under the plan, which was adopted by our board of directors on August 1, 2017, is 2,500,000, subject to future increases or decreases by the Company. As of December 31, 2019, options to purchase 588,261 ordinary shares at an exercise prices which range from $22.56 to $34.85, the closing price of the Company's ordinary shares on Nasdaq on the day of grant, were granted under this plan of which, as of December 31, 2019, 3,045 options were exercised, 122,354 options were outstanding and exercisable, 61,548 options had been cancelled and 401,314 were outstanding and unvested. As of December 31, 2019**,** 437,195 RSU's had been granted, of which 67,010 RSU's had vested, 25,772 had been cancelled and 344,413 RSU's were outstanding.

On June 17, 2019, our shareholders (following an approval by our compensation committee and board of directors), approved the Company's compensation policy, which includes, among others, provisions relating to equity-based compensation for Nova's executive officers.

The compensation policy provides, among others, that: (i) such equity based compensation is intended to be in a form of share options and/or other equity based awards, such as RSUs, in accordance with the Company's equity incentive plan in place as may be updated from time to time; (ii) all equity-based incentives granted to executive officers will be subject to vesting periods in order to promote long-term retention of the awarded executive officers. Unless determined otherwise in a specific award agreement approved by the compensation committee and the board of directors, grants to executive officers (other than directors) will vest gradually over a period of between three to five years; and (iii) all other terms of the equity awards will be in accordance with Nova's incentive plans and other related practices and policies. The board of directors may, following approval by the compensation committee, extend the period of time for which an award is to remain exercisable and make provisions with respect to the acceleration of the vesting period of any executive officer's awards, including, without limitation, in connection with a corporate transaction involving a change of control, subject to any additional approval as may be required by the Companies Law. The compensation policy also provides that the equity-based compensation will be granted from time to time and be individually determined and awarded according to the performance, educational background, prior business experience, qualifications, role and the personal responsibilities of the executive officer. The fair market value of the equity-based compensation for the executive officers will be determined according to acceptable valuation practices at the time of grant. Our compensation policy provides that equity-based compensation awarded to employees, executive officers or directors shall not be, in the aggregate, in excess of 10% of our share capital on a fully diluted basis at the date of the grant.

Our equity-based compensation policy, which was initially adopted in February 2007 and was most recently amended in December 2018, provides, among others, that the exercise price for each option will be equal to the closing sale price of the Company's ordinary shares on Nasdaq on the day of grant.

For additional information regarding our employees' incentive plans, see Note 9 of our consolidated financial statements, contained elsewhere in this report.

Item 7. Major Shareholder and Related Party Transactions

A. Major Shareholders

The following table sets forth certain information regarding the beneficial ownership of our outstanding ordinary shares as of the dates indicated below for each person who we know beneficially owns five percent or more of the outstanding ordinary shares.

Beneficial ownership of shares is determined under rules of the SEC and generally includes any shares over which a person exercises sole or shared voting or investment power. Applicable percentages are based on 28,050,720 ordinary shares outstanding as of February 14, 2020.

Name	Number of Ordinary Shares Beneficially Owned	Percentage of Ordinary Shares Beneficially Owned
Adage Capital Partners GP, L.L.C. (1)	2,607,965	9.29%
Menora Mivtachim Holdings Ltd.(2)	2,180,405	7.77%
Harel Insurance Investments & Financial Services Ltd. (3)	2,123,869	7.57%
The Phoenix Holdings Ltd. (4)	2,104,839	7.50%
Renaissance Technologies LLC. (5)	1,997,098	7.12%

(1) The information is based upon Amendment no. 1 to Schedule 13G filed with the SEC by Adage Capital Partners LP, Adage Capital Partners GP, L.L.C and Adage Capital Advisors L.L.C on February 12, 2020

(2) The information is based upon Amendment no. 3 to Schedule 13G filed with the SEC by Menora Mivtachim Holdings Ltd., Menora Mivtachim Pensions and Gemel Ltd., Menora Mivtahim Insurance Ltd., Menora Mivtachim Vehistadrut Hamehandesim Nihul Kupot Gemel Ltd. and Shomera Insurance Company Ltd. on February 12, 2020.

(3) The information is based upon Amendment no. 6 to Schedule 13G filed with the SEC by Harel Insurance Investments & Financial Services Ltd. on January 23, 2020.

(4) The information is based upon Amendment no. 2 to Schedule 13G filed with the SEC by The Phoenix Holdings Ltd., Delek Group Ltd. and Itshak Sharon (Tshuva) on February 18, 2020 regarding holdings as of December 31, 2019.

(5) The information is based upon Amendment no. 6 to Schedule 13G filed with the SEC by Renaissance Technologies LLC on February 13, 2020.

All the shareholders of the Company have the same voting rights.

To our knowledge, the significant changes in the percentage of ownership held by our major shareholders during the past three years have been: (i) the decrease in the percentage of ownership by Clal Insurance Enterprises Holdings Ltd. below 5% in 2017, increase above 5% in 2018 and decrease below 5% in 2019; (ii) the decrease in the percentage of ownership held by Wellington Management Group LLP, Wellington Group Holdings LLP, Wellington Investment Advisors Holdings LLP and Wellington Management Company LLP below 5% in 2017; (iii) the increase in the percentage of ownership held by Menora Mivtachim Holdings Ltd. above 5% in 2017; (iv) the increase in the percentage of ownership of Psagot Investment House Ltd. above 5% in 2018, and the decrease in the percentage of ownership below 5% in 2019; (v) the decrease in the percentage of ownership of Yelin Lapidot Holdings Management Ltd., Dov Yelin, Yair Lapidot below 5% in 2018 (vi) the decrease of in the percentage of ownership of Migdal Insurance & Financial Holdings below 5% in 2018; and (vi) the decrease in the percentage of ownership by The Phoenix Holdings Ltd., Itshak Sharon (Tshuva), and Delek Group Ltd below 5% in 2017 and the increase above 5% in 2018; and (vii) the increase in the percentage of ownership by Adage Capital Partners LP, Adage Capital Partners GP, L.L.C and Adage Capital Advisors L.L.C above 5% in 2019.

As of February 14, 2020, our ordinary shares were held by 15 registered holders (not including CEDE & Co.). Based on the information provided to us by our transfer agent, as of February 14, 2020, 13 registered holders were U.S. domicile holders and held approximately 0.13% of our outstanding ordinary shares.

Control of Registrant

To the Company's knowledge, it is not owned or controlled by a foreign government. Except for the shareholders identified above owning more than five percent of the Company's ordinary shares, the Company has no knowledge of any corporation or other natural or legal person owning a controlling interest in the Company.

B. Related Party Transactions

In June 2019, we obtained directors' and officers' liability insurance for our officers and directors with coverage in an aggregate amount of $55,000,000 (including $5,000,000 Side A DIC). This directors' and officers' liability insurance was presented and approved by our compensation committee in accordance with the framework under our compensation policy.

Our compensation policy authorizes the Company, as long as the compensation policy is in effect, to extend and/or renew the directors' and officers' liability insurance or enter into a new insurance policy, provided however, that the insurance transaction complies with the following conditions: (i) the annual premium to be paid by us will not exceed 2.0% of the aggregate coverage of the insurance policy; (ii) the limit of liability of the insurer will not exceed the greater of $50 million or 30% of our shareholders equity based on our most recent financial statements at the time of approval by the compensation committee; and (iii) the insurance policy, as well as the limit of liability and the premium for each extension or renewal will be approved by the compensation committee (and, if required by law, by the board of directors) which will determine that the sums are reasonable considering our exposures, the scope of coverage and the market conditions and that the insurance policy reflects the current market conditions, and it will not materially affect our profitability, assets or liabilities.

Further, upon circumstances to be approved by the compensation committee (and, if required by law, by the board of directors), we will be entitled to enter into a "run off" insurance policy of up to seven years, with the same insurer or any other insurance, as follows: (i) the limit of liability of the insurer will not exceed the greater of $50 million or 30% of our shareholders equity based on our most recent financial statements at the time of approval by the compensation committee; (ii) the annual premium will not exceed 300% of the last paid annual premium; and (iii) the insurance policy, as well as the limit of liability and the premium for each extension or renewal will be approved by the compensation committee (and, if required by law, by the board of directors) which shall determine that the sums are reasonable considering our exposures covered under such policy, the scope of cover and the market conditions, and that the insurance policy reflects the current market conditions and that it will not materially affect our profitability, assets or liabilities.

We may also extend the insurance policy in place to include cover for liability pursuant to a future public offering of securities as follows: (i) the additional premium for such extension of liability coverage will not exceed 50% of the last paid annual premium; and (ii) the insurance policy as well as the additional premium will be approved by the compensation committee (and if required by law, by the board of directors) which will determine that the sums are reasonable considering the exposures pursuant to such public offering of securities, the scope of cover and the market conditions and that the insurance policy reflects the current market conditions, and it does not materially affect our profitability, assets or liabilities.

In addition, we undertook to indemnify our officers and directors. On June 21, 2012, the shareholders at the annual general meeting approved an amended letter of indemnification to be given to our directors and officers. The aggregate indemnification amount that the Company can pay to all its officers and directors pursuant to these letters of indemnification will not exceed 25% of the Company's shareholders' equity, according to the most recent consolidated financial statement prior to the date of indemnification payment. Prior to that, we undertook to indemnify our officers and directors up to an aggregate amount of $10,000,000 or 25% of the Company's shareholders equity, the higher of the two. Pursuant to our amended and restated compensation policy, we may indemnify our directors and officers to the fullest extent permitted by applicable law, for any liability and expense that may be imposed on the director or the officer, as provided in the indemnity agreement between us and such individuals, all subject to applicable law and our articles of association. Our amended and restated compensation policy also provides that we may exempt our directors and officers in advance for all or any of their liability for damage in consequence of a breach of the duty of care vis-a-vis our company, to the fullest extent permitted by applicable law.

For information relating to options granted to officers and directors, see "Item 6E. Share Ownership" in this annual report on Form 20-F. For information regarding our compensation policy and compensation arrangements with our directors and executive officers (including our chairman and chief executive officer), please refer to "Item 6B. Compensation" in this annual report on Form 20-F.

7.C Interest of Experts and Counsel

Not applicable.

Item 8. Financial Information

8.A Consolidated Statements and Other Financial Information

See "Item 17. Financial Statements" in this annual report on Form 20-F and pages F-1 through F-34.

Legal Proceedings

From time to time, we or our subsidiaries may be a party to legal proceedings and claims in the ordinary course of business. While the outcome of these matters cannot be predicted with certainty, we do not believe they will have a material effect on our consolidated financial position, results of operations, or cash flows.

We are currently not involved in any significant legal proceedings.

Dividend Policies

We anticipate that, for the foreseeable future, we will retain any earnings to support operations and to finance the growth and development of our business. Therefore, we do not expect to pay cash dividends for at least the next several years.

The distribution of dividends may be limited by the Companies Law, which permits the distribution of dividends only out of retained earnings or earnings derived over the two most recent fiscal years, whichever is higher, provided that there is no reasonable concern that payment of a dividend will prevent a company from satisfying its existing and foreseeable obligations as they become due. Our Amended and Restated Articles of Association provide that dividends will be paid at the discretion of, and upon resolution by, our board of directors.

In addition, distribution of dividends may be subject to certain tax implication. For additional information regarding tax implication of dividends' distribution, see "Item 10E. Taxation – Israeli Taxation" in this annual report on Form 20-F.

Export Sales

Substantially all of our products are sold to customers located outside Israel and the United States.

8.B Significant Changes

Not applicable.

Item 9. The Offer and Listing

9.A Offer and Listing Details

Our ordinary shares began trading on Nasdaq on April 11, 2000 under the symbol "NVMI". Our ordinary shares were registered for trading on the Tel Aviv Stock Exchange Ltd. in 2002 under the symbol "נובה".

9.B Plan of Distribution

Not applicable.

9.C Markets

Our ordinary shares are quoted on the Nasdaq Global Select Market under the symbol "NVMI" and on the Tel Aviv Stock Exchange Ltd.

9.D Selling Shareholders

Not applicable.

9.E Dilution

Not applicable.

9.F Expenses on the Issue

Not applicable.

Item 10. Additional Information

10.A Share Capital

Not applicable.

10.B Memorandum and Articles of Association

A copy of our amended and restated articles of association is attached as Exhibit 1.1 to this annual report on Form 20-F. The information called for by this Item is set forth in Exhibit 2.1 to this annual report on Form 20-F and is incorporated by reference into this annual report on Form 20-F.

10.C Material Contracts

Israeli Lease Agreement

On May 3, 2018, we entered into a lease agreement, or the Lease Agreement, with Bayside Land Corporation Ltd., or Bayside.

Pursuant to the Lease Agreement, we are currently leasing from Bayside a total of approximate 10,000 square meters, or the Initial Space, in a new building at the Science Park in Rehovot.

The lease period for the Initial Space extend until 2029, or the Initial Lease Period. We have the option to extend the lease period by two periods of five years each, subject to customary conditions.

The Lease agreement also includes a leasing of an additional space of approximately 2,000 square meters, or the Additional Space, which is expected to begin in 2021, and may be extended through the same lease periods as the Initial Space.

These leases cannot be terminated by us during the Initial Lease Period. Under certain circumstances, Bayside may terminate the Agreement in the event of change of control in the Company.

The average monthly lease, parking and management costs for the Initial Space in the Initial Lease Period are approximately NIS 700,000 per month. During each of the additional lease option periods, the monthly lease and parking payments for the Initial Space will be increased by 2.5%. The monthly lease, parking and management costs for the Additional Space are expected to be approximately NIS 180,000 per month. The monthly lease, parking and management costs are linked to the Israeli consumer price index.

On February 3, 2019, we entered into a construction contractor agreement with A. Weiss Construction and Supervision Ltd. in order to set the terms under which the contractor will perform the main construction and adjustment works in connection our new Israeli Lease Agreement. The services include, among others, adjustments of electro-mechanical systems as well as works related to electricity, plumbing, air conditioning, flooring, cladding and carpentry, all in accordance with the specifications, plans and the quantities schedule (Ktav-Kamuyot) enclosed to the agreement. Following our transition to the new facilities, most of the obligations related to this agreement have already been executed and paid for. The agreement may be terminated by us for convenience, by providing to the Contractor a seven-day prior written notice.

10.D Exchange Controls

Israeli law and regulations do not impose any material foreign exchange restrictions on non-Israeli holders of our ordinary shares.

Dividends, if any, paid to holders of our ordinary shares, and any amounts payable upon our dissolution, liquidation or winding up, as well as the proceeds of any sale in Israel of our ordinary shares to an Israeli resident, may be paid in non-Israeli currency or, if paid in Israeli currency, may be converted into freely repatriable dollars at the rate of exchange prevailing at the time of conversion.

10.E Taxation

Israeli Taxation

The following is a summary of the material Israeli tax laws applicable to us, and some Israeli Government programs benefiting us. This section also contains a discussion of some Israeli tax consequences to persons owning our ordinary shares. This summary does not discuss all the aspects of Israeli tax law that may be relevant to a particular investor in light of his or her personal investment circumstances or to some types of investors subject to special treatment under Israeli law. Examples of this kind of investor include traders in securities who are subject to special tax regimes not covered in this discussion. Some parts of this discussion are based on a new tax legislation which has not been subject to judicial or administrative interpretation. The discussion should not be construed as legal or professional tax advice and does not cover all possible tax considerations.

SHAREHOLDERS ARE URGED TO CONSULT THEIR OWN TAX ADVISORS AS TO THE ISRAELI OR OTHER TAX CONSEQUENCES OF THE PURCHASE, OWNERSHIP AND DISPOSITION OF OUR ORDINARY SHARES, INCLUDING, IN PARTICULAR, THE EFFECT OF ANY FOREIGN, STATE OR LOCAL TAXES.

General Corporate Tax Structure in Israel

Israeli companies are generally subject to corporate tax on their taxable income at the rate of 23% for the 2018 tax year and thereafter. However, the effective tax rate payable by a company that derives income from an Approved Enterprise, a Beneficiary Enterprise, a Preferred Enterprise, a Special Preferred Enterprise, a Preferred Technology Enterprise or Special Preferred Technology Enterprise (as discussed below) may be lower. Capital gains derived by an Israeli company are generally subject to the prevailing regular corporate tax rate.

Income Tax Regulations (Rules on Bookkeeping by Foreign Invested Companies and Certain Partnerships and Determination of their Taxable Income), 1986

As a “foreign invested company” (as defined in the Israeli Law for the Encouragement of Capital Investments-1959), the Company's management has elected to apply Income Tax Regulations (Rules for Maintaining Accounting Records of Foreign Invested Companies and Certain Partnerships and Determining Their Taxable Income) - 1986. Accordingly, its taxable income or loss is calculated in US Dollars.

Tax Benefits under the Law for the Encouragement of Capital Investments, 1959

Tax benefits prior to the 2005 Amendment

The Law for the Encouragement of Capital Investments, 1959, generally referred to as the "Investments Law", provides that a capital investment in eligible facilities may, upon application to the Israeli Authority for Investments and Development of the Industry and Economy (the "Investment Center"), be granted the status of an Approved Enterprise. Each certificate of approval for an Approved Enterprise relates to a specific investment program delineated both by its financial scope, including sources or funds, and by its physical characteristics or the facility or other assets, e.g., the equipment to be purchased and utilized pursuant to the program.

A company owning an Approved Enterprise is eligible for a combination of grants and tax benefits (the "Grant Track"). The tax benefits under the Grant Track include, among others, accelerated depreciation and amortization for tax purposes. The benefits period is ordinarily seven years commencing with the year in which the Approved Enterprise first generates taxable income. The benefits period is limited to 12 years from the earlier of the commencement of production by the Approved Enterprise or 14 years from the date of approval of the Approved Enterprise.

A company owning an Approved Enterprise may elect to forego its entitlements to grants and tax benefits under the Grant Track and apply for alternative package of tax benefits for a benefit period of between seven and ten years (the "Alternative Track"). Under the Alternative Track, a company's undistributed income derived from the Approved Enterprise will be exempt from corporate tax for a period of between two and ten years, starting from the first year the company derives taxable income under the Approved Enterprise program. The length this exemption will depend on the geographic location of the Approved Enterprise within Israel. After the exemption period lapses, the company subject to tax at a reduced corporate tax rate between of 10% to 25% depending on the level of foreign investment in the company in each year for the remainder of the benefits period.

We elected to be taxed under the Alternative Track. A company that has elected the Alternative Track and subsequently pays a dividend out of income derived from the Approved Enterprise during the tax exemption period will be subject to corporate tax on the amount that is determined by the distributed amount (grossed up to reflect such pre-tax income that it would have had to earn in order to distribute the dividend) with the effective corporate tax rate which would have been applied had the company not elected the Alternative Track, which is at ranged between 10%-25%, depending on the level of foreign investment in the company in each year.

Under the Alternative Track, dividends paid by a company are considered to be attributable to income received from the entire company and the company's effective tax rate is the result of a weighted average of the various applicable tax rates, excluding any tax-exempt income. Under the Investments Law, a company that has elected the Alternative Track is not obliged to distribute retained profits, and may generally decide from which year's profits to declare dividends.

We currently intend to reinvest any income derived from our Approved Enterprise program and not to distribute such income as a dividend. See also Note 11B to our consolidated financial statements contained elsewhere in this report.

Tax benefits under the 2005 Amendment

An amendment to the Investments Law, which is effective as of April 1, 2005, has changed certain provisions of the Investments Law, or the 2005 Amendment. An eligible investment program under the 2005 Amendment qualifies for benefits as a "Beneficiary Enterprise" (rather than as an Approved Enterprise, which status is still applicable for investment programs approved prior to April 1, 2005 and/or investment programs under the Grant Track). According to the 2005 Amendment, only Approved Enterprises receiving cash grants require the prior approval of the Investment Center. As a result, a company is no longer required to obtain the advance approval of the Investment Center in order to receive the tax benefits previously available under the alternative benefits program. Rather, a company may claim the tax benefits offered by the Investment Law directly in its tax returns, provided that its facilities meet the criteria for tax benefits set forth in the 2005 Amendment. A company that has a Beneficiary Enterprise may, at its discretion, approach the ITA for a pre-ruling confirming that it is in compliance with the provisions of the Investment Law.

The duration of the tax benefits described herein is limited to the earlier of seven (7) or ten (10) years (depending on the geographic location of the Beneficiary Enterprise within Israel) from the Commencement Year (as described below) or 12 or 14 years from the first day of the Year of Election (as described below), depending on the location of the company within Israel. Commencement Year is defined as the later of the first tax year in which a company had derived liable income for tax purposes from the Beneficiary Enterprise, or the Year of Election, which is defined as the year in which a company requested to have the tax benefits apply to the Beneficiary Enterprise. The tax benefits granted to a Beneficiary Enterprise are determined, depending on the geographic location of the Beneficiary Enterprise within Israel.

Similar to the currently available Alternative Track, exemption from corporate tax may be available on undistributed income for a period of two to ten years, depending on the geographic location of the Beneficiary Enterprise within Israel, and a reduced corporate tax rate of 10% to 25% for the remainder of the benefits period, depending on the level of foreign investment in each year. If the company pays a dividend out of income derived from the Beneficiary Enterprise during the benefits period and such dividend is actually paid at any time up to 12 years thereafter, except with respect to foreign investment company (an "FIC"), in which case the 12-year limit does not apply, such income will be subject to withholding tax at the rate of 15% (or a lower rate under a tax treaty, if applicable, subject to the receipt in advance of a valid certificate from the ITA, allowing for a reduced tax rate). A Company that pays dividend out of income derived from the Beneficiary Enterprise during the tax exemption period will be subject to tax with respect to the amount distributed (grossed up to reflect such pre-tax income that it would have had to earn in order to distribute the dividend) at the corporate tax rate which would have otherwise been applicable; or

The benefits available to a Beneficiary Enterprise are subject to the continued fulfillment of conditions stipulated in the Investment Law and its regulations. If a company does not meet these conditions, it would be required to refund the amount of tax benefits, as adjusted by the Israeli consumer price index and interest, or other monetary penalty.

As a result of the 2005 Amendment, tax-exempt income generated under the provisions of the Investments Law, as amended, will subject us to taxes upon distribution or liquidation and we may be required to record deferred tax liability with respect to such tax-exempt income.

We had three Approved Enterprise plans under the Investments Law, which entitled us to certain tax benefits. In addition, in 2011, based on Company investments in property and equipment in the years 2008 and 2009, the Company submitted the applicable form as a Benefited Enterprise in accordance with the 2005 Amendment to the Investments Law. The year of election was 2010.

Tax benefits under the 2011 Amendment

On December 29, 2010, the Israeli Parliament approved the 2011 amendment to the Investments Law (the "2011 Amendment"). The 2011 Amendment significantly revised the tax incentive regime in Israel, commencing on January 1, 2011.

The 2011 Amendment introduced a new status of “Preferred Enterprise”, replacing the existed status of “Beneficiary Enterprise” and introduced new benefits for income generated by a “Preferred Company” through its Preferred Enterprise. A Preferred Company is an industrial company that meets certain conditions (including a minimum threshold of 25% export). However, under the 2011 Amendment the requirement for a minimum investment in productive assets in order to be eligible for the benefits granted under the Investments Law as with respect to “Beneficiary Enterprise” was cancelled.

A Preferred Company is entitled to a reduced flat tax rate with respect to the income attributed to the Preferred Enterprise, at the following rates:

Tax Year	Development Region “A”	Other Areas within Israel
2011-2012	10%	15%
2013	7%	12.5%
2014-2016	9%	16%
2017 onwards	7.5%	16%

* In December 2016, the Israeli Parliament (the Knesset) approved an amendment to the Investments Law pursuant to which the tax rate applicable to Preferred Enterprises in Development Region "A" would be reduced to 7.5% as of January 1, 2017.

The classification of income generated from the provision of usage rights in know-how or software that were developed in the Preferred Enterprise, as well as royalty income received with respect to such usage, as Preferred Enterprise income is subject to the issuance if a pre-ruling from the ITA stipulates that such income is associated with the productive activity of the Preferred Enterprise in Israel.

In addition, the 2011 Amendment introduced a new status of “Special Preferred Company” which is an Industrial company meeting, in addition to the conditions prescribed for “Preferred Company” certain additional conditions (including that the total Preferred Enterprise income is at least NIS 1.5 billion in 2016 and NIS 1 billion in 2017 and thereafter). The tax rate applicable for a period of 10 years to income generated by such an enterprise will be reduced to 5%, if located in Development Region “A”, or to 8%, if located in other area within the State of Israel.

Dividends distributed from income which is attributed to a “Preferred Enterprise” or a “Special Preferred Enterprise” will be subject to withholding tax at source at the following rates: (i) Israeli resident corporations – 0% (although, if such dividends are subsequently distributed to individuals or a non-Israeli company, withholding tax at a rate of 20% or such lower rate as may be provided in an applicable tax treaty will apply), (ii) Israeli resident individuals – 20% (iii) non-Israeli residents - 20% (or a lower rate under a tax treaty, if applicable, subject to the receipt in advance of a valid certificate from the ITA allowing for a reduced tax rate). In 2017 to 2019, dividends paid out of preferred income attributed to a Special Preferred Enterprise, directly to a foreign parent company, were subject to withholding tax at source at the rate of 5% (temporary provisions).

The 2011 Amendment also revised the Grant Track to apply only to the approved programs located in Development Region “A” and shall provide not only cash grants (as prior to the 2011 Amendment) but also the granting of loans. The rates for grants and loans shall not be fixed but up to 20% of the amount of the approved investment. In addition, a company owning a Preferred Enterprise under the Grant Track may be entitled also to the tax benefits which are prescribed for a Preferred Enterprise.

The provisions of the 2011 Amendment do not apply to existing “Beneficiary Enterprises” or “Approved Enterprises”, which will continue to be entitled to the tax benefits under the Investments Law, as has been in effect prior to the 2011 Amendment, unless the company owning such enterprises had made an election to apply the provisions of the 2011 Amendment (such election cannot be later rescinded), which is to be filed with the ITA, not later than the date prescribed for the filing of the company’s annual tax return for the respective year. A company owning a Beneficiary Enterprise or Approved Enterprise which made such election by June 30, 2015, will be entitled to distribute income generated by the Approved/Beneficiary Enterprise to its Israeli corporate shareholders tax free.

Until the end of 2015, we did not utilize tax benefits related to Preferred Enterprises. In 2016, we started utilizing such benefits, with a related tax rate which could range 12% to 16%.

The New Technological Enterprise Incentives Regime—the 2017 Amendment

The 2017 Amendment was enacted as part of the Economic Efficiency Law that was published on December 29, 2016, and became effective on January 1, 2017. The 2017 Amendment provides new tax benefits for two types of “Technology Enterprises”, as described below, and is in addition to the other existing tax beneficial programs under the Investment Law.

The new incentives regime will apply to “Preferred Technological Enterprises” that meet certain conditions, including: (1) the R&D expenses in the three years preceding the tax year were at least 7% on average of one year out of the company's turnover or exceeded NIS 75 million (approximately $21 million) for a year; and (2) one of the following: (a) at least 20% of the workforce (or at least 200 employees) are employees whose full salary has been paid and reported in the Company’s financial statements as R&D expenses; (b) a venture capital investment approximately equivalent to at least NIS 8 million was previously made in the company and the company did not change its line of business; (c) growth in sales by an average of 25% or more, over the three years preceding the tax year, provided that the turnover was at least NIS 10 million (approximately $2.8 million), in the tax year and in each of the preceding three years; or (d) growth in workforce by an average of 25% or more, over the three years preceding the tax year, provided that the company employed at least 50 employees, in the tax year and in each of the preceding three years.

A “Special Preferred Technological Enterprise” is an enterprise that meets conditions 1 and 2 above, and in addition has total annual consolidated revenues at least NIS 10 billion (approximately $2.8 billion).

Preferred Technological Enterprises will be subject to a reduced corporate tax rate of 12% on their income that qualifies as “Preferred Technology Income”, as defined in the Investment Law. The tax rate is further reduced to 7.5% for a Preferred Technology Enterprise located in Development Region "A". These corporate tax rates shall apply only with respect to the portion of intellectual property developed in Israel. In addition, a Preferred Technology Company will enjoy a reduced corporate tax rate of 12% on capital gain derived from the sale of certain “Benefited Intangible Assets” (as defined in the Investment Law) to a related foreign company if the Benefited Intangible Assets were acquired from a foreign company on or after January 1, 2017 for at least NIS 200 million (approximately $56 million), and the sale receives prior approval from the IIA. Special Preferred Technological Enterprises will be subject to 6% on “Preferred Technology Income” regardless of the company’s geographic location within Israel.

In addition, a Special Preferred Technology Enterprise will enjoy a reduced corporate tax rate of 6% on capital gain derived from the sale of certain "Beneficiary Intangible Assets" to a related foreign company if the Beneficiary Intangible Assets were either developed by the Special Preferred Technology Enterprise or acquired from a foreign company on or after January 1, 2017, and the sale received prior approval from the IIA.

A Special Preferred Technology Enterprise that acquires Benefited Intangible Assets from a foreign company for more than NIS 500 million (approximately $142 million), will be eligible for these benefits for at least ten years, subject to certain approvals as specified in the Investment Law.

Dividends distributed by a Preferred Technology Enterprise or a Special Preferred Technology Enterprise, paid out of Preferred Technology Income, are generally subject to withholding tax at source at the rate of 20% or such lower rate as may be provided in an applicable tax treaty (subject to the receipt in advance of a valid certificate from the ITA allowing for a reduced tax rate). However, if such dividends are paid to an Israeli company, no tax is required to be withheld. If such dividends are, distributed to a foreign company that holds solely or together with other foreign companies at least 90% of the shares of the distributing company and other conditions are met, the withholding tax rate will be 4% (or a lower rate under a tax treaty, if applicable, subject to the receipt in advance of a valid certificate from the ITA allowing for a reduced tax rate).

We reviewed the criteria for the tax rate of a "Special Preferred Technological Enterprise" and concluded that we are entitled to the reduced tax rate under the "Preferred Technological Enterprises" tax incentive regime starting 2017. We have notified the ITA that we elected applying this status starting 2017. We cannot asses at this stage the ITA position.

Law for the Encouragement of Industry (Taxes), 5729-1969

The Law for the Encouragement of Industry (Taxes), 1969, or the Industry Encouragement Law defines "Industrial Company" as an Israeli resident company which was incorporated in Israel, of which 90% or more of its income in any tax year (exclusive of income from certain government loans) is generated from an "Industrial Enterprise" that it owns and located in Israel or in the "Area", in accordance with the definition under section 3A of the Israeli Income Tax Ordinance (New Version) 1961, or the Ordinance. An "Industrial Enterprise" is defined as an enterprise whose principal activity in a given tax year is industrial manufacturing.

An Industrial Company is entitled to certain tax benefits, including: (i) an amortization of the cost of purchased patent, the right to use patent or know-how that were purchased in good faith and are used for the development or promotion of the Industrial Enterprise, over an eight-year period, beginning from the year in which such rights were first used, (ii) the right to elect to file consolidated tax returns with additional Israeli Industrial Companies controlled by it, and (iii) the right to deduct expenses related to public offerings in equal amounts over a period of three years beginning from the year of the offering.

Eligibility for benefits under the Encouragement of Industry Law is not contingent upon the approval of any governmental authority.

We believe that we qualify as an "Industrial Company" within the meaning of the Industry Encouragement Law. There is no assurance that we qualify or will continue to qualify as an Industrial Company or that the benefits described above will be available to us in the future.

Taxation of the Company Shareholders

Capital Gains

Capital gain tax is imposed on the disposition of capital assets by an Israeli resident, and on the disposition of such assets by a non-Israel resident if those assets are either (i) located in Israel; (ii) are shares or a right to a share in an Israeli resident corporation, or (iii) represent, directly or indirectly, rights to assets located in Israel, unless a tax treaty between Israel and the seller's country of residence provides otherwise. The Ordinance distinguishes between "Real Gain" and the "Inflationary Surplus". Real Gain is the excess of the total capital gain over Inflationary Surplus computed generally on the basis of the increase in the Israeli Consumer Price Index (CPI) or, in certain circumstances, according to the change in the foreign currency exchange rate, between the date of purchase and the date of disposition.

Generally, the capital gain accrued by individuals on the sale of our ordinary shares will be taxed at the rate of 25%. However, if the individual shareholder is a "Controlling Shareholder" (i.e., a person who holds, directly or indirectly, alone or together with such person's relative or another person who collaborates with such person on a permanent basis, 10% or more of one of the Israeli resident company's means of control) at the time of sale or at any time during the preceding twelve (12) months period, such gain will be taxed at the rate of 30%.

The Real Gain derived by corporations will be generally subject to the ordinary corporate tax (23% in 2018 and thereafter).

Individual and corporate shareholder dealing in securities in Israel are taxed at the tax rates applicable to business income – 23% for corporations in 2018 and thereafter and a marginal tax rate of up to 47% in 2019 for individuals, unless the benefiting provisions of an applicable treaty applies.

Notwithstanding the foregoing, capital gain derived from the sale of our ordinary shares by a non-Israeli shareholder may be exempt under the Ordinance from Israeli taxation provided that the following cumulative conditions, among other things, are met: (i) the shares were purchased upon or after the registration of the securities on the stock exchange, (ii) the seller does not have a permanent establishment in Israel to which the derived capital gain is attributed. ; and (iii) with respect our ordinary shares listed on a recognized stock exchange outside of Israel, so long as neither the shareholder nor the particular capital gain is otherwise subject to the Israeli Income Tax Law (Inflationary Adjustments) 5745-1985. Non-Israeli corporations will not be entitled to the foregoing exemptions if (i) an Israeli resident has a controlling interest, directly or indirectly, alone or together with another (i.e., together with a relative, or together with someone who is not a relative but with whom, according to an agreement, there is regular cooperation in material matters of the company, directly or indirectly), or together with another Israeli resident, exceed 25% in one or more of the means of control in such non-Israeli resident corporation or (ii) Israeli residents are the beneficiaries of, or are entitled to, 25% or more of the revenues or profits of such non-Israeli resident corporation, whether directly or indirectly.

In addition, the sale of shares may be exempt from Israeli capital gain tax under the provisions of an applicable tax treaty. For example, the U.S.-Israel Double Tax Treaty exempts U.S. resident from Israeli capital gain tax in connection with such sale, exchange or disposition provided, among others (i) the U.S. resident owned, directly or indirectly, less than 10% of an Israeli resident company's voting power at any time within the 12 month period preceding such sale; (ii) the seller, being an individual, is present in Israel for a period or periods of less than 183 days in the aggregate at the taxable year; and (iii) the capital gain from the sale was not derived through a permanent establishment of the U.S. resident which is maintained in Israel the capital gain arising from such sale, exchange or disposition is not attributed to real estate located in Israel; (v) the capital gains arising from such sale, exchange or disposition is not attributed to royalties; and (vi) the shareholder is a U.S. resident (for purposes of the U.S.-Israel Double Tax Treaty) is holding the shares as a capital asset.

Either the purchaser, the stockbrokers or financial institution, through which payment to the seller is made, are obliged, subject to the above-mentioned exemptions, to withhold Israeli tax at source from such payment. Shareholders may be required to demonstrate that they are exempt from tax on their capital gains in order to avoid withholding at source at the time of sale. Specifically, in transactions involving a sale of all of the shares of an Israeli resident company, in the form of a merger or otherwise, the ITA may require from shareholders who are not liable for Israeli tax to sign declarations in forms specified by this authority or obtain a specific exemption from the ITA to confirm their status as non-Israeli resident.

At the sale of securities traded on a stock exchange a detailed return, including a computation of the tax due, must be filed and an advanced payment must be paid on January 31 and July 31 of every tax year in respect of sales of securities made within the previous six months. However, if all tax due was withheld at source according to applicable provisions of the Ordinance and regulations promulgated thereunder the aforementioned return need not be filed and no advance payment must be paid. Capital gain is also reportable on the annual income tax return.

Dividends

A distribution of dividends from income, which is not attributed to an Approved Enterprise/Beneficiary Enterprise/Preferred Enterprise to an Israeli resident individual, will generally be subject to income tax at a rate of 25%. However, a 30% tax rate will apply if the dividend recipient is a “Controlling Shareholder” (as defined above) at the time of distribution or at any time during the preceding 12 months period. If the recipient of the dividend is an Israeli resident corporation, such dividend will be exempt from income tax provided the income from which such dividend is distributed was derived or accrued within Israel.

Distribution of dividends from income attributed to a Preferred Enterprise is generally subject to a withholding tax at source at the rate of 20%. However, if such dividends are distributed to an Israeli company, no withholding tax is imposed (although, if such dividends are subsequently distributed to individuals or a non-Israeli company, withholding tax at a rate of 20% or such lower rate as may be provided in an applicable tax treaty will apply (subject to the receipt in advance of a valid certificate from the Israel Tax Authority allowing for an exemption). Dividends distributed from income attributed to an Approved Enterprise and/or a Beneficiary Enterprise are generally subject to a withholding tax at source at the rate of 15%. Those rates may be further reduced under the provisions of any applicable double tax treaty (subject to the receipt in advance of a valid certificate from the ITA allowing for a reduced tax rate).

The Ordinance generally provides that a non-Israeli resident (either individual or corporation) is subject to an Israeli income tax on the receipt of dividends at the rate of 25% (30% if the dividends recipient is a "Controlling Shareholder" (as defined above), at the time of distribution or at any time during the preceding 12 months period); those rates are subject to a reduced tax rate under the provisions of an applicable double tax treaty (subject to the receipt in advance of a valid certificate from the ITA allowing for a reduced tax rate). For example, under the U.S.-Israel Double Tax Treaty the following rates will apply in respect of dividends distributed by an Israeli resident company to a U.S. resident: (i) if the U.S. resident is a corporation which holds during that portion of the taxable year which precedes the date of payment of the dividend and during the whole of its prior taxable year (if any), at least 10% of the outstanding shares of the voting stock of the Israeli resident paying corporation and not more than 25% of the gross income of the Israeli resident paying corporation for such prior taxable year (if any) consists of certain type of interest or dividends – the maximum tax rate is 12.5% on dividends, not generated by an Approved Enterprise or Beneficiary Enterprise, (ii) if both the conditions mentioned in section (i) above are met and the dividend is paid from an Israeli resident company's income which was entitled to a reduced tax rate applicable to an Approved Enterprise or Beneficiary Enterprise – the tax rate is 15%, and (iii) in all other cases, the tax rate is 25%, or the domestic rate (if such is lower). The aforementioned rates under the U.S.-Israel Double Tax Treaty will not apply if the dividend income was derived through a permanent establishment of the U.S. resident maintained in Israel.

If the dividend is attributable partly to income derived from an Approved Enterprise, a Beneficiary Enterprise or a Preferred Enterprise, and partly to other sources of income, the withholding rate will be a blended rate reflecting the relative portions of the two types of income.

Payors of dividends on our shares, including the Israeli stockbroker effectuating the transaction, or the financial institution through which the securities are held, are generally required, subject to any of the foregoing exemption, reduced tax rates and the demonstration of a shareholder of his, her or its foreign residency, to withhold taxes upon the distribution of dividends at a rate of 25%, provided that the shares are registered with a Nominee Company (for corporations and individuals, whether the recipient is a Controlling Shareholder or not).

A non-Israeli resident who receives dividends from which tax was withheld is generally exempt from the obligation to file tax returns in Israel with respect to such income, provided that (i) such income was not generated from business conducted in Israel by the taxpayer, (ii) the taxpayer has no other taxable sources of income in Israel with respect to which a tax return is required to be filed, and (iii) the taxpayer is not obligated to pay excess tax (as further explained below).

Excess Tax

Individuals who are subject to tax in Israel are also subject to an additional tax at a rate of 3% on annual income exceeding NIS 649,560 for 2019 and thereafter, which amount is linked to the Israeli Consumer Price Index)), including, but not limited to income derived from dividends, interest and capital gains.

Foreign Exchange Regulations

Non-residents of Israel who hold our ordinary shares are able to receive any dividends, and any amounts payable upon the dissolution, liquidation and winding up of our affairs, repayable in non-Israeli currency at the rate of exchange prevailing at the time of conversion. However, Israeli income tax is generally required to have been paid or withheld on these amounts. In addition, the statutory framework for the potential imposition of currency exchange control has not been eliminated, and may be restored at any time by administrative action.

U.S. Taxation

The following discussion describes certain material United States ("U.S.") federal income tax consequences generally applicable to U.S. holders (as defined below) of the purchase, ownership and disposition of our ordinary shares. This summary addresses only holders who acquire and hold ordinary shares as "capital assets" for U.S. federal income tax purposes (generally, assets held for investment purposes).

For purposes of this discussion, a "U.S. holder" is a beneficial owner of ordinary shares who is:

- An individual citizen or resident of the U.S. (as determined under U.S. federal income tax rules);
- a corporation (or another entity taxable as a corporation for U.S. federal income tax purposes) created or organized in or under the laws of the U.S., any state thereof, or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income taxation regardless of its source; or
- a trust, if (a) a U.S. court is able to exercise primary supervision over its administration and one or more U.S. persons have the authority to control all of its substantial decisions; or (b) the trust has in effect a valid election in effect under applicable Treasury Regulations (as defined below) to be treated as a United States person.

This summary is for general information purposes only and does not purport to be a comprehensive description of all of the U.S. federal income tax considerations that may be relevant to a decision to purchase, hold or dispose of the Company's ordinary shares. In addition, the possible application of U.S. federal estate or gift taxes or any aspect of state, local or non-U.S. tax laws is not considered. This discussion is based on current provisions of the Internal Revenue Code of 1986, as amended (the "Code"), Treasury Regulations promulgated under the Code by the U.S. Treasury Department (including proposed and temporary regulations) (the "Treasury Regulations"), rulings, current administrative interpretations and official pronouncements by the Internal Revenue Service (the "IRS"), and judicial decisions, all as currently in effect and all of which are subject to differing interpretations or to change, with a retroactive effect. Such changes could materially and adversely affect the tax consequences described below. No assurance can be given that the IRS would not assert, or that a court would not sustain, a position contrary to any of the tax consequences described below.

This discussion does not address all aspects of U.S. federal income taxation that may be relevant to any particular U.S. holder based on the holder's particular circumstances, including, but not limited to:

- persons who own, directly, indirectly or constructively, 10% or more (by voting power or value) of our outstanding voting shares;
- persons who hold the ordinary shares as part of a hedging, straddle or conversion transaction;
- persons whose functional currency is not the U.S. dollar;
- persons who acquire their ordinary shares in a compensatory transaction;
- broker-dealers;

- insurance companies;
- regulated investment companies;
- real estate investment companies;
- qualified retirement plans, individual retirement accounts and other tax-deferred accounts;
- traders who elect to mark-to-market their securities;
- tax-exempt organizations;
- banks or other financial institutions;
- persons subject to special tax accounting rules as a result of any item of gross income with respect to ordinary shares being taken into account in an applicable financial statement;
- U.S. expatriates and certain former citizens and long-term residents of the United States; and
- persons subject to the alternative minimum tax.

The tax treatment of a partner in a partnership (or other entity or arrangement classified as a partnership for U.S. federal income tax purposes) may depend on both the partnership's and the partner's status and the activities of the partnership. Partnerships (or other entities or arrangements classified as a partnership for U.S. federal income tax purposes) that are beneficial owners of ordinary shares, and their partners and other owners, should consult their own tax advisers regarding the tax consequences of the acquisition, ownership and disposition of ordinary shares.

THIS SUMMARY OF MATERIAL UNITED STATES FEDERAL INCOME TAX CONSIDERATIONS IS FOR GENERAL INFORMATION ONLY AND IS NOT TAX ADVICE. EACH HOLDER SHOULD CONSULT ITS TAX ADVISOR WITH RESPECT TO THE PARTICULAR TAX CONSEQUENCES TO IT OF AN INVESTMENT IN THE ORDINARY SHARES, INCLUDING THE EFFECTS OF APPLICABLE UNITED STATES FEDERAL INCOME TAX LAWS AS WELL AS ANY TAX CONSEQUENCES ARISING UNDER THE UNITED STATES FEDERAL ESTATE OR GIFT TAX RULES OR UNDER THE LAWS OF ANY FOREIGN, STATE OR LOCAL JURISDICTION OR UNDER ANY APPLICABLE TAX TREATY.

Distributions on the Ordinary Shares

We currently do not intend to distribute dividends for at least the next several years. However, if we make any distributions of cash or other property to a U.S. holder of our ordinary shares, the amount of the distribution for U.S. federal income tax purposes will equal the amount of cash and the fair market value of any property distributed and will also include the amount of Israeli taxes withheld, if any, as described above under "[Israel Taxation] — Dividends" above. In general (and subject to the PFIC rules discussed below), any distribution paid by us on the ordinary shares to a U.S. holder will be treated as dividend income to the extent the distribution does not exceed our current and/or accumulated earnings and profits, as determined under U.S. federal income tax principles. The amount of any distribution which exceeds these earnings and profits will be treated first as a non-taxable return of capital, reducing the U.S. holder's tax basis in its ordinary shares to the extent thereof, and then as capital gain income (long-term capital gain if the U.S. holder's holding period exceeds one year), from the deemed disposition of the ordinary shares (subject to the PFIC rules discussed below). Corporate holders generally will not be allowed a deduction for dividends received on the ordinary shares.

The amount of any dividend paid in NIS (including amounts withheld to pay Israeli withholding taxes) will equal the U.S. dollar value of the NIS calculated by reference to the exchange rate in effect on the date the dividend is received by the U.S. holder, regardless of whether the NIS are converted into U.S. dollars. A U.S. holder will have a tax basis in the NIS equal to their U.S. dollar value on the date of receipt. If the NIS received are converted into U.S. dollars on the date of receipt, the U.S. holder should generally not be required to recognize foreign currency gain or loss in respect of the distribution. If the NIS received are not converted into U.S. dollars on the date of receipt, a U.S. holder may recognize foreign currency gain or loss on a subsequent conversion or other disposition of the NIS. Such gain or loss will be treated as U.S. source ordinary income or loss.

Dividends paid by us generally will be foreign source, "passive income" for U.S. foreign tax credit purposes. U.S. holders may elect to claim as a foreign tax credit against their U.S. federal income tax liability the Israeli income tax withheld from dividends received on the ordinary shares. The Code provides limitations on the amount of foreign tax credits that a U.S. holder may claim. U.S. holders that do not elect to claim a foreign tax credit may instead claim a deduction for Israeli income tax withheld, but only for a year in which these U.S. holders elect to do so for all foreign income taxes. The rules relating to foreign tax credits are complex (and may also be impacted by the tax treaty between the United States and Israel), and you should consult your tax advisor to determine whether you would be entitled to this credit.

Under current law, certain distributions treated as dividends that are received by an individual U.S. holder from a "qualified foreign corporation" generally qualify for a 20% reduced maximum tax rate so long as certain holding period and other requirements are met. A non-U.S. corporation (other than a corporation that is treated as a PFIC with respect to the U.S. holder for the taxable year in which the dividend is paid or the preceding taxable year) generally will be considered to be a qualified foreign corporation (i) if it is eligible for the benefits of a comprehensive tax treaty with the United States which the Secretary of Treasury of the United States determines is satisfactory for purposes of this provision and which includes an exchange of information program, or (ii) with respect to any dividend it pays on stock which is readily tradable on an established securities market in the United States. Dividends paid by us in a taxable year in which we are not a PFIC and with respect to which we were not a PFIC in the preceding taxable year with respect to the U.S. holder are expected to be eligible for the 20% reduced maximum tax rate, although we can offer no assurances in this regard. However, any dividend paid by us in a taxable year in which we are a PFIC or were a PFIC in the preceding taxable year with respect to the U.S. holder will be subject to tax at regular ordinary income rates (along with any applicable additional PFIC tax liability, as discussed below).

The additional 3.8% tax on "net investment income" (described below) may apply to dividends received by certain U.S. holders who meet certain modified adjusted gross income thresholds.

Sale, Exchange or Other Taxable Disposition of the Ordinary Shares

Upon the sale, exchange or other taxable disposition of the ordinary shares (subject to the PFIC rules discussed below), a U.S. holder generally will recognize capital gain or loss in an amount equal to the difference between the amount realized and the U.S. holder's tax basis in the ordinary shares. The gain or loss recognized on the sale or exchange of the ordinary shares generally will be long-term capital gain (currently taxable at a reduced rate for non-corporate U.S. holders) or loss if the U.S. holder's holding period of the ordinary shares is more than one year at the time of the disposition. The deductibility of capital losses is subject to limitations.

Gain or loss recognized by a U.S. holder on a sale or exchange of ordinary shares generally will be treated as U.S. source income or loss for U.S. foreign tax credit purposes. Under the tax treaty between the United States and Israel, gain derived from the sale, exchange or other taxable disposition of ordinary shares by a holder who is a resident of the U.S. for purposes of the treaty and who sells the ordinary shares within Israel may be treated as foreign source income for U.S. foreign tax credit purposes.

The additional 3.8% tax on "net investment income" (described below) may apply to certain U.S. holders who meet certain modified adjusted gross income thresholds, including capital gains.

Passive Foreign Investment Companies

In general, a foreign (i.e., non-U.S.) corporation will be a PFIC for any taxable year in which, after applying the relevant look-through rules with respect to the income and assets of its subsidiaries, either (1) 75% or more of its gross income in the taxable year is "passive income," or (2) assets held for the production of, or that produce, passive income comprise 50% or more of the average of its total asset value in the taxable year. For purpose of the income test, passive income generally includes dividends, interest, royalties, rents, annuities and net gains from the disposition of assets, which produce passive income. For purposes of the asset test, assets held for the production of passive income includes assets held for the production of, or that produce dividends, interest, royalties, rents, annuities, and other income that are considered passive income for purposes of the income test. In determining whether we meet the asset test, cash is considered a passive asset and the total value of our assets generally will be treated as equal to the sum of the aggregate fair market value of our outstanding stock plus our liabilities. If we own at least 25% (by value) of the stock of another corporation, we will be treated, for purposes of the PFIC tests, as owning our proportionate share of the other corporation's assets and receiving our proportionate share of the other corporation's income. The income test is conducted at the taxable year-end. The asset test is conducted on a quarterly basis and the quarterly results are then averaged together.

If a corporation is treated as a PFIC for any year during a U.S. holder's holding period and the U.S. holder does not timely elect to treat the corporation as a "qualified electing fund" under Section 1295 of the Code or elect to mark its ordinary shares to market (both elections described below), any gain on the disposition of the shares will be treated as ordinary income, rather than capital gain, and the holder will be required to compute its 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. The portion of the gain and distributions allocated to prior taxable years in which a corporation was a PFIC will be ineligible for any preferential tax rate otherwise applicable to any "qualified dividend income" or capital gains, and will be taxed at the highest ordinary income tax rate in effect for each taxable year to which this portion is allocated. An interest charge will be imposed on the amount of the tax allocated to these taxable years. A U.S. holder may elect to treat a corporation as a qualified electing fund only if the corporation complies with requirements imposed by the IRS to enable the shareholder and the IRS to determine the corporation's ordinary earnings and net capital gain. Additionally, if a corporation is a PFIC, a U.S. holder who acquires shares in the corporation from a decedent generally will be denied the normally available step-up in tax basis to fair market value for the shares at the date of death of the decedent and instead will have a tax basis equal to the decedent's tax basis if lower than fair market value. These adverse tax consequences associated with PFIC status could result in a material increase in the amount of tax that a U.S. holder would owe and an imposition of tax earlier than would otherwise be imposed and additional tax form filing requirements. Unless otherwise provided by the IRS, if a corporation is classified as a PFIC, a U.S. person that is a direct or indirect holder generally will be required to file IRS Form 8621, Information Return by a Shareholder of a Passive Foreign Investment Company or Qualified Electing Fund, or any applicable successor form, to report its ownership interest in such entity.

Status of Nova as a PFIC. Under the income test, less than 75% of our gross income was passive income in 2019. Under the asset test, while we continued to have substantial amounts of cash and short-term deposits and the market value of our ordinary shares continued to be volatile, a determination of the value of our assets by reference to the average market value of our ordinary shares and our liabilities results in a conclusion that the average value of our passive assets did not exceed 50% of the average value of our gross assets in 2019. Nonetheless, there is a risk that we were a PFIC in 2019 or we will be a PFIC in 2020 or subsequent years. For example, taking into account our existing cash balances, if the value of our stock were to decline materially, it is possible that we could become a PFIC in 2020 or a subsequent year. Additionally, due to the complexity of the PFIC provisions and the limited authority available to interpret such provisions, there can be no assurance that our determination regarding our PFIC status could not be successfully challenged by the IRS.

Available Elections. If we become a PFIC for any taxable year, an election to treat us as a "qualified electing fund" or to "mark-to-market" our ordinary shares may mitigate the adverse tax consequences of PFIC status to a U.S. holder.

If a U.S. holder makes a qualified electing fund election (a "QEF election") for its ordinary shares that is effective from the first taxable year that the U.S. holder holds our ordinary shares and during which we are a PFIC, the electing U.S. holder will avoid the adverse consequences of our being classified as a PFIC, but will instead be required to include in income a pro rata share of our net capital gain, if any, and other earnings and profits ("ordinary earnings") as long-term capital gains and ordinary income, respectively, on a current basis, in each case whether or not distributed, in the taxable year of the U.S. holder in which or with which our taxable year ends. A subsequent distribution of amounts that were previously included in the gross income of U.S. holders should not be taxable as a dividend to those U.S. holders who made a QEF election. In the event we incur a net loss for a taxable year, such loss will not be available as a deduction to an electing U.S. holder, and may not be carried forward or back in computing our net capital gain or ordinary earnings in other taxable years. The tax basis of the shares of an electing U.S. holder generally will be increased by amounts that are included in income, and decreased by amounts distributed but not taxed as dividends, under the QEF rules described above. In order to make (or maintain) a QEF election, the U.S. holder must annually complete and file IRS Form 8621, Information Return by a Shareholder of a Passive Foreign Investment Company or Qualified Electing Fund, or any applicable successor form. However, we do not expect that we will prepare or provide to U.S. Holders a "PFIC annual information statement," which would enable a U.S. Holder to make a QEF election.

Alternatively, if a U.S. holder elects to "mark-to-market" its ordinary shares, the U.S. holder generally will include in its income any excess of the fair market value of our ordinary shares at the close of each taxable year over the holder's adjusted basis in such ordinary shares. A U.S. holder generally will be allowed an ordinary deduction for the excess, if any, of the adjusted tax basis of the ordinary shares over the fair market value of the ordinary shares as of the close of the taxable year, or the amount of any net mark-to-market gains recognized for prior taxable years, whichever is less. A U.S. holder's adjusted tax basis in the ordinary shares generally will be adjusted to reflect the amounts included or deducted under the mark-to-market election. Additionally, any gain on the actual sale or other disposition of the ordinary shares generally will be treated as ordinary income. Ordinary loss treatment also will apply to any loss recognized on the actual sale or other disposition of ordinary shares to the extent that the amount of such loss does not exceed the net mark-to-market gains previously included with respect to such ordinary shares. If a U.S. holder makes a valid mark-to-market election with respect to our ordinary shares for the first taxable year of the U.S. holder in which the U.S. holder holds (or is deemed to hold) our ordinary shares and for which we are determined to be a PFIC, such holder generally will not be subject to the PFIC rules described above in respect of its ordinary shares. A mark-to-market election applies to the tax year for which the election is made and to each subsequent year, unless our ordinary shares cease to be marketable, as specifically defined, or the IRS consents to revocation of the election. No view is expressed regarding whether our ordinary shares are marketable for these purposes or whether the election will be available.

If a U.S. holder makes either the QEF election or the mark-to-market election, distributions and gain will not be recognized ratably over the U.S. holder's holding period or be subject to an interest charge as described above. Further, the denial of basis step-up at death described above will not apply. If a U.S. holder makes the QEF election, gain on the sale of the ordinary shares will be characterized as capital gain. However, U.S. holders making one of these two elections may experience current income recognition, even if we do not distribute any cash. The elections must be made with the U.S. holder's federal income tax return for the year of election, filed by the due date of the return (as it may be extended) or, under certain circumstances provided in applicable Treasury Regulations, subsequent to that date.

The foregoing discussion relating to the QEF election and mark-to-market elections assumes that a U.S. holder makes the applicable election with respect to the first year in which Nova qualifies as a PFIC. If the election is not made for the first year in which Nova qualifies as a PFIC, the procedures for making the election and the consequences of election will be different.

SPECIFIC RULES AND REQUIREMENTS APPLY TO BOTH THE QEF ELECTION AND THE MARK-TO-MARKET ELECTION, AND YOU ARE URGED TO CONSULT YOUR TAX ADVISOR CONCERNING OUR PFIC STATUS AND THE VARIOUS ELECTIONS YOU CAN MAKE.

Medicare Tax on Net Investment Income

A U.S. holder that is an individual or estate, or a trust that does not fall into a special class of trusts that is exempt from such tax, will be subject to a 3.8% tax on the lesser of (1) the U.S. holder's "net investment income" for the relevant taxable year and (2) the excess of the U.S. holder's modified adjusted gross income for the taxable year over a certain threshold. A U.S. holder's "net investment income" generally may include its dividend income and its net gains from the disposition of shares, unless such dividends or net gains are derived in the ordinary course of the conduct of a trade or business (other than a trade or business that consists of certain passive or trading activities). If you are a U.S. holder that is an individual, estate or trust, you are urged to consult your tax advisors regarding the applicability of the Medicare tax to your income and gains in respect of your investment in the shares and the interaction of these rules with the rules applicable to income included as a result of the QEF election.

United States Information Reporting and Backup Withholding

In general, U.S. holders may be subject to certain information reporting requirements under the Code relating to their purchase and/or ownership of stock of a foreign corporation such as the Company. Failure to comply with these information reporting requirements may result in substantial penalties.

Specifically, certain U.S. Holders holding specified foreign financial assets, including our ordinary shares, with an aggregate value in excess of the applicable U.S. dollar threshold, are subject to certain exceptions, required to report information relating to our Ordinary Shares by attaching a complete IRS Form 8938, Statement of Specified Foreign Financial Assets, to their tax returns, for each year in which they hold our ordinary shares. U.S. Holders are urged to consult their own tax advisors regarding information reporting requirements relating to the ownership of our Ordinary Shares.

In addition, and as discussed in the section of this annual report entitled "U.S. Taxation – Passive Foreign Investment Companies", if a corporation is classified as a PFIC, a U.S. person that is a direct or indirect holder generally will be required to file an informational return annually on IRS Form 8621, Information Return by a Shareholder of a Passive Foreign Investment Company or Qualified Electing Fund, or any applicable successor form, to report its ownership interest in such entity, unless otherwise provided by the IRS.

Dividend payments and proceeds from the sale or disposal of ordinary shares may be subject to information reporting to the IRS and possible U.S. federal backup withholding. Certain holders (including, among others, corporations) generally are not subject to information reporting and backup withholding. A U.S. holder generally will be subject to backup withholding if such holder is not otherwise exempt and such holder:

- fails to furnish its taxpayer identification number, or TIN, which, for an individual, is ordinarily his or her social security number;
- furnishes an incorrect TIN;
- is notified by the IRS that it is subject to backup withholding because it has previously failed to properly report payments of interest or dividends; or
- fails to certify, under penalties of perjury, that it has furnished a correct TIN and that the IRS has not notified the U.S. holder that it is subject to backup withholding.

Any U.S. holder who is required to establish exempt status generally must file IRS Form W-9 ("Request for Taxpayer Identification Number and Certification").

Backup withholding is not an additional tax and may be claimed as a refund or a credit against the U.S. federal income tax liability of a U.S. Holder, provided that the required information is timely furnished to the IRS.

10.F Dividends and Paying Agents

Not applicable.

10.G Statements by Experts

Not applicable.

10.H Documents on Display

As a foreign private issuer, are exempt from the rules under the Exchange Act related to the furnishing and content of proxy statements, and our officers, directors and principal shareholders are exempt from the reporting and short-swing profit recovery provisions contained in Section 16 of the Exchange Act. Furthermore, as a foreign private issuer, we are also not subject to the requirements of Regulation FD (Fair Disclosure) promulgated under the Exchange Act. In addition, we are not be required under the Exchange Act to file annual or other reports and consolidated financial statements with the SEC as frequently or as promptly as U.S. companies whose securities are registered under the Exchange Act. Instead, we must file with the SEC, within 120 days after the end of each fiscal year, or such other applicable time as required by the SEC, an annual report on Form 20-F containing consolidated financial statements audited by an independent registered public accounting firm. We also intend to furnish certain other material information to the SEC under cover of Form 6-K.

We maintain a corporate website at www.novami.com. Information contained on, or that can be accessed through, our website does not constitute a part of this annual report on Form 20-F. We have included our website address in this annual report on Form 20-F solely as an inactive textual reference.

10.I Subsidiary Information

Not applicable.

Item 11. Quantitative and Qualitative Disclosures About Market Risk

Market Risk

Market risk represents the risk of loss that may impact the consolidated financial position, results of operations or cash flows of the Company. The Company is exposed to market risk in the area of foreign exchange rates, as described below.

The Company does not utilize financial instruments for trading purposes and holds no derivative financial instruments that could expose it to significant market risk.

Impact of Currency Fluctuation

Because our results are reported in U.S. Dollars, changes in the rate of exchange between the Dollar and local currencies in those countries in which we operate (primarily the NIS) will affect the results of our operations. The dollar cost of our operations in countries other than the U.S., is negatively influenced by revaluation of the U.S. dollar against other currencies. During 2019, the value of the U.S. dollar devaluated against the NIS by approximately 7.8% As of December 31, 2019, the majority of our net monetary assets were denominated in dollars and the remainder was denominated mainly in NIS. Net monetary assets that are not denominated in dollars or dollar-linked NIS were affected by the currency fluctuations in 2019 and are expected to continue to be affected by such currency fluctuations in 2020. As of December 31 ,2019 the Company recorded a NIS and Israel CPI linked lease liability, under the implementation of ASC 842 in the amount of $22 million (including exchange rate differences of $1.4 million).

In 2018, we entered into currency-forward transactions and currency-put options (NIS/dollar) of approximately $77 million with settlement dates through 2018-2019, designed to reduce cash-flow exposure to the impact of exchange-rate fluctuations on firm commitments of approximately $77 million. In accordance with ASC 815-10, we recorded in 2018 a decrease of approximately $0.3 million in fair market value in "Other Comprehensive Income". Short-term exposures to changing foreign exchange rates are primarily due to operating cash flows denominated in foreign currencies and transactions denominated in non-functional currencies. Our most significant foreign currency exposures are related to our operations in Israel. We have used foreign exchange forward contracts to partially cover known and anticipated exposures. We estimate that an instantaneous 10% depreciation in NIS from its level against the dollar as of December 31, 2018, with all other variables held constant, would increase the fair value of our net assets denominated in foreign currency, held at December 31, 2018, by approximately $0.25 million.

In 2019, we entered into currency-forward transactions and currency-put options (NIS/dollar) of approximately $108 million with settlement dates through 2019-2020, designed to reduce cash-flow exposure to the impact of exchange-rate fluctuations on firm commitments of approximately $108 million. In accordance with ASC 815-10, we recorded in 2018 an increase of approximately $0.2 million in fair market value in "Other Comprehensive Income". Short-term exposures to changing foreign exchange rates are primarily due to operating cash flows denominated in foreign currencies and transactions denominated in non-functional currencies. Our most significant foreign currency exposures are related to our operations in Israel. We have used foreign exchange forward contracts to partially cover known and anticipated exposures. We estimate that an instantaneous 10% depreciation in NIS from its level against the dollar as of December 31, 2019, with all other variables held constant, would increase the fair value of our net assets denominated in foreign currency, held at December 31, 2019, by approximately $0.85 million.

Item 12. Description of Securities Other than Equity Securities

Not applicable.

PART II

Item 13. Defaults, Dividend Arrearages and Delinquencies

None.

Item 14. Material Modification to the Rights of Security Holders and Use of Proceeds

Not applicable.

Item 15. Controls and Procedures

(a) Our management, including our chief executive officer and chief financial officer, has evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2019. The term "disclosure controls and procedures", as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures that are designed to ensure that information required to be disclosed by us in the reports that we file or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the rules and forms of the SEC. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is accumulated and communicated to the our management, including our chief executive officer and chief financial officer, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure. Based on the foregoing, our chief executive officer and chief financial officer have concluded that, as of December 31, 2019, our disclosure controls and procedures were effective.

(b) Our management, under the supervision of our chief executive officer and chief financial officer, is responsible for establishing and maintaining adequate internal control over our financial reporting. The Company's internal control over financial reporting, as defined in Rules 13a-15(f) and 15d-15(f) of the Exchange Act, means a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. Internal control over financial reporting includes policies and procedures that:

— pertain to the maintenance of records that in reasonable detail accurately and fairly reflect our transactions and asset dispositions;

— provide reasonable assurance that transactions are recorded as necessary to permit the preparation of our financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and

— provide reasonable assurance regarding the prevention or timely detection of unauthorized acquisition, use or disposition of assets that could have a material effect on our financial statements.

Due to its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. In addition, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Our management evaluated the effectiveness of our internal control over financial reporting as of December 31, 2019, based on the criteria established in Internal Control—Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this evaluation, our management concluded that, as of December 31, 2019, the Company's internal control over financial reporting was effective.

(c) Kost Forer Gabbay & Kasierer, an independent registered accounting firm and a member firm of Ernst & Young, has issued an attestation report on the effectiveness of our internal control over financial reporting, as stated in their report included herein. See “Report of Independent Registered Public Accounting Firm” on page F-3.

(d) There were no changes in our internal controls over financial reporting identified with the evaluation thereof that occurred during the period covered by this annual report that have materially affected, or are reasonable likely to materially affect our internal control over financial reporting.

Item 16A. Audit Committee Financial Expert

Our board of directors has determined that our audit committee includes one audit committee financial expert, as defined by Item 16A of Form 20-F. Our board of directors has determined that Ms. Dafna Gruber is an “audit committee financial expert” as defined by the SEC rules as well as an independent director as such term is defined by Rule 5605(a)(2) of the Nasdaq Stock Market and has the requisite financial experience as defined by the Nasdaq rules.

Item 16B. Code of Ethics

The Company has adopted a written code of conduct that applies to all Company employees, including the Company’s directors, principal executive officer, principal financial officer and principal accounting officer.

You may review our code of conduct on our website: http://www.novami.com, under “Investors/Corporate Governance”.

Item 16C. Principal Accountant Fees and Services

During the last three fiscal years, Kost Forer Gabbay & Kasierer, an independent registered accounting firm and a member firm of Ernst & Young (“Kost Forer Gabbay & Kasierer”) has acted as our registered public accounting firm and independent auditors. The following table provides information regarding fees paid by us to Kost Forer Gabbay & Kasierer for all services, including audit services, for the years ended December 31, 2018 and 2019:

	2018	2019
Audit Fees	$ 310,000	$ 350,000
Tax Fees	$ 58,000	$ 70,000
Other Fees	$ 4,000	$ 84,000
Total	$ 372,000	$ 504,000

“Audit fees” are fees associated with the annual audit and reviews of the Company’s quarterly consolidated financial results submitted on Form 6-K, consultations on various accounting issues and performance of local statutory audits. The audit fee includes fees associated with the audit of management assessment of internal control over financial reporting, annual tax returns and audit of reports to IIA.

“Tax Fees”. The tax fees to Kost Forer Gabbay & Kasierer during the year ended December 31, 2018 and 2019 are related to ad hoc tax consulting services

“Other Fees” include services related to SEC regulation consulting, IIA application support and Europe funding reporting requirements.

Our audit committee has adopted a pre-approval policy for the engagement of our independent accountant to perform certain services. Pursuant to this policy, which is designed to assure that such engagements do not impair the independence of our auditors, all audit, audit related and tax services must be specifically approved by the audit committee and certain other non-audit, non-audit related and non-tax services may be approved without consideration of specific case-by-case provided certain terms and procedures are met. The Company’s audit committee approved all of the services provided by Kost Forer Gabbay & Kasierer in fiscal years 2019 and 2018.

Item 16D. Exemptions from the Listing Standards for Audit Committees

The Company has not obtained any exemption from applicable audit committee listing standards.

Item 16E. Purchases of Equity Securities by the Issuer and Affiliates Purchasers

In November 2018, we announced a $25 million repurchase program of our ordinary shares. Through December 31, 2019, we spent an aggregate of $11.96 million to repurchase 476,747 ordinary shares under our share repurchase program. The following table provides information regarding our repurchases of our ordinary shares for each month included in the period covered by this annual report on Form 20-F:

Period	(a) Total Number of Ordinary Shares Purchased	(b) Average Price Paid per Ordinary Share	(c) Total Number of Ordinary Shares Purchased as Part of Publicly Announced Plans or Programs	(d) Approximate Dollar Value of Shares that May Yet Be Purchased Under the Plans or Programs (in millions)
May 2019	185,771	$ 25.81	385,771	$ 15.40
June 2019	90,976	$ 25.98	476,747	$ 13.04

Item 16F. Change In Registrant’s Certifying Accountant

None.

Item 16G. Corporate Governance

There are no significant ways in which the Company’s corporate governance practices differ from those followed by domestic companies listed on the Nasdaq Global Select Market.

Item 16H. Mine Safety Disclosure

Not applicable.

PART III

Item 17. Financial Statements

Not applicable.

Item 18. Financial Statements

See pages F-1 through F-34.

Item 19. Exhibits

See Exhibit Index.

NOVA MEASURING INSTRUMENTS LTD.

CONSOLIDATED FINANCIAL STATEMENTS
AS OF DECEMBER 31, 2019

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CONSOLIDATED FINANCIAL STATEMENTS
AS OF DECEMBER 31, 2019

Contents

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Report of Independent Registered Public Accounting Firm

To the Shareholders and the Board of Directors of Nova Measuring Instruments Ltd.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Nova Measuring Instruments Ltd. (the Company) as of December 31, 2019 and 2018, the related consolidated statements of operations, comprehensive income, shareholders' equity and cash flows for each of the three years in the period ended December 31, 2019, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2019 and 2018, and the result of its operations and its cash flows for each of the three years in the period ended December 31, 2019, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated March 12, 2020 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the account or disclosure to which it relates.

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Valuation of excess and obsolete inventory reserve

Description of the Matter	The Company's inventories totaled $48.0 million as of December 31, 2019. As described in Note 2h to the consolidated financial statements, the Company assesses the value of inventories, including raw materials, work-in-process and finished goods, in each reporting period, and values its inventories at the lower of cost or net realizable value. Reserves for potential excess and obsolete inventory are made based on management's analysis of inventory levels, future sales forecasts, the expected consumption of spare parts, and market conditions. The valuation of inventories requires management to make significant assumptions and judgments about the future salability of the inventory. These assumptions include the assessment by inventory category (finished goods, work-in-process and raw materials) of future usage and market demand for the Company's products. Additionally, management makes qualitative judgments related to slow moving and obsolete inventories.
How We Addressed the Matter in Our Audit	We obtained an understanding, evaluated the design, and tested the operating effectiveness of internal controls over the Company's excess and obsolete inventory reserve process, including management's assessment of the underlying assumptions. Our substantive audit procedures included, among others, evaluating the significant assumptions stated above and the accuracy and completeness of the underlying data management used to value excess and obsolete inventory. We compared the cost of on-hand inventories to historical sales and evaluated adjustments to sales forecasts for specific product considerations, such as technological changes or alternative uses. We also assessed the historical accuracy of management's estimates and performed sensitivity analyses over the significant assumptions to evaluate the changes in the obsolete and excess inventory estimates that would result from changes in the underlying assumptions.

/s/ KOST FORER GABBAY & KASIERER
KOST FORER GABBAY & KASIERER
A Member of Ernst & Young Global

We have served as the Company's auditor since 2015.

Tel-Aviv, Israel
March 12, 2020

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

TO THE SHAREHOLDERS AND BOARD OF DIRECTORS OF NOVA MEASURING INSTRUMENTS LTD.

Opinion on Internal Control over Financial Reporting

We have audited Nova Measuring Instruments Ltd. (the "Company") internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control - Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2019, and 2018, the related consolidated statements of operations, comprehensive income, changes in shareholders' equity and cash flows for each of the three years in the period ended December 31, 2019, of the Company and our report dated March 12, 2020, expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management’s Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company’s internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company’s assets that could have a material effect on the financial statements.

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Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ *KOST FORER GABBAY & KASIERER*
KOST FORER GABBAY & KASIERER
A Member of Ernst & Young Global

Tel-Aviv, Israel
March 12, 2020

NOVA MEASURING INSTRUMENTS LTD.
CONSOLIDATED BALANCE SHEETS
(U.S. dollars in thousands, except share data)

	As of December 31,	
	2019	**2018**
ASSETS		
Current assets		
Cash and cash equivalents	$ 31,748	$ 22,877
Short-term interest-bearing bank deposits	154,533	152,951
Trade accounts receivable, net of allowance for doubtful accounts of $135 and $94 at December 31, 2019 and 2018, respectively	51,603	53,531
Inventories (Note 3)	48,362	41,786
Other current assets (Note 4)	16,685	10,432
Total current assets	302,931	281,577
Non-Current assets		
Interest-bearing bank deposits	2,813	-
Restricted interest-bearing bank deposits	2,000	2,000
Deferred tax assets (Note 11)	4,554	3,873
Other long-term assets	437	529
Severance pay funds (Note 8)	1,210	1,394
Right of-use assets (Note 15)	28,256	-
Property and equipment, net (Note 5)	30,566	13,756
Intangible assets, net (Note 6)	7,562	10,187
Goodwill (Note 6)	20,114	20,114
Total non-current assets	97,512	51,853
TOTAL ASSETS	$ 400,443	$ 333,430
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities		
Trade accounts payable	$ 20,706	$ 19,015
Deferred revenues	2,256	3,984
Operating lease current liabilities (Note 15)	2,236	-
Other current liabilities (Note 7)	21,751	25,079
Total current liabilities	46,949	48,078
Non-Current liabilities		
Accrued severance pay (Note 8)	2,120	2,254
Operating lease long-term liabilities (Note 15)	31,077	-
Other long-term liability	5,758	2,358
Total non-current liabilities	38,955	4,612
Commitments and contingencies (Note 9)		
TOTAL LIABILITIES	85,904	52,690
SHAREHOLDERS' EQUITY (Note 10)		
Ordinary shares, NIS 0.01 par value - Authorized 40,000,000 shares at December 31, 2019 and 2018; Issued and Outstanding 28,005,617, and 27,917,505 at December 31, 2019 and 2018, respectively	74	74
Additional paid-in capital	120,737	122,312
Accumulated other comprehensive income (loss)	15	(188)
Retained earnings	193,713	158,542
Total shareholders' equity	314,539	280,740
Total liabilities and shareholders' equity	$ 400,443	$ 333,430

The accompanying notes are an integral part of the consolidated financial statements.

NOVA MEASURING INSTRUMENTS LTD.
CONSOLIDATED STATEMENTS OF OPERATIONS
(U.S. dollars in thousands, except share and per share data)

	Year ended December 31, 2019	2018	2017
Revenues:			
Products	$ 167,200	$ 193,298	$ 174,343
Services	57,709	57,836	47,649
Total revenues	224,909	251,134	221,992
Cost of revenues:			
Products	67,300	71,706	62,242
Services	35,789	34,194	28,563
Total cost of revenues	103,089	105,900	90,805
Gross profit	121,820	145,234	131,187
Operating expenses:			
Research and development, net (Note 2m)	44,508	45,451	38,956
Sales and marketing	29,080	28,847	24,554
General and administrative	10,066	8,735	8,100
Amortization of intangible assets (Note 6)	1,758	1,759	1,758
Total operating expenses	85,412	84,792	73,368
Operating income	36,408	60,442	57,819
Financing income, net (Note 16)	3,078	2,984	2,276
Income before taxes on income	39,486	63,426	60,095
Income tax expenses	4,315	9,051	13,636
Net income	35,171	$ 54,375	$ 46,459
Earnings per share:			
Basic	$ 1.26	$ 1.94	$ 1.68
Diluted	$ 1.23	$ 1.89	$ 1.63
Shares used in calculation of earnings per share:			
Basic	27,895,096	28,022,486	27,695,723
Diluted	28,574,202	28,765,329	28,524,259

The accompanying notes are an integral part of the consolidated financial statements.

NOVA MEASURING INSTRUMENTS LTD.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(U.S. dollars in thousands)

	Year ended December 31,		
	2019	**2018**	**2017**
Net income	$ 35,171	$ 54,375	$ 46,459
Other comprehensive income (loss) ("OCI") (Note 14) related to:			
Unrealized gain (loss) from cash flow hedges	236	(489)	863
Less: reclassification adjustment for net gain (loss) included in net income	(33)	189	(701)
Other comprehensive income (loss)	203	(300)	162
Total comprehensive income	$ 35,374	$ 54,075	$ 46,621

The accompanying notes are an integral part of the consolidated financial statements.

NOVA MEASURING INSTRUMENTS LTD.
CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY
(U.S. dollars in thousands, except share amounts)

	Ordinary Shares		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Retained Earnings	Total Shareholders' Equity
	Number	Amount				
Balance as of January 1, 2017	27,351,431	$ 74	$ 117,028	$ (50)	$ 57,665	$ 174,717
Issuance of shares upon exercise of options	457,810	(*)	2,619	-	-	2,619
Issuance of shares upon vesting of RSU	89,063	(*)	(*)	-	-	-
Share based compensation	-	-	2,779	-	-	2,779
Other comprehensive income	-	-	-	162	-	162
Net income	-	-	-	-	46,459	46,459
Balance as of December 31, 2017	27,898,304	74	122,426	112	104,124	226,736
Cumulative effect from adoption of a new accounting standard – ASC 606 (Note 2l)	-	-	-	-	43	43
Issuance of shares upon exercise of options	99,285	(*)	361	-	-	361
Issuance of shares upon vesting of RSU	119,916	(*)	(*)	-	-	-
Share based compensation	-	-	4,326	-	-	4,326
Share repurchase at cost	(200,000)	(*)	(4,801)	-	-	(4,801)
Other comprehensive income	-	-	-	(300)	-	(300)
Net income	-	-	-	-	54,375	54,375
Balance as of December 31, 2018	27,917,505	74	$ 122,312	$ (188)	158,542	$ 280,740
Issuance of shares upon exercise of options	246,373	(*)	492	-	-	492
Issuance of shares upon vesting of RSU	118,486	(*)	(*)	-	-	-
Share based compensation	-	-	5,092	-	-	5,092
Share repurchase at cost	(276,747)	(*)	(7,159)	-	-	(7,159)
Other comprehensive income	-	-	-	203	-	203
Net income for the year	-	-	-	-	35,171	35,171
Balance as of December 31, 2019	28,005,617	74	120,737	15	193,713	314,539

(*) Less than $1

The accompanying notes are an integral part of the consolidated financial statements.

NOVA MEASURING INSTRUMENTS LTD.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(U.S. dollars in thousands)

	Year ended December 31,		
	2019	**2018**	**2017**
Cash flows from operating activities:			
Net income	$ 35,171	$ 54,375	$ 46,459
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation	5,401	5,071	3,618
Amortization of intangible assets	2,625	2,613	2,561
Amortization of right-of-use assets	2,372	-	-
Share-based compensation	5,092	4,326	2,779
Change in deferred tax assets, net	(681)	(1,916)	(31)
Increase (decrease) in accrued severance pay, net	50	(227)	94
Decrease (increase) in trade accounts receivables, net	1,928	(12,539)	1,677
Increase in inventories	(7,518)	(8,123)	(6,858)
Increase in other current and long-term assets	(6,161)	(3,648)	(2,245)
Increase (decrease) in trade accounts payables	1,691	3,261	(747)
Increase (decrease) in other current and long-term liabilities	2,960	(734)	8,242
Increase (decrease) in short term deferred revenues	(1,728)	(6,350)	6,262
Net cash provided by operating activities	41,202	36,109	61,811
Cash flows from investment activities:			
Increase in short-term and long-term interest-bearing bank deposits	(4,395)	(32,811)	(50,844)
Purchase of property and equipment	(21,269)	(3,678)	(6,295)
Net cash used in investing activities	(25,664)	(36,489)	(57,139)
Cash flows from financing activities:			
Purchases of treasury shares	(7,159)	(4,801)	-
Shares issued upon exercise of options	492	361	2,619
Net cash provided by (used in) financing activities	(6,667)	(4,440)	2,619
Increase (decrease) in cash and cash equivalents and restricted cash	8,871	(4,820)	7,291
Cash and cash equivalents - beginning of year	22,877	27,697	20,406
Cash and cash equivalents - end of year	$ 31,748	$ 22,877	$ 27,697
Supplemental disclosure of cash flow information:			
Cash paid during the year for income taxes	$ 8,342	$ 13,048	$ 8,158

The accompanying notes are an integral part of the consolidated financial statements.

NOTE 1 - GENERAL

Business Description:

Nova Measuring Instruments Ltd. ("Nova" or the "Parent Company") was incorporated and commenced operations in 1993 in the design, development and production of process control systems, used in the manufacturing of semiconductors. Nova has wholly owned subsidiaries in the United States of America (the "U.S."), Japan, Taiwan, Korea and Germany (together defined as the "Company").

The Company continues research and development for the next generation of its products and additional applications for such products. The Company operates in one operating segment.

On April 2, 2015, the Company completed the acquisition of 100% shares of ReVera Inc. (hereinafter – ReVera) a privately-held U.S. company. On December 31, 2017, ReVera, merged into Nova Measuring Instruments, Inc.

The ordinary shares of the Company are traded on the NASDAQ Global Market since April 2000 and on the Tel-Aviv Stock Exchange since June 2002.

NOTE 2 - SIGNIFICANT ACCOUNTING POLICIES

The Company's consolidated financial statements have been prepared in accordance with generally accepted accounting principles ("GAAP") in the United States of America.

The following is a summary of the significant accounting policies, which were applied in the preparation of these financial statements, on a consistent basis:

A. Principles of Consolidation and Basis of Presentation

The Company's consolidated financial statements include the financial statements of the Parent Company and its wholly owned subsidiaries. All intercompany balances and transactions have been eliminated.

B. Use of Estimates in the Preparation of Financial Statements

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 as of the date of the financial statements, and the reported amounts of revenues and expenses during the reporting periods. The Company's management evaluates its estimates on an ongoing basis, including those related to, but not limited to income taxes and tax uncertainties, collectability of accounts receivable, inventory accruals, fair value and useful lives of intangible assets, lease discount rate, lease period and revenue recognition. These estimates are based on management's knowledge about current events and expectations about actions the Company may undertake in the future. Actual results could differ from those estimates.

C. Financial Statements in U.S. Dollars

The currency of the primary economic environment in which the operations of the Company and its subsidiaries are conducted is the U.S. dollar (the "dollar"). Accordingly, the Company uses the dollar as its functional and reporting currency. Certain of the dollar amounts in the financial statements may represent the dollar equivalent of other currencies, including the New Israeli Shekel ("NIS"). Transactions and balances denominated in dollars are presented at their dollar amounts. Non-dollar transactions and balances are re-measured into dollars in accordance with the principles set forth in ASC 830, "Foreign Currency Translation".

All transaction gains and losses of the re-measured monetary balance sheet items are reflected in the statements of operations as financial income or expenses, as appropriate.

NOTE 2 - SIGNIFICANT ACCOUNTING POLICIES (Cont.)

D. Cash and Cash Equivalents, and restricted cash

Cash and cash equivalents represent short-term highly liquid investments (mainly interest-bearing deposits) with maturity dates not exceeding three months from the date of deposit.

Certain restricted cash balances are presented within long-term interest-bearing bank deposits on the consolidated balance sheets based upon the term of the remaining restrictions. The restricted cash balance is related to lease obligations.

E. Short Term Bank Deposit

Short-term bank deposits consist of bank deposits with original maturities of more than three months and up to twelve months.

F. Allowance for Doubtful Accounts

Trade accounts receivables are stated at realizable value, net of an allowance for doubtful accounts. The Company evaluates its outstanding accounts receivable and establishes an allowance for doubtful accounts according to specific identification basis, based on information available on the relevant customer credit condition, current aging, historical experience and based on Company policy. These allowances are re-evaluated and adjusted periodically as additional information is available.

G. Business Combination

The Company accounts for business combination in accordance with ASC No, 805, "Business Combination" (ASC 805). ASC 805 requires recognition of assets acquired and liabilities assumed at the acquisition date, measured at their fair values as of that date. Any access of the fair value of net assets acquired over purchased price and any subsequent changes in estimated contingencies are to be recorded in the consolidated statements of operations.

H. Inventories

Inventories are stated at the lower of cost or net realizable value. Inventory write-downs are provided to cover risks arising from slow-moving items, technological obsolescence, excess inventories, discontinued products, and for market prices lower than cost, if any. The Company periodically evaluates the quantities on hand relative to historical and projected sales volume (which is determined based on an assumption of future demand and market conditions) and the age of the inventory. At the point of the loss recognition, a new lower cost basis for that inventory is established. Any adjustments to reduce the cost of inventories to their net realizable value are recognized in earnings in the current period.

Inventory includes costs of products delivered to customers and not recognized as cost of sales, where revenues in the related arrangements were not recognized.

Cost is determined as follows:

- Raw materials – based on the moving average cost method.
- Finished goods and work in process – based on actual production cost basis (materials, labor and indirect manufacturing costs).

NOTE 2 - SIGNIFICANT ACCOUNTING POLICIES (Cont.)

I. Property and Equipment

Property and equipment are presented at cost, net of accumulated depreciation. Annual depreciation is calculated based on the straight-line method over the estimated useful lives of the related assets. Estimated useful life is as follows:

	Years
Electronic equipment	3 -7
Office furniture and equipment	7 -17
Leasehold improvements	Over the shorter of the term of the lease (including its extension periods) or the useful life of the asset

Depreciation methods, useful lives and residual values are reviewed at the end each reporting year and adjusted if appropriate.

J. Goodwill and Intangible Assets

Goodwill and other purchased intangible assets have been recorded as a result of the acquisition of ReVera. Goodwill represents the excess of the purchase price in a business combination over the fair value of net tangible and intangible assets acquired, and related liabilities.

Goodwill is not amortized, but rather is subject to an impairment test, in accordance with ASC 350, “Intangibles – Goodwill and Other”, at least annually (in the fourth quarter), or more frequently if events or changes in circumstances indicate that the carrying value may be impaired. The Company has an option to perform a qualitative assessment to determine whether it is more-likely-than-not that the fair value of a reporting unit is less than its carrying value prior to performing the quantitative goodwill impairment test. The Company operates in one operating segment, and this segment comprises its only reporting unit.

Following the adoption of ASU 2017-04, "Simplifying the Test for Goodwill Impairment", any excess of the carrying value of the reporting unit over its fair value is recognized as an impairment loss, and the carrying value of goodwill is written down to the fair value of the reporting unit.

Intangible assets with finite life (refer to note 2T for impairment assessment of Intangible assets with finite life) are amortized over their useful lives using a method that reflects the pattern in which the economic benefits of the intangible assets are consumed or otherwise used, or, if that pattern cannot be reliably determined, using a straight-line amortization method.

	Weighted Average Useful Life (Years)
Technology	7
Customer relationships	10
IPR&D	(*)

(*) To be determined upon successful launch of the related product, subject to annual impairment assessment.

IPR&D is tested for impairment annually or more frequently when indicators of impairment exist. The Company first assesses qualitative factors to determine if it is more likely than not that the IPR&D is impaired and whether it is necessary to perform a quantitative impairment test. The qualitative assessment considers various factors, including changes in demand, the abandonment of the IPR&D or significant economic slowdowns in the semiconductor industry and macroeconomic environment. If adverse qualitative trends are identified that could negatively impact the fair value of the asset, then quantitative impairment test is performed to compare the carrying value of the asset to its undiscounted expected future cash flows.

NOTE 2 - SIGNIFICANT ACCOUNTING POLICIES (Cont.)

If this test indicates that there is impairment, the impaired asset is written down to fair value, which is typically calculated using discounted expected future cash flows utilizing an appropriate discount rate.

No impairment losses have been identified during 2017, 2018 and 2019 relating to goodwill and IPR&D.

K. Accrued Warranty Costs

Accrued warranty costs are calculated with respect to the warranty period on the Company’s products and are based on the Company’s prior experience and in accordance with management’s estimate. The estimated future warranty obligations are affected by the warranty periods, install base, labor and other related costs incurred in correcting a product failure.

L. Revenue Recognition

Adoption of ASC 606

Effective January 1, 2018, the Company adopted ASU No. 2014-9, “Revenue from Contracts with Customers” and the related amendments (“ASC 606”) which supersedes ASC 605, "Revenue Recognition", using the modified retrospective method. ASC 606 was applied to all uncompleted contracts as of January 1, 2018, by recognizing the cumulative effect of initially applying ASC 606 as an adjustment to the opening balance of retained earnings at January 1, 2018 and a reduction of $43 in the deferred revenues balance. As part of its assessment process, the Company identified a change in the timing of revenue recognition associated with certain transactions in which recognition was previously subject to final acceptance from the customer. Following the adoption of ASC 606, the associated revenues are recognized upon delivery.

The Company applied the practical expedient for incremental costs of obtaining contracts, in which the associated asset would have been amortized over up to one year.

Results for reporting periods beginning after January 1, 2018 are presented under ASC 606, while prior period have not been adjusted and continue to be reported in accordance with ASC 605 guidance. As of December 31, 2018, the balance sheet changes attributable to ASC 606 related to accounts receivable and deferred revenue were not materially different than the impact upon adoption. In addition, the application of ASC 606 did not have a material impact to either the Company's revenues, cost of sales or its operating expenses during 2018.

Revenue Recognition Policy

The Company enters into revenue arrangements that include products and services which are generally distinct and accounted for as separate performance obligations. The Company determines whether arrangements are distinct based on whether the customer can benefit from the product or service on its own or together with other resources that are readily available and whether the Company's commitment to transfer the product or service to the customer is separately identifiable from other obligations in the contract.

The company derives revenue from sales of advanced process control systems, spare parts, labor hours (mainly related to installation) and service contracts.

Revenues derived from sales of advanced process control systems, spare parts and labor hours are recognized at a point in time, when control of the promised goods or services is transferred to the customers, upon fulfillment of the contractual terms (typically upon shipment of the systems and spare parts or when the service is completed for labor hours).

NOTE 2 - SIGNIFICANT ACCOUNTING POLICIES (Cont.)

Revenues derived from service contracts, are recognized ratably over time in accordance with the term of the contract since the Company has a stand-ready obligation to provide the service. Such contracts generally include a fixed fee.

Revenues from sales which were not yet determined to be final sales due to certain acceptance provisions are deferred.

Significant Judgments - Contracts with Multiple Performance Obligations

Contracts with customers may include multiple performance obligations. For such arrangements, the Company allocates revenue to each performance obligation based on its relative Standalone Selling Price ("SSP"). Judgment is required to determine the SSP for each distinct performance obligation. The Company uses a range of amounts to estimate SSP when it sells each of the products and services separately and needs to determine whether there is a discount to be allocated based on the relative SSP of the various products and services.

Remaining Performance Obligations

Remaining performance obligations (RPOs) represent contracted revenues that had not yet been recognized and include deferred revenues and invoices that have been issued to customers but were uncollected and have not been recognized as revenues. As of December 31, 2018, the aggregate amount of the RPOs was $7,983 comprised of $3,985 deferred revenues and $3,998 of uncollected amounts that were not recognized yet as revenues. As of December 31, 2019, the aggregate amount of the RPOs was $5,362 comprised of $2,256 deferred revenues and $3,106 of uncollected amounts that were not recognized yet as revenues. The Company expects the RPO to be recognized as revenues over the next year.

Contract Balances

Contract balances are presented separately on the consolidated balance sheets.

Revenues recognized during 2019 and 2018 from amounts included within the deferred revenues balance at the beginning of the period amounted to $3,985 and 21,639 respectively.

The Company's general payment terms are less than 1 year; therefore, the Company does not record any financing components.

For more disaggregated information of revenues refer to Note 12.

M. Research and Development

Research and development costs are charged to operations as incurred. Amounts received or receivable from the Government of Israel through the Israeli Innovation Authority ("IIA", formerly known as the Office of the Chief Scientist) or from the European Community as participation in certain research and development programs are offset against research and development costs. The accrual for grants receivable is determined based on the terms of the programs, provided that the criteria for entitlement are expected to be met. Royalty expenses are determined based on actual revenues and presented in cost of revenues. During 2016 the Company entered into a royalty buyout agreement with the Israel Innovation Authority ("IIA"). Refer to note 8A for further details. Research and development grants recognized during the years ended December 31, 2019, 2018 and 2017 were $6,932, $5,763 and $4,634 respectively.

N. Income Taxes

The Company accounts for income taxes utilizing the asset and liability method in accordance with ASC 740, "Income Taxes". Current tax liabilities are recognized for the estimated taxes payable on tax returns for the current year. Deferred tax liabilities or assets are recognized for the estimated future tax effects attributable to temporary differences between the income tax bases of assets and liabilities and their reported amounts in the financial statements, and for tax loss carryforwards.

(U.S. dollars in thousands, except share and per share data)

NOTE 2 - SIGNIFICANT ACCOUNTING POLICIES (Cont.)

Measurement of current and deferred tax liabilities and assets is based on provisions of enacted tax laws, and deferred tax assets are reduced, if necessary, by the amount of tax benefits, the realization of which is not considered more likely than not based on available evidence.

ASC 740-10 requires a two-step approach to recognizing and measuring uncertain tax positions. The first step is to evaluate the tax position for recognition by determining if the weight of available evidence indicates that it is more likely than not that the position will be sustained on audit, including resolution of related appeals or litigation processes, if any. The second step is to measure the tax benefit as the largest amount which is more than 50% likely of being realized upon ultimate settlement.

ASU No. 2015-17, Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes, requires a reporting entity to classify all deferred tax assets and liabilities as noncurrent in a classified balance sheet.

O. Share-Based Compensation

The Company accounts for equity-based compensation using ASC 718 “Compensation - Stock Compensation,” which requires companies to recognize the cost of employee services received in exchange for awards of equity instruments based upon the grant-date fair value of those awards.

Share Options

Under ASC 718, the fair market value of each option grant is estimated on the date of grant using the “Black-Scholes option pricing” method with the following weighted-average assumptions:

	2019	2018	2017
Risk-free interest rate	1.87%	2.79%	1.81%
Expected life of options	4.69 years	4.76 years	4.70 years
Expected volatility	33.18%	31.82%	28.01%
Expected dividend yield	0%	0%	0%

Expected volatility was calculated based on actual historical share price movements over a term that is equivalent to the expected term of granted options. The expected term of options granted is based on historical experience and represents the period of time that options granted are expected to be outstanding. The risk-free interest rate is based on the yield from U.S. treasury bonds with an equivalent term. The Company has historically not paid dividends and has no foreseeable plans to pay dividends.

The Company elected to early adopt ASU-2016-19 starting January 1, 2016 and to account for forfeitures as they occur.

P. Earnings per Share

Earnings per share are presented in accordance with ASC 260-10, “Earnings per Share”. Pursuant to which, basic earnings per share excludes the dilutive effects of convertible securities and is computed by dividing income (loss) available to common shareholders by the weighted-average number of ordinary shares outstanding for the period, net of treasury shares. Diluted earnings per share reflect the potential dilutive effect of all convertible securities. The number of potentially dilutive securities excluded from diluted earnings per share due to the anti-dilutive effect of out of the money options amounted to 438,999 in 2019, 446,301 in 2018 and 275,594 in 2017.

Basic earnings per share in 2019, 2018 and 2017 were $1.26, $1.94 and $1.68 respectively. Diluted earnings per share in 2019, 2018 and 2017 were $1.23, $1.89 and $1.63 respectively.

NOTE 2 - SIGNIFICANT ACCOUNTING POLICIES (Cont.)

Q. Concentrations of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk consist principally of cash and cash equivalents, bank deposits, trade accounts receivable and foreign currency derivative contracts.

The majority of the Company's cash and cash equivalents and bank deposits are invested in dollar instruments with major banks in Israel. Management believes that the financial institutions that hold the Company's investments are corporations with high credit standing. Accordingly, management believes that low credit risk exists with respect to these financial investments.

The trade accounts receivable of the Company are derived from sales to customers located primarily in Taiwan R.O.C., Korea, China and USA. The management of the Company performed risk assessment on an ongoing basis and believes it bears low risk.

The Company entered into options and forward contracts to hedge against the risk of overall changes in future cash flow from payments of payroll and related expenses as well as other expenses denominated in NIS. The derivative instruments hedge a portion of the Company's non-dollar currency exposure. Counterparty to the Company's derivative instruments is major financial institution.

R. Fair Value Measurements

The fair values of the Company cash and cash equivalents, trade accounts receivable, and accounts payable approximate their carrying amounts due to their short-term nature.

The Company follows the provisions of ASC No. 820, "Fair Value Measurement" ("ASC 820"), which defines fair value as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

In determining a fair value, the Company uses various valuation approaches. ASC 820 establishes a hierarchy for inputs used in measuring fair value that maximizes the use of observable inputs and minimizes the use of unobservable inputs by requiring that the most observable inputs be used when available. Observable inputs are inputs that market participants would use in pricing an asset or liability, based on market data obtained from sources independent of the Company. Unobservable inputs are inputs that reflect assumptions that market participants would use in pricing an asset or liability, based on the best information available under given circumstances.

The hierarchy is broken down into three levels, based on the observability of inputs and assumptions, as follows:

Level 1 - Observable inputs obtained from independent sources, such as quoted prices for identical assets and liabilities in active markets.

Level 2 - Other inputs that are directly or indirectly observable in the market place.

Level 3 - Unobservable inputs which are supported by little or no market activity.

The estimated fair values of the derivative instruments are determined based on market rates to settle the instruments. The fair value of the Company's derivative contracts (including forwards and options) is determined using standard valuation models. The significant inputs used in these models are readily available in public markets or can be derived from observable market transactions and, therefore, the Company's derivative contracts have been classified as Level 2.

Inputs used in these standard valuation models include the applicable spot, forward, and discount rates. The standard valuation model for the Company options contracts also includes implied volatility, which is specific to individual options and is based on rates quoted from a widely used third-party resource.

NOTE 2 - SIGNIFICANT ACCOUNTING POLICIES (Cont.)

S. Derivative Financial Instruments

ASC 815 requires the presentation of all derivatives as either assets or liabilities on the balance sheet and the measurement of those instruments at fair value.

For derivative instruments that are designated and qualify as a cash flow hedge (i.e., hedging the exposure to variability in expected future cash flows that is attributable to a particular risk), the effective portion of the gain or loss on the derivative instrument is reported as a component of other comprehensive income and reclassified into earnings in the same period or periods during which the hedged transaction affects earnings. The remaining gain or loss on the derivative instrument in excess of the cumulative change in the present value of future cash flows of the hedged item, if any, is recognized in current earnings (as part of the financing income, net, in the consolidated statement of operations) during the period of change. See Note 13 for disclosure of the derivative financial instruments in accordance with such pronouncements.

T. Impairment of Long-Lived Assets

Long-lived assets (tangible and intangible assets with finite life), held and used by the Company are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of the assets (or asset Group) may not be recoverable. In the event that the sum of the expected future cash flows (undiscounted and without interest charges) of the long-lived assets is less than the carrying amount of such assets, an impairment charge would be recognized, and the assets (or asset Group) would be written down to their estimated fair values.

The Company performed an impairment review and did not identify any indicators for impairment as of each of 2019, 2018 and 2017.

U. Leases

Under ASC 842, a contract is or contains a lease when the Company has the right to control the use of an identified asset for a period of time. The Company determines if an arrangement is a lease at inception of the contract, which is the date on which the terms of the contract are agreed to, and the agreement creates enforceable rights and obligations. The commencement date of the lease is the date that the lessor makes an underlying asset available for the Company’s use. On the commencement date leases are evaluated for classification and assets and liabilities are recognized based on the present value of lease payments over the lease term.

The lease term used to calculate the lease liability includes options to extend or terminate the lease when it is reasonably certain that the option will be exercised. The right-of-use (“ROU”) asset is initially measured as the amount of lease liability, adjusted for any initial lease costs, prepaid lease payments and any lease incentives. Costs incurred for common area maintenance, real estate taxes, and insurance are not included in the lease liability and are recognized as they are incurred.

The Company’s leases include office buildings for its facilities and car leases in Israel, which are all classified as operating leases. Certain lease agreements include rental payments that are adjusted periodically for the consumer price index (“CPI”). The ROU and lease liability were calculated using the CPI as of the adoption date and will not be subsequently adjusted. Certain leases include renewal options that are under the Company’s sole discretion. The renewal options were included in the ROU and liability calculation if it was reasonably assured that the Company will exercise the option.

As the Company’s lease arrangements do not provide an implicit rate, the Company uses its incremental estimated borrowing rate at lease commencement to measure ROU assets and lease liabilities. The Company used the incremental borrowing rate on January 1, 2019 for all leases that commenced on or prior to that date. Operating lease expense is generally recognized on a straight-line basis over the lease term. For leases with a term of one year or less, the Company elected not to record the ROU asset or liability.

NOTE 2 - SIGNIFICANT ACCOUNTING POLICIES (Cont.)

V. New Accounting Pronouncements

Recently adopted

In February 2016, the Financial Accounting Standards Board ("FASB") issued ASC 842 which supersedes the lease recognition requirements in ASC 840, Leases, ("ASC 840"). The most prominent of the changes in ASC 842 is the recognition of ROU assets and lease liabilities by lessees for those leases classified as operating leases.

Consistent with ASC 840, leases will be classified as either finance or operating, with classification affecting the pattern of expense recognition in the statements of operations. In July 2018, the FASB issued an accounting standard update which amended ASC 842 and offered an additional (and optional) transition method by which entities could elect not to recast the comparative periods presented in financial statements in the period of adoption.

The Company adopted the new standard on January 1, 2019, the first day of fiscal 2019, using the optional adoption method whereby the Company did not adjust comparative period financial statements. Consequently, prior period balances and disclosures have not been restated. The Company elected certain practical expedients, which among other things, allowed to carry forward prior conclusions about lease identification and classification. The adoption of ASC 842 resulted in the balance sheet recognition of additional lease assets and lease liabilities of approximately $26 million and $28 million as of January 1, 2019, respectively, related primarily to facilities and vehicles. The adoption of ASC 842 did not have a material impact on beginning retained earnings, the Condensed Consolidated Statement of Operations, Cash Flows, or earnings per share. For additional information regarding the Company's leases, see Note 14 "Leases" in the Condensed Consolidated Financial Statements.

Issued and not yet adopted

In June 2016, the FASB issued ASU 2016-13, "Financial Instruments—Credit Losses", which requires that expected credit losses relating to financial assets measured on an amortized cost basis and available for sale debt securities be recorded through an allowance for credit losses. ASU 2016-13 limits the amount of credit losses to be recognized for available for sale debt securities to the amount by which carrying value exceeds fair value and also requires the reversal of previously recognized credit losses if fair value increases. The new standard will be effective for interim and annual periods beginning after January 1, 2020, and early adoption is permitted. The Company is currently evaluating the potential impact of adoption of the ASU on its consolidated financial statements.

In August 2018, the FASB issued ASU 2018-13 "Fair Value Measurement", which modifies the existing accounting standards for fair value measurement disclosure. This update eliminates the disclosure of the amount of and reasons for transfers between level 1 and level 2 of the fair value hierarchy, and the policy for timing of transfers between levels. This standard update is effective for the Company form the year ending December 31, 2020, and early adoption is permitted. The Company evaluating the impact of this accounting standard update on the Company's Condensed Consolidated Financial Statements.

In August 2018, the FASB issued ASU 2018-14 "Compensation - Retirement Benefits – Defined Benefit Plans – General" , which modifies the disclosure requirements related to defined benefit pension and other post-retirement plans. Some of the changes include adding a disclosure requirement for significant gains and losses related to changes in the benefit obligation for the period and removing the amounts in accumulated other comprehensive income expected to be recognized as components of net periodic benefit cost over the next fiscal year. This standard update is effective for us for the fiscal year starting January 1, 2021, and early adoption is permitted. The Company currently evaluating the impact of this accounting standard update on our Condensed Consolidated Financial Statements.

(U.S. dollars in thousands, except share and per share data)

NOTE 2 - SIGNIFICANT ACCOUNTING POLICIES (Cont.)

In May 2019, the FASB issued ASU 2017-04, "Intangibles-Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment" which eliminates step two from the goodwill impairment test. Under ASU 2017-04, an entity should recognize an impairment charge for the amount by which the carrying amount of a reporting unit exceeds its fair value up to the amount of goodwill allocated to that reporting unit. This standard update is effective beginning January 1, 2020, with early adoption permitted.

In December 2019, the FASB issued ASU 2019-12 "Income Taxes (Topic 740), Simplifying the Accounting for Income Taxes" an accounting standard update to simplify the accounting for income taxes in ASC 740, Income Taxes, ("ASC 740"). This amendment removes certain exceptions and improves consistent application of accounting principles for certain areas in ASC 740. The update is effective for us beginning in the first quarter of our fiscal year ending December 31, 2020, and early adoption is permitted. The Company currently evaluating the impact of this accounting standard update on our Condensed Consolidated Financial Statements.

W. Certain prior period amounts have been reclassified to conform to the current period presentation.

NOTE 3 - INVENTORIES

A. Composition:

	As of December 31,	
	2019	**2018**
Raw materials	$ 14,428	$ 11,166
Work in process	25,831	18,736
Finished goods	8,103	11,884
	$ 48,362	$ 41,786

B. In the years ended December 31, 2019, 2018 and 2017, the Company wrote down inventories in a total amount of $4,435, $4,635 and $3,418, respectively.

NOTE 4 - OTHER CURRENT ASSETS

	As of December 31,	
	2019	**2018**
Governmental institutions	$ 13,979	$ 6,533
Prepaid expenses	1,834	3,120
Other	872	779
	$ 16,685	$ 10,432

(U.S. dollars in thousands, except share and per share data)

NOTE 5 - PROPERTY AND EQUIPMENT, NET

	As of December 31,	
	2019	2018
Cost:		
Electronic equipment	$ 38,432	$ 33,160
Office furniture and equipment	4,353	1,557
Leasehold improvements	25,330	11,340
	$ 68,115	$ 46,057
Accumulated depreciation:		
Electronic equipment	$ 28,835	$ 25,259
Office furniture and equipment	1,431	1,237
Leasehold improvements	7,283	5,805
	37,549	32,301
Net book value	$ 30,566	$ 13,756

Depreciation expenses amounted to $5,401, $5,071 and $3,618 for the years ended December 31, 2019, 2018 and 2017, respectively.

NOTE 6 - GOODWILL AND INTANGIBLE ASSETS

Goodwill and Intangible assets originated from the acquisition of ReVera on April 2, 2015. The following is a summary of intangible assets as of December 31, 2019 and 2018:

	As of December 31,	
	2019	2018
Original amount:		
Technology	$ 12,305	$ 12,305
Customer relationships	5,191	5,191
Backlog	3,506	3,506
IPR&D	1,927	1,927
	22,929	22,929
Accumulated amortization:		
Technology	8,350	6,592
Customer relationships	3,511	2,644
Backlog	3,506	3,506
IPR&D	-	-
	15,367	12,742
Net book value	$ 7,562	$ 10,187

Amortization expenses amounted to $2,625, $2,613 and $2,561 for the years ended December 31, 2019, 2018 and 2017, respectively.

(U.S. dollars in thousands, except share and per share data)

NOTE 6 - GOODWILL AND INTANGIBLE ASSETS (Cont.)

Annual amortization expenses (excluding IPR&D) are expected as follows:

Year ending December 31,		
2020	$	2,503
2021		2,297
2022		736
2023		84
2024		15
	$	5,635

Goodwill amounted to $20,114 as of December 31, 2019 and 2018.

NOTE 7 - OTHER CURRENT LIABILITIES

A. Consists of:

	As of December 31, 2019		2018	
Accrued salaries and fringe benefits	$	12,080	$	14,281
Accrued warranty costs (See B below)		5,132		5,622
Governmental institutions		4,193		4,417
Other		346		759
	$	21,751	$	25,079

B. Accrued Warranty Costs:

The Company provides standard warranty coverage on its systems. Parts and labor are covered under the terms of the warranty agreement. The Company accounts for the estimated warranty cost as a charge to costs of revenues when revenue is recognized.

The following table provides the changes in the product warranty accrual for the fiscal years ended December 31, 2019 and 2018:

	As of December 31, 2019		2018	
Balance as of beginning of year	$	5,622	$	5,055
Services provided under warranty		(6,759)		(6,428)
Changes in provision		6,269		6,995
Balance as of end of year	$	5,132	$	5,622

NOTE 8 - LIABILITY FOR EMPLOYEE SEVERANCE PAY, NET

Israeli law and labor agreements determine the obligations of the Company to make severance payments to dismissed employees and to employees leaving employment under certain other circumstances. The obligation for severance pay benefits, as determined by Israeli law, is based upon length of service and the employee’s most recent salary. The liability is partially covered through insurance policies purchased by the Company and deposits in a severance fund.

The deposited funds include profits accumulated up to the balance sheet date. The deposited funds may be withdrawn only upon the fulfillment of the obligation pursuant to Israel's Severance Pay Law, 1963 or labor agreements.

Since July 2008, the Company's agreements with new Israeli employees are under Section 14 of the Israeli Severance Pay Law, 1963. The Company's contributions for severance pay have replaced its severance obligation.

Upon contribution of the full amount of the employee's monthly salary for each year of service, no additional calculations are conducted between the parties regarding the matter of severance pay and no additional payments are made by the Company to the employee.

Severance pay expenses (income) for the years ended December 31, 2019, 2018 and 2017, amounted to $16, $(161) and $168, respectively (excluding the Company’s contributions for severance pay under section 14).

NOTE 9 - COMMITMENTS AND CONTINGENCIES

The Company is obligated under certain agreements with its suppliers to purchase specified items of inventory which are expected to be utilized during the years 2020-2022. As of December 31, 2019, non-cancelable purchase obligations were approximately $16,406.

NOTE 10 - SHAREHOLDERS’ EQUITY

A. Rights of Shares:

Holders of ordinary shares are entitled to participate equally in the payment of cash dividends and bonus shares (stock dividends) and, in the event of the liquidation of the Company, in the distribution of assets after satisfaction of liabilities to creditors. Each ordinary share is entitled to one vote on all matters to be voted on by shareholders.

B. Share Repurchase:

On November 1, 2018, the Company announced $25,000 shares repurchase program. Through December 31, 2019, the Company repurchased 476,747 ordinary shares for an aggregate amount of $11,960.

All treasury shares have been canceled as of the end of each respective year.

C. Equity Based Incentive Plans:

The Company’s Board of directors approves, from time to time, equity-based incentive plans, the last of which was approved in August 2017. Equity-based incentive plans include stock options, restricted share units and restricted stock awards to employees, officers and directors.

(U.S. dollars in thousands, except share and per share data)

NOTE 10 - SHAREHOLDERS' EQUITY (Cont.)

Share-based compensation

The following table summarizes the effects of share-based compensation resulting from the application of ASC 718 included in the Statements of Operations as follows:

	Year ended December 31,		
	2019	2018	2017
Cost of Revenues:			
Product	534	515	370
Service	469	414	269
Research and Development	2,206	1,710	1,055
Sales and Marketing	1,121	1,026	621
General and Administration	762	661	464
Total	$ 5,092	$ 4,326	$ 2,779

As of December 31, 2019, there was $1,904 of total unrecognized compensation cost related to non-vested employee options and $7,047 of total unrecognized compensation cost related to non-vested employee RSUs. These costs are generally expected to be recognized over a period of four years.

Shares Options

Share options vest over four years and their term may not exceed 10 years. During the period commencing January 1, 2016 and ending July 31, 2017, the exercise price of each option was the average market price of the underlying share during the period of 30 trade days preceding the date of each grant. Commencing August 1, 2017, the exercise price is the market price at the date of each grant.

The weighted average fair value (in dollars) of the options granted during 2019, 2018 and 2017, according to Black-Scholes option-pricing model, amounted to $8.18, $8.37 and $6.64 per option, respectively.

Summary of the status of the Company's share option plans as of December 31, 2019, as well as changes during the year then ended, is presented below:

	2019	
	Share Options	Weighted Average Exercise Price
Outstanding - beginning of year	1,530,073	17.27
Granted	135,580	26.14
Exercised	(246,373)	10.91
Expired and forfeited	(199,371)	17.09
Outstanding - year end	1,219,909	19.57
Options exercisable at year end	672,695	15.73

The aggregate intrinsic value represents the total intrinsic value (the difference between the Company's closing share market price on the last trading day of the fiscal year and the exercise price, multiplied by the number of in-the-money options) that would have been received by the option holders had all option holders exercised their options on the last trading day of the fiscal year. This amount changes based on the fair market value of the Company's shares.

(U.S. dollars in thousands, except share and per share data)

NOTE 10 - SHAREHOLDERS' EQUITY (Cont.)

The total intrinsic value of options outstanding as of December 31, 2019 and 2018 was $22,279 and $10,665, respectively. The total intrinsic value of options exercisable as of December 31, 2019 and 2018 was $14,867 and $7,679, respectively. The total intrinsic value of options exercised during the years 2019, 2018 and 2017 was $4,570, $2,170 and $5,170 respectively.

The following table summarizes information about share options outstanding as of December 31, 2019:

Range of Exercise Prices (US dollars)	Number Outstanding	Weighted Average Remaining Contractual Life (in years)	Weighted Average Exercise Price (US dollars)	Number Exercisable	Weighted Average Exercise Price (US dollars)
4.20-7.00	10,000	0.48	4.20	10,000	4.20
8.01-9.00	36,298	0.79	8.82	36,298	8.82
9.01-10.00	5,002	0.73	9.11	4,751	9.09
10.01-20.00	490,873	2.61	11.50	417,974	11.50
20.01-34.85	677,736	5.39	26.29	203,672	26.36
	1,219,909		19.57	672,695	15.73

Restricted Share Units

Restricted Share Units ("RSU") grants are rights to receive shares of the Company's common stock on a one-for-one basis and vest 25% on each of the first, second, third and fourth anniversaries of the grant date and are not entitled to dividends or voting rights, if any, until they are vested. The fair value of such RSU grants is being recognized on a straight-line basis over the vesting period. Performance based RSU grants vest over a period of 3 years and are subject to certain performance criteria; accordingly, compensation expense is recognized for such awards when it becomes probable that the related performance condition will be satisfied.

	Number of RSUs	Weighted average grant date fair value (USD)
Unvested at January 1, 2019	323,895	22.40
Granted	210,892	29.60
Vested	(118,486)	19.94
Canceled	(29,083)	24.54
Unvested at December 31, 2019	387,218	26.91

The total intrinsic value of RSUs vested during the years 2019, 2018 and 2017 was $3,513, $1,048 and $989, respectively.

NOTE 11 - INCOME TAXES

A. Income Tax Regulations (Rules on Bookkeeping by Foreign Invested Companies and Certain Partnerships and Determination of their Taxable Income), 1986:

As a "Controlled Foreign Cooperation" (as defined in the Israeli Law for the Encouragement of Capital Investments-1959), the Company's management has elected to apply Income Tax Regulations (Rules for Maintaining Accounting Records of Foreign Invested Companies and Certain Partnerships and Determining Their Taxable Income)-1986. Accordingly, its taxable income or loss is calculated in US Dollars.

B. Law for the Encouragement of Capital Investments-1959:

Part of the Company's investment in equipment has received approvals in accordance with the Law for the Encouragement of Capital Investments, 1959 ("Approved Enterprise" status) in three separate investment plans. The Company has chosen to receive its benefits through the "Alternative Benefits" track, and, as such, is eligible for various benefits. These benefits include accelerated depreciation of fixed assets used in the investment program, as well as a full tax exemption on undistributed income in relation to income derived from the first plan for a period of 4 years and for the second and third plans for a period of 2 years. Thereafter a reduced tax rate of 25% will be applicable for an additional period of up to 3 years for the first plan and 5 years for the second and third plans, commencing with the date on which taxable income is first earned but not later than certain dates. The benefit period of the second and third plan have commenced.

On April 1, 2005, an amendment to the Investment Law came into effect ("the Amendment") and has significantly changed the provisions of the Investment Law. The Amendment limits the scope of enterprises which may be approved by the Investment Center by setting criteria for the approval of a facility as a Privileged Enterprise, such as provisions generally requiring that at least 25% of the Privileged Enterprise's Income will be derived from export. Additionally, the Amendment enacted major changes in the manner in which tax benefits are awarded under the Investment Law so that companies no longer require Investment Center approval in order to qualify for tax benefits.

However, the Investment Law provides that terms and benefits included in any certificate of approval already granted will remain subject to the provisions of the law as they were on the date of such approval. Therefore, the Israeli companies with Approved Enterprise status will generally not be subject to the provisions of the Amendment.

The entitlement to the above benefits is conditional upon the Company fulfilling the conditions stipulated by the above law, regulations published thereunder and the instruments of approval for the specific investments in "Approved Enterprises". In the event of failure to comply with these conditions, the benefits may be canceled, and the Company may be required to refund the amount of the benefits, in whole or in part, including interest.

In the event of distribution by the Company of a cash dividend out of retained earnings that were tax exempt due to its Approved Enterprise status, the Company would have to pay corporate tax of 10% - 25% on the income from which the dividend was distributed based on the extent to which non-Israeli shareholders hold Company's shares. A 15% withholding tax may be deducted from dividends distributed to the recipients.

The Company has not provided deferred taxes on future distributions of tax-exempt earnings, as the Company intends to reinvest any income derived from its Approved Enterprise program and not to distribute such income as a dividend. Accordingly, such earnings (amounting to $61,601 as of December 31, 2019) have been considered to be permanently reinvested. If these earnings will be distributed, they will be taxed at the applicable corporate tax rate of 25%.

In 2008, the Company submitted a request to approve a new plan (fourth plan) as a Privileged Enterprise in accordance with the Amendment to the Investment Law. The commencing year was 2010. The expected expiration year is 2021.

NOTE 11 - INCOME TAXES (Cont.)

In 2011, new legislation amending to the Investment Law was adopted. Under this new legislation, a uniform corporate tax rate will apply to all qualifying income of certain Industrial Companies (Requirement of a minimum export of 25% of the company's total turnover), as opposed to the current law's incentives, which are limited to income from Approved Enterprises during their benefits period. Under the new law, the uniform tax rate will be 10% in areas in Israel designated as Development Zone A and 15% elsewhere in Israel during 2011-2012, 7% and 12.5%, respectively, in 2013-2014, and 6% and 12%, respectively thereafter. The profits of these Industrial Companies will be freely distributable as dividends, subject to a 15% withholding tax (or lower, under an applicable tax treaty).

Under the transition provisions of the new legislation, the Company may decide to irrevocably implement the new law while waiving benefits provided under the current law or to remain subject to the current law.

In August 2013 "The Arrangements Law" (hereinafter—"the Law") was officially published. The following significant changes affecting taxation were approved:

1. The tax rate on a company in Development area A, effective January 1, 2014 is 9% (instead of 7% in 2014 and 6% in 2015 and thereafter), and the tax rate for companies in all other areas will be 16% (instead of 12.5% in 2014 and 12% in 2015 and thereafter).
2. The tax rate on dividend distributed, generated from "preferred income" or by a company that has an approved enterprise increased effective January 1, 2014 from 15% to 20%.

In 2016, most of the Company's taxable income in Israel is attributable to Preferred Enterprises, with a related tax rate of 16%. In 2015 and 2014, most of the Company's taxable income in Israel is attributable to Approved Enterprise programs with zero tax.

C. The New Technological Enterprise Incentives Regime - Amendment 73 to the Investment Law

In December 2016, the Economic Efficiency Law (Legislative Amendments for Applying the Economic Policy for the 2017 and 2018 Budget Years), 2016 which includes Amendment 73 to the Law for the Encouragement of Capital Investments ("the 2017 Amendment") was published. According to the 2017 Amendment, Technological preferred enterprise, as defined in the Law for the Encouragement of Capital Investments, 1959 ("the Encouragement Law"), with total consolidated revenues of less than NIS 10 billion, shall be subject to 12% tax rate on income deriving from intellectual property (in development area A - a tax rate of 7.5%).

Any dividends distributed deriving from income from the preferred technological enterprises will be subject to tax at a rate of 20%. The 2017 Amendment further provides that, in certain circumstances, a dividend distributed to a foreign corporate shareholder, would be subject to a 4% tax rate (if the percentage of foreign investors exceeds 90%).

The Company assessed the criteria for qualifying to a "Preferred Technological Enterprise," status and concluded that the Israeli entity is entitled to the above-mentioned benefits. The Company implemented the new incentives in its tax calculations starting 2017.

D. The Tax Cuts and Jobs Act, 2017:

On December 22, 2017, the U.S. enacted the Tax Cuts and Jobs Act (the "US Tax Act") that instituted fundamental changes to the taxation of multinational corporations. The Tax Act includes significant changes to the U.S. corporate income tax system, including a Federal corporate rate reduction from 35% to 21%, limitations on the deductibility of interest expense and executive compensation, the transition of U.S. international taxation from a worldwide tax system to a territorial tax system, and foreign derived intangible income deduction.

(U.S. dollars in thousands, except share and per share data)

NOTE 11 - INCOME TAXES (Cont.)

Foreign-Derived Intangible Income:

The 2017 Tax Act provides tax incentives to U.S. companies to earn income from the sale, lease or license of goods and services abroad in the form of a deduction for foreign-derived intangible income (“FDII”). FDII is taxed at an effective rate of 13.1% for taxable years beginning after December 31, 2017 and at an effective rate of 16.4% for taxable years beginning after December 31, 2025. The accounting for the deduction for FDII is similar to a special deduction and should be accounted for based on the guidance in ASC 740-10-25-37. The tax benefits for special deductions ordinarily are recognized no earlier than the year in which they are deductible on a tax return.

E. Deferred Taxes:

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of the deferred tax assets are as follows:

	As of December 31,	
	2019	2018
Net operating loss carryforwards	$ 513	$ 1,800
Tax credits carryforward	794	-
Temporary differences relating to reserve and allowances	5,782	4,234
Intangible assets	(1,637)	(2,161)
	5,452	3,873
Valuation Allowance	(898)	-
Deferred tax asset, net	$ 4,554	$ 3,873

Long-term deferred tax assets:

	Year ended December 31,	
	2019	2018
Domestic	$ 3,742	$ 2,998
Foreign	812	875
	$ 4,554	$ 3,873

Under ASC 740-10, deferred tax assets are to be recognized for the anticipated tax benefits associated with net operating loss and tax credits carry-forwards and deductible temporary differences; unless it is more-likely-than-not that some or all of the deferred tax assets will not be realized.

F. Income before taxes on income included in the consolidated statements of operations:

	Year ended December 31,		
	2019	2018	2017
Domestic	$ 25,803	$ 41,013	$ 51,558
Foreign (mainly US)	13,683	22,413	8,537
	$ 39,486	$ 63,426	$ 60,095

(U.S. dollars in thousands, except share and per share data)

NOTE 11 - INCOME TAXES (Cont.)

G. Income tax expenses (tax benefits) included in the consolidated statements of operations:

	Year ended December 31, 2019	2018	2017
Domestic	$ 4,482	$ 5,767	$ 12,043
Foreign (mainly US)	(167)	3,284	1,593
	$ 4,315	$ 9,051	$ 13,636
Current	$ 3,340	$ 10,793	$ 13,584
Deferred	975	(1,742)	52
	$ 4,315	$ 9,051	$ 13,636

H. Tax Reconciliation:

The following is a reconciliation of the theoretical tax expense, assuming that all income is taxed at the ordinary statutory average corporate tax rate in Israel and the actual tax expense in the statement of operations, is as follows:

	Year ended December 31, 2019	2018	2017
Net income before taxes	$ 39,486	$ 63,426	$ 60,095
Statutory tax expenses	5,042	8,100	7,674
Effect of non-benefited income New Technological or Preferred Enterprises statuses in Israel	144	172	181
Permanent differences, including difference between the basis of measurement of income reported for tax purposes and the basis of measurement of income for financial reporting purposes, net	(131)	441	203
Change in tax reserve for uncertain tax positions	850	619	1,248
Different tax rates of deferred taxes	-	-	(226)
Effect of foreign operations taxed at various rates	1,173	2,034	1,888
Foreign Derived Intangible Income benefit	(768)	(1,534)	-
Tax credits	(777)	(664)	(1,650)
Adjustments for previous year's tax	(2,121)	(159)	4,174
Change in valuation allowance	898	-	-
Other	5	42	144
	(727)	951	5,962
Actual tax expenses	$ 4,315	$ 9,051	$ 13,636

I. Effective Tax Rates:

The Company's effective tax rates differ from the statutory rates applicable to the Company for tax year 2019, primarily due to tax benefits related to foreign derived income benefit, valuation allowance changes and adjustments for previous years tax, in the US. The Company's effective tax rates differ from the statutory rates applicable to the Company for tax year 2018, primarily due to foreign derived income benefit in the US.

(U.S. dollars in thousands, except share and per share data)

NOTE 11 - INCOME TAXES (Cont.)

J. Tax Assessments:

In 2017 the Parent Company has received final tax assessments for the years 2012-2015 from the Israeli Tax Authorities. The net effect of the tax assessment in the amount of $3,553 is included in the Company’s statement of operations for the year ended December 31, 2017, as well as $355 of interest related to this assessment.

For the US subsidiary tax years starting 2015 and any tax attributes carryforwards from prior periods remain subject to examination in future periods. The other subsidiaries received final tax assessments through tax years 2012 until 2016.

K. Undistributed earnings of foreign subsidiaries:

The Company considers the earnings of certain subsidiaries to be indefinitely invested outside Israel on the basis of estimates that future domestic cash generation will be sufficient to meet future domestic cash needs and the Company’s specific plans for reinvestment of those subsidiary earnings. The Company has not recorded a deferred tax liability of approximately $11,382 related to the Israel income taxes of undistributed earnings of foreign subsidiaries indefinitely invested outside Israel. Should the Company decide to repatriate the foreign earnings, the Company would need to adjust the Company’s income tax provision in the period The Company determined that the earnings will no longer be indefinitely invested outside Israel.

L. Uncertain Tax Positions:

The taxation of the Company's business is subject to the application of multiple and sometimes conflicting tax laws and regulations as well as multinational tax conventions. The application of tax laws and regulations is subject to legal and factual interpretation, judgment and uncertainty.

In addition, the Company classifies interest and penalties recognized in the financial statements relating to uncertain tax position under the income taxes line item.

Tax laws themselves are subject to change as a result of changes in fiscal policy, changes in legislation and the evolution of regulations and court rulings. Consequently, taxing authorities may impose tax assessments or judgments against the Company that could materially impact its tax liability and/or its effective income tax rate.

The Company believes that it has adequately provided for any reasonably foreseeable outcomes related to tax audits and settlement. The final tax outcome of its tax audits could be different from that which is reflected in the Company’s income tax provisions and accruals. Such differences could have a material effect on the Company’s income tax provision and net income in the period in which such determination is made.

The following table summarizes the changes in uncertain tax positions:

	As of December 31,	
	2019	2018
Balance at the beginning of the year	$ 7,118	$ 6,533
Decrease related to prior year tax positions, net	(519)	(164)
Increase related to unutilized tax credits	-	65
Increase related to current year tax positions	1,139	684
Balance at the end of the year*	$ 7,738	$ 7,118

*The amount for the year ended December 31, 2019 and 2018 includes $2,120 and $4,897 unrecognized tax benefits, respectively, which are presented as a reduction from deferred tax assets, see Note 10e.

The Company recognizes interest and penalties related to unrecognized tax benefits as a component of income tax expenses.

(U.S. dollars in thousands, except share and per share data)

NOTE 11 - INCOME TAXES (Cont.)

M. Income from Other Sources in Israel:

Income not eligible for benefits under the New Technological Enterprise Laws mentioned in ”D” above are taxed at the corporate tax rate of 23% in 2019, 23% in 2018 and 24% in 2017.

NOTE 12 - GEOGRAPHIC AREAS AND MAJOR CUSTOMERS

A. Sales by Geographic Area (as Percentage of Total Sales):

	Year ended December 31,		
	2019	2018	2017
	%	%	%
Taiwan, R.O.C.	37	31	31
USA	25	18	17
China	18	18	16
Korea	9	21	28
Other	11	12	8
Total	100	100	100

Revenues are attributed to countries based on the geographic location of the customer.

B. Sales by Major Customers (as Percentage of Total Sales):

	Year ended December 31,		
	2019	2018	2017
	%	%	%
Customer A	27	20	23
Customer B	16	19	22
Customer C	13	14	14

C. Long-lived assets by geographic location:

	As of December 31,	
	2019	2018
	%	%
Israel	85	92
US	14	5
Other	1	3
Total long-lived assets (*)	100	100

(*) Long-lived assets are comprised of property and equipment, net.

(U.S. dollars in thousands, except share and per share data)

NOTE 13 - FINANCIAL INSTRUMENTS

A. Hedging Activities

The Company enters into forward contracts, and currency options to hedge its balance sheet exposure as well as certain future cash flows in connection with certain operating expenses (mainly payroll expense) and forecast transactions which are expected to be denominated mainly in New Israeli Shekel ("NIS"). The Company is exposed to losses in the event of non-performance by counterparties to financial instruments; however, as the counterparties are major Israeli banks, credit risk is considered immaterial. The Company does not hold or issue derivatives for trading purposes. The notional amounts of the hedging instruments as of December 31, 2019 and December 31, 2018 were $16,174, and $21,093 respectively. The terms of all of these currency derivatives are less than one year.

B. Derivative Instruments

The fair value of derivative contracts as of December 31, 2019 and December 31, 2018 was as follows:

	Derivative Assets Reported in Other Current Assets		Derivative Liabilities Reported in Other Current Liabilities	
	December 31,		December 31,	
	2019	2018	2019	2018
Derivatives designated as hedging instruments in cash flow hedge	$ 68	$ -	$ -	$ 320

The impact of derivative instrument on total operating expenses in the year ended December 31, 2019, 2018 and 2017 was:

	Year ended December 31,		
	2019	2018	2017
Loss (gain) on derivative instruments	$ 33	$ (189)	$ 701

(U.S. dollars in thousands, except share and per share data)

NOTE 14 - LEASES

The Company has operating leases for facilities and vehicles. The Company has operating leases for facilities and vehicles. The Company recognized leased assets of $28,256, and corresponding current liabilities of $2,236, and long-term liabilities of $31,077, as of December 31, 2019. The Company's leases have remaining terms of 1 to 10 years, some of which include options to extend the leases for up to additional 10 years. The weighted average remaining lease term was 16 years (between 1 and 20 years), and the weighted average discount rate was 5.6% (between 2.8% and 6.6%) as of December 31, 2019.

For the twelve months ended December 31, 2019, lease expenses were $5,166. In accordance with the new leases standard, the expected discounted and undiscounted lease payments under non-cancelable leases as of December 31, 2019, excluding non-lease components, were as follows:

Year	
2020	4,014
2021	3,225
2022	2,949
2023	2,903
2024	3,259
2025 and thereafter	35,720
Total lease payments	52,070
Less imputed interest	(18,757)
Total	$ 33,313

Operating cash flows for operating leases for the year ended 31, December 2019 were $5,326.

NOTE 15 - FINANCING INCOME, NET

	Year ended December 31,		
	2019	**2018**	**2017**
Interest income	4,605	3,352	1,834
Exchange rate income (loss), net	(1,428)	(281)	554
Bank charges	(99)	(87)	(112)
Total	$ 3,078	$ 2,984	$ 2,276

EXHIBIT INDEX

Number	Description
1.1	Amended and Restated Articles of Association (filed herewith)
2.1	Description of Securities (filed herewith)
4.2	2007 Incentive Plan, as amended (incorporated by reference to Exhibit 4.2 to the Company's Annual Report on Form 20-F filed with the Securities and Exchange Commission on February 25, 2015).
4.3	2017 Share Incentive Plan (incorporated by reference to Exhibit 99.1 to the Company's Registration Statement on Form S-8 filed with the Securities and Exchange Commission on August 25, 2017 (File No. 333-220158)).
4.4	A form of amended Indemnification Letter Agreement between the Company and its present and future directors and officers (incorporated by reference to Appendix B to Exhibit 99.1 of the Company's Report on Form 6-K filed with the Securities and Exchange Commission on May 21, 2012).
4.5	Summary of lease agreement dated May 28, 2000, as amended and supplemented on August 21, 2000, February 20, 2003, November 1, 2005, May 7, 2007, October 30, 2010, May 15, 2011, June 15, 2012, July 5, 2012, February 28, 2013, December 31, 2014, October 1, 2015 and May 25, 2016 (incorporated by reference to Exhibit 4.4 to the Company's Annual Report on Form 20-F filed with the Securities and Exchange Commission on March 3, 2017).
4.6	Compensation Policy for Executive Officers and Directors (filed herewith).
4.7+	Summary of lease agreement dated May 3, 2018, by and between the Company and Bayside Land Corporation Ltd. (incorporated by reference to Exhibit 4.7 to the Company's Annual Report on Form 20-F filed with the Securities and Exchange Commission on February 28, 2019).
4.8+	Summary of main contractor agreement dated February 3, 2019, by and between the Company and A. Weiss Construction and Supervision Ltd. (incorporated by reference to Exhibit 4.8 to the Company's Annual Report on Form 20-F filed with the Securities and Exchange Commission on February 28, 2019).
8.1	List of Subsidiaries (incorporated by reference to Exhibit 8.1 to the Company's Annual Report on Form 20-F filed with the Securities and Exchange Commission on February 28, 2019).
12.1	Certification required by Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended (filed herewith).
12.2	Certification required by Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended (filed herewith).
13.1	Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (furnished herewith).
13.2	Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (furnished herewith).
15.1	Consent of Kost Forer Gabbay & Kasierer (filed herewith).
101.INS	Inline XBRL Instance Document—the instance document does not appear in the Interactive Data File as its XBRL tags are embedded within the Inline XBRL document
101.SCH	Inline XBRL Taxonomy Extension Schema
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase
104	Cover page formatted as Inline XBRL and contained in Exhibit 101

SIGNATURES

The registrant hereby certifies that it meets all of the requirements for filing on Form 20-F and has duly caused and authorized the undersigned to sign this annual report on its behalf.

NOVA MEASURING INSTRUMENTS LTD.

By: */s/ Eitan Oppenhaim*
Eitan Oppenhaim
President and Chief Executive Officer

Date: March 12, 2020

Exhibit 1.1

NOVA MEASURING INSTRUMENTS LTD.

AMENDED AND RESTATED ARTICLES OF ASSOCIATION

As Last Amended: June 17, 2019

TABLE OF CONTENTS

AMENDED AND RESTATED ARTICLES OF ASSOCIATION
of
NOVA MEASURING INSTRUMENTS LTD.

INTERPRETATION

1. In these Articles the following terms shall bear the meanings set opposite to them, unless inconsistent with the subject or context:

T E R M S		M E A N I N G S
Articles		These Amended and Restated Articles of Association as may be amended from time to time.
Auditor		As defined under the Law.
Board		The Board of Directors of the Company.
CEO		Chief Executive Officer, also referred to under the Law as the general manager.
Class Meeting		A meeting of the holders of a class of shares.
Chairman		Chairman of the Board.
Company		Nova Measuring Instruments Ltd.
Companies Regulations		All regulations promulgated from time to time under the Companies Law.
Distribution		As defined under the Law.
External Director		As defined under the Law.
The Law or the Companies Law		The Israeli Companies Law, 5759 - 1999 and the Companies Regulations.
NIS		New Israeli Shekel
The Office		The registered office of the Company as may be re-located from time to time.
Office Holder		As defined under the Law.
Ordinary Shares		The Company's Ordinary Shares, NIS 0.01 par value each.
Register		Shareholders Register maintained by or on behalf of the Company.
Shareholder		As defined under the Law.
Simple Majority		A majority of more than fifty percent (50%) of the votes cast by those Shareholders present and voting, not taking into consideration abstaining votes.
The Statutes		The Law, the Israeli Companies Ordinance (New Version) 1983, the Securities Law, 5738 - 1968 (the "Securities Law") and all applicable laws and regulations applicable in any relevant jurisdiction (including without limitation U.S. Federal laws and regulations), and rules of any stock market in which the Company's shares are registered for trading as shall be in force from time to time and to the extent applicable to the Company.

Except as otherwise provided above or elsewhere under these Articles, any word or expression mentioned herein shall have the meaning ascribed to them under the Law, and if not applicable, the meaning ascribed to them under the Companies Regulations, and if not applicable, the meaning ascribed to them under the Securities Law, and if not applicable, the

meaning ascribed to them under the Securities Regulations promulgated under the Securities Law (herein the "Securities Regulations"), and if not applicable, the meaning ascribed to them under any other applicable law - in all cases if the meaning set forth therein does not contradict the purpose or the context of the relevant provision.

2. Words importing the singular shall include the plural, and vice-versa. Words importing the masculine gender shall include the feminine gender; and words importing persons shall include corporate bodies.

Any provision or part thereof of these Articles, prohibited by applicable law, shall be ineffective, without invalidating any other part of these Articles.

Articles 3,4,5,6 and 7 of these Articles shall be deemed to be the Memorandum of Association of the Company.

NAME OF THE COMPANY

3. The name of the Company is Nova Measuring Instruments Ltd.

PURPOSE

4. The purposes of the Company shall be to engage in the types of pursuits specified below:

   4.1 To invent, design, plan, develop, manufacture, market and trade in the field of measuring instruments in electronics, micro-electronics, medicine, chemistry, metallurgy, ceramics, and any other field.

   4.2 To initiate, participate, manage, execute, import and export any kind of project within the boarders of the State of Israel and/or outside Israel.

   4.3 To register patents, trademarks, trade names, intellectual property rights marketing rights and any other right of any kind whatsoever, both in Israel and abroad.

   4.4 To engage in any legal activity, both in Israel and abroad.

   All purposes above shall be in addition to one another and none shall derogate from the other.

4A. The Company's headquarters shall be located in Israel, unless the Board shall otherwise resolve, by a resolution approved by at least 75% of the members of the Board then in office.

PUBLIC COMPANY

5. The Company is a public company pursuant to the Companies Law.

LIMITED LIABILITY

6. The liability of each Shareholder for the Company's debts is limited to the full payment of the original issue price of the shares first allotted to such Shareholder or his predecessors. Once such price is paid by the original owner of shares, there is no further liability of the holder and such holder's transferees for the Company's debts.

CAPITAL, SHARES AND RIGHTS

7. The registered share capital of the Company is NIS 400,000 (four hundred thousand New Israeli Shekels) divided into 40,000,000 (forty million) Ordinary Shares of par value NIS 0.01 each.

8. All issued and outstanding shares of the Company of the same class are of equal rights between them for all intents and purposes concerning the rights set forth below.

9. Each issued Ordinary Share entitles its holder to the rights as described below:

   9.1 The equal right to participate in and vote at the Company's general meetings, whether ordinary meetings or special meetings, and each of the shares in the Company shall entitle the holder thereof, who is present at the meeting and participating in the vote, whether in person, or by proxy, to one vote.

   9.2 The equal right to participate in any Distribution.

   9.3 The equal right to participate in the distribution of assets available for distribution in the event of liquidation of the Company.

10. If two or more persons are registered as joint holders of any shares, any one of such persons may give effectual receipts for any dividend or other monies in respect of such share and his or her confirmation will bind all holders of such share.

11. Any payment for a share shall be initially credited against the par value of said share and any excess amount shall be credited as a premium for said share, unless determined otherwise in the conditions of the allocation.

12. A Shareholder shall not be entitled to rights as a Shareholder, including the right to dividends, unless said Shareholder fully paid all sums in accordance with the conditions of the allocation, including interest, linkage and expenses, if any, and all unless otherwise determined in the conditions of the allocation.

SHARE CERTIFICATES

13. A shareholder who is registered in the Register is entitled to receive from the Company, without payment and at such shareholder’s request, within a period of three months after the allocation or registration of the transfer, one share certificate with respect to all the shares registered in his name, which shall specify the aggregate number of the shares held by such shareholder. In the event of a jointly held share, the Company shall issue one share certificate for all the joint holders of the share, and the delivery of such certificate to one of the joint holders shall be deemed to be delivery to all of them. Every certificate shall bear the Company’s seal or a facsimile copy thereof and be signed by two Office Holders of the Company, or one director and the Company's secretary or by any other person appointed by the Board for such purpose.

14. The Company may issue a new certificate in lieu of a certificate that was issued and was lost, defaced, or destroyed, on the basis of such proof and guarantees as the Company may require, and after payment of an amount that shall be prescribed by the Company, and the Company may also replace existing certificates with new certificates, free of charge, subject to such conditions as the Company shall stipulate.

REGISTERED HOLDER

15. Except as otherwise provided in these Articles, the Company shall be entitled to treat the registered holder of any share as the absolute owner thereof, and, accordingly, shall not, except as ordered by a court of competent jurisdiction, or as required by statute, be bound to recognize any equitable or other claim to, or interest in such share on the part of any other person.

16. To the extent required by the Law a trustee must inform the Company of the fact that such trustee is holding shares of the Company in trust for another person at such time as may be required by the Law. The Company shall register that fact in the Register in respect of such shares. The trustee shall be deemed to be the sole holder of said shares.

TRANSFER OF SHARES

17. Subject to the Statutes, and subject to any applicable agreements or undertakings of any specific shareholder, the shares shall be freely transferable.

18. Transfer of registered shares shall be made in writing or any other manner, in a form specified by the Board or the transfer agent appointed by the Company, and such transfer form should be signed by both the transferee and the transferor and delivered to the Office or to such transfer agent, together with the certificates of the shares due to be transferred, if such certificates have been issued. The transferee shall be deemed to be the shareholder with respect to the transferred shares only from the date of registration of his name in the Register.

19. The Board may close the Register and suspend the registration of transfers for such period of time as the Board shall deem fit, provided that the period of closure of any such book shall not exceed 30 days each year. The Company shall notify the shareholders of such decision.

TRANSMISSION OF SHARES

20. In the case of the death, liquidation, bankruptcy, dissolution, winding-up or a similar occurrence of a Shareholder, the legal successors of such Shareholder shall be the only persons recognized by the Company as having any title to such shares, but nothing herein contained shall release the estate of the predecessor from any liability in respect of such shares.

21. The legal successors may, upon producing such evidence of title as the Board shall require, be registered themselves as holders of the shares, or subject to the provisions as to transfers herein contained, transfer the same to some other person.

ALTERATIONS OF THE REGISTERED CAPITAL

22. (a) Subject to the Statutes, a general meeting of shareholders may from time to time resolve to:

(1) Alter or add classes of shares that shall constitute the Company's authorized capital, including shares with preference rights, deferred rights, conversion rights or any other special rights or limitations.

(2) Increase the Company's registered share capital by creating new shares either of an existing class or of a new class.

(3) Consolidate and/or split all or any of its share capital into shares of larger or smaller par value than the existing shares.

(4) Cancel any registered shares not yet allocated, provided that the Company has made no commitment to allocate such shares.

(5) Reduce the Company's share capital and any reserved fund for redemption of capital.

(b) In executing any resolution adopted according to Article 22(a) above, the Board may, at its discretion, resolve any related issues.

(c) If as a result of a consolidation or split of shares authorized under these Articles, fractions of a Share will stand to the credit of any Shareholder, the Board is authorized at its discretion, to act as follows:

(1) Determine that fractions of shares that do not entitle their owners to a whole Share, will be sold by the Company and that the consideration for the sale be paid to the beneficiaries, on terms the Board may determine;

(2) Allot to every Shareholder, who holds a fraction of a Share resulting from a consolidation and/or split, shares of the class that existed prior to the consolidation and/or split, in a quantity that, when consolidated with the fraction, will constitute a whole Share, and such allotment will be considered valid immediately prior to the consolidation or split;

(3) Determine the manner for paying the amounts to be paid for shares allotted in accordance with Article 22(c)(2) above, including on account of bonus shares; and/or

(4) Determine that the owners of fractions of shares will not be entitled to receive a whole Share in respect of a Share fraction or that they may receive a whole Share with a different par value than that of the fraction of a Share.

23. Except as otherwise provided by or pursuant to these Articles or by the conditions of issue, any new share capital shall be considered as part of the original share capital, and shall be subject to the same provisions of these Articles with reference to payment of calls, lien, transfer, transmission, forfeiture and otherwise, which applies to the original share capital.

MODIFICATION OF CLASS RIGHTS

24. If at any time the share capital is divided into different classes of shares, any change to the rights and privileges of the holders of any such class of shares shall require the approval of a Class Meeting of such class of shares by a Simple Majority (unless otherwise provided by the Statutes or by the terms of issue of the shares of that class).

25. The rights and privileges of the holders of any class of shares shall not be deemed to have been altered by creating or issuing shares of any class, including a new class (unless otherwise provided by the terms of issue of the shares of that class).

BORROWING POWERS

26. The Company may, by resolution of the Board, from time to time, raise or borrow or secure the payment of any sum or sums of money for the purposes of the Company. The Company, by resolution of the Board, may also raise or secure the payment or repayment of such sum or sums in such manner and upon such terms and conditions in all respects as it deems fit, and in particular by the issue of debentures or debenture stock of the Company charged upon all or any part of the property of the Company (both present and future) including its unissued and/or its uncalled capital for the time being. Issuance of any series of debentures shall require Board approval.

GENERAL MEETINGS

27. Annual general meetings shall be held at least once a calendar year, at such place and time as determined by the Board, but not later than fifteen (15) months after the last annual general meeting. Such general meetings shall be called "Annual Meetings" and all other general meetings of the Company shall be called "Special Meetings". The Annual Meeting shall review the Company's financial statements and shall transact any other business required pursuant to these Articles or to the Law, and any other matter as shall be determined by the Board. Annual Meetings and Special Meetings shall be convened in Israel, unless the Company’s headquarters shall have been transferred to another country in accordance with the provisions of these Articles.

28. The Board may convene a Special Meeting by its resolution, and is required to convene a Special Meeting should it receive a request, in writing, from a person or persons entitled, under the Companies Law, to request such meeting.

Any request for convening a meeting must specify the purposes for which the meeting is to be called, shall be signed by the persons requesting the meeting, and shall be delivered to the Company's registered offices.

29. In addition, subject to the Law, the Board may accept a request of a shareholder holding not less than 1% of the voting rights at the general meeting to include a subject in the agenda of a general meeting, provided that such subject is a proper subject for action by shareholders under the Law and these Articles and only if the request also sets forth: (a) the name and address of the Shareholder making the request; (b) a representation that the Shareholder is a holder of record of shares of the Company, holding not less than 1% of the voting rights at the general meeting and intends to appear in person or by proxy at the meeting; (c) a description of all arrangements or understandings between the Shareholder and any other person or persons (naming such person or persons) in connection with the subject which is requested to be included in the agenda; and (d) a declaration that all the information that is required under the Law and any other applicable law to be provided to the Company in connection with such subject, if any, has been provided. In addition, if such subject includes a nomination to the Board in accordance with the Articles, the request shall also set forth the consent of each nominee to serve as a director of the Company if so elected and a declaration signed by each nominee declaring that there is no limitation under the Law for the appointment of such nominee. Furthermore, the Board, may, in its discretion to the extent it deems necessary, request that the Shareholders making the request provide additional information necessary so as to include a subject in the agenda of a general meeting, as the Board may reasonably require.

30. Subject to applicable law, the Board shall determine the agenda of any general meeting.

Notice of General Meetings

31. Unless otherwise required by the Law and these Articles, the Company is not required to give notice under section 69 of the Companies Law.

PROCEEDINGS AT GENERAL MEETINGS

Quorum

32. No business shall be transacted at any general meeting of the Company unless a quorum of Shareholders is present at the opening of the Meeting.

Except as provided in the following Article with regard to an adjourned Meeting, the quorum for any general meeting shall be the presence of at least two Shareholders in person or by proxy (including by voting deed) holding 33 1/3% or more of the voting rights in the Company. For this purpose, abstaining shareholders shall be deemed present at the Meeting.

33. If within half an hour from the time appointed for the holding of a general meeting a quorum is not present, the general meeting shall stand adjourned one day thereafter at the same time and place or to such other day, time and place as the Board may indicate in a notice to the Shareholders. At such adjourned Meeting any number of Shareholders shall constitute a quorum for the business for which the original Meeting was called.

Chairman of the General Meeting

34. The Chairman shall preside as the chairman at every general meeting, but if there shall be no such Chairman or if at any meeting the Chairman shall not be present within fifteen (15) minutes after the time appointed for holding the same, or shall be unwilling to act as chairman, then the Board members present at the meeting shall choose one of the Board members as chairman of the meeting and if they shall not do so then the Shareholders present shall choose a Board member, or if no Board member be present or if all the Board members present decline to take the chair, they shall choose any other person present to be chairman of the meeting.

35. The chairman may, with the consent of a general meeting at which a quorum is present, and shall if so directed by the general meeting, adjourn any meeting, discussion or the resolution with respect to a matter that is on the agenda, from time to time and from place to place as the meeting shall determine. Except as may be required by the Law, no Shareholder shall be entitled to any notice of an adjournment or of the business to be transacted at an adjourned meeting. No business shall be transacted at any adjourned meeting other than the business which might have been transacted at the meeting from which the adjournment took place.

36. A vote in respect of the election of the chairman of the meeting or regarding a resolution to adjourn the meeting shall be carried out immediately. All other matters shall be voted upon during the meeting at such time and order as decided by the chairman.

VOTE OF SHAREHOLDERS

37. All resolutions proposed at any general meeting will require a Simple Majority, unless otherwise required by the Statutes or these Articles. Except as otherwise required by the Statues or these Articles, alteration or amendment of these Articles shall require a Simple Majority. Notwithstanding anything in these Articles to the contrary, the provisions of Articles 4A, 27 (last sentence), 37, 50, 60(i) and 94 may only be amended by a resolution at the general meeting of the Company, provided however, that such amendment was also approved by a resolution of at least 75% of the members of the Board then in office, at a session of the Board which has taken place prior to the general meeting.

38. A declaration by the chairman of the meeting that a resolution has been carried, or has been carried unanimously or by a particular majority, or rejected, or not carried by a particular majority and an entry to that effect in the minutes of the meeting shall be prima facie evidence thereof.

39. The chairman of the meeting will not have a second and/or a casting vote. If the vote is tied with regard to a certain proposed resolution such proposal shall be deemed rejected.

40. If two or more persons are jointly entitled to a share, the vote of the senior one who tenders a vote, whether in person or by proxy, shall be accepted to the exclusion of the votes of the other registered holders of the share, and for this purpose seniority shall be determined by the order in which the names stand in the Register.

41. A proxy need not be a Shareholder of the Company.

42. The instrument appointing a proxy shall be in writing signed by the appointer or of his attorney-in-fact duly authorized in writing. A corporate entity shall vote by a representative duly appointed in writing by such entity.

Any instrument appointing a proxy or a representative of a corporate entity (whether for a specified meeting or otherwise) shall be in a form satisfactory to the Company.

43. Unless otherwise determined by the Board, the instrument of appointment must be submitted to the Office no later than 48 hours prior to the first general meeting to be attended by such proxy or representative. The instrument of appointment shall automatically terminate and cease to be of any force or affect on the anniversary (12 months) of the date of the instrument of appointment, unless such instrument sets out a different expiry date.

44. A proxy may be appointed in respect of only some of the shares held by a Shareholder, and a Shareholder may appoint more than one proxy, each empowered to vote by virtue of a portion of the shares.

45. A Shareholder being of unsound mind or pronounced to be unfit to vote by a competent court of law may vote through a legally appointed guardian or any other representative appointed by a court of law to vote on behalf of such Shareholder.

46. A Shareholder entitled to vote may signify in writing his approval of, or dissent from, or may abstain from any resolution included in a proxy instrument furnished by the Company. A proxy instrument may include resolutions pertaining to such issues which are permitted to be included in a proxy instrument according to the Statutes, and such other issues which the Board may decide, in a certain instance or in general, to allow voting through a proxy. A Shareholder voting through a proxy instrument shall be taken into account in determining the presence of a quorum as if such Shareholder is present at the meeting.

47. The chairman of the general meeting shall be responsible for recording the minutes of the general meeting and any resolution adopted.

48. The provisions of these Articles relating to general meetings shall, mutatis mutandis, apply to Class Meetings.

DIRECTORS

Powers, Number of Directors, Composition & Election

49. The Board shall have and execute all powers and/or responsibilities allocated to the Board by the Statutes and these Articles, including setting the Company's policies and supervision over the execution of the powers and responsibilities of the CEO. The Board may execute any power of the Company that is not specifically allocated by the Statutes or by these Articles to another organ of the Company.

50. The number of directors on the Board shall be no less than five (5) but no more than nine (9) and, to the extent required under applicable law, shall include at least two External Directors. The majority of the members of the Board shall be residents of Israel, unless the Company's headquarters shall have been transferred to another country in accordance with the provisions of these Articles.

51. The directors of the Company shall be elected at each Annual Meeting by a Simple Majority and shall hold office until the end of the next Annual Meeting and so long as an Annual Meeting is not convened, unless their office is vacated prior thereto in accordance with the provisions of these Articles and the Law. This Article shall not apply to the election and tenure of External Directors, in respect of whom the provisions of the Law shall apply.

52. As long as the number of directors serving on the Board is less than the maximal number of directors under Article 50, the Board can act to appoint directors to the Board.

53. hould a director cease serving the remaining directors may continue to act, provided that their number shall be not less than the minimal number of directors mentioned under Article 50 above. In the event the number of directors is less than the minimal number, the directors can act to appoint directors so the number of directors in office shall be equal to or higher than the minimal number mentioned under Article 50 above or alternatively can act to call a Special Meeting to elect directors.

54. The appointment of a director by the Board shall be in effect until the next Annual Meeting or until he or she shall cease serving in office pursuant to the provisions of these Articles.

55. The term of office of a director shall commence on the date of such director's election by the general meeting or by the Board or on a later date, should such date be determined in the resolution of appointment of the general meeting or of the Board.

Remuneration

56. The Company shall determine the remuneration of the directors, if any, in accordance with the Law.

Chairman of the Board

57. The Board shall appoint one of its members to serve as the Chairman and may replace the Chairman from time to time. The Chairman shall preside at meetings of the Board, but if at any meeting the Chairman is not present within fifteen (15) minutes after the time appointed for holding the meeting, the present directors shall choose a present director to be chairman of such meeting.

PROCEEDINGS OF THE DIRECTORS

58. The directors shall meet together for the dispatch of business, adjourn and otherwise regulate their meetings as they deem fit, subject to these Articles.

Unless otherwise determined by the Board, written notice of any meeting of the Board and the agenda setting out the matters to be discussed at such meeting, shall be given to all directors at least seventy two (72) hours (or such shorter notice as all the directors may agree) before the meeting. In urgent cases, a majority of the members of the Board may decide to hold a meeting without such notice.

Quorum

59. No business shall be transacted at any meeting of the Board unless a quorum of directors is present when a meeting is called to order. A quorum shall be deemed to exist when there are present personally or represented by an alternate director at least half of the directors then in office.

If a quorum is not present at the meeting of the Board within half an hour after the time scheduled for the meeting, the meeting may be adjourned to another time as shall be decided by the Chairman, or in his absence, the directors present at the meeting, provided that notice of twenty four (24) hours in advance shall be given to all the directors of the time of the adjourned meeting. The quorum for the commencement of the adjourned meeting shall be three members of the Board.

Methods of Attending Meetings

60. (i) A majority of the sessions of the Board (not including sessions held by use of means of communication) each year, but not less than four (4) sessions each year, shall be convened in Israel, unless the Company's headquarters shall have been transferred to another country in accordance with the provisions of these Articles; (ii) without derogating from sub-section (i) of this Article, some or all of the directors may attend meetings of the Board through computer network, telephone or any other media of communication, enabling the directors to communicate with each other, in the deemed presence of all of them, provided that due prior notice detailing the time and manner of holding a given meeting is served upon all the directors. The directors may waive the necessity of such notice either beforehand or retrospectively.

Any resolution adopted by the Board in such a meeting, pursuant to the provisions of these Articles, will be recorded in writing and signed by the Chairman (or in his absence by the chairman of the meeting), and shall be valid as if adopted at a meeting of the Board duly convened and held.

61. A resolution in writing signed by all of the directors eligible to participate in the discussion and vote on such resolution, or in respect of which all such directors have agreed (in writing by mail, fax or electronic mail) not to convene, shall be as valid and effective for all purposes as if passed at a meeting of the Board duly convened and held.

Any such resolution may consist of several counterparts, each signed by one or more directors. Such resolution in writing shall be effective as of the last date appearing on the resolution, or if the resolution is signed in two or more counterparts, as of the last date appearing on the counterparts.

62. While exercising his/her voting right, each director shall have one vote. Resolutions of the Board will be decided by a simple majority of the directors present and voting, not taking into consideration abstaining votes, except as otherwise provided in these Articles or by the Statutes. In the event the vote is tied, the Chairman of the Board shall not have a casting vote, and such resolution shall be deemed rejected.

Alternate Director

63. Subject to the Law, a director shall be entitled at any time and from time to time to appoint in writing any person who is qualified to serve as a director, to act as his/her alternate and to terminate the appointment of such person. The appointment of an alternate director does not negate the responsibility of the appointing director and such responsibility shall continue to apply to such appointing director - taking into account the circumstances of the appointment.

Alternate directors shall be entitled, while holding office, to receive notices of meetings of the Board and to attend and vote as a director at any meetings at which the appointing director is not present and generally to exercise all the powers, rights, duties and authorities and to perform all functions of the appointing director.

The document appointing an alternate director must be submitted to the Chairman of the Board at least 48 hours before the opening of the first Board meeting to be attended by such alternate director.

Committees

64. The Board may set up committees and appoint members to these committees subject to the Statutes. A resolution passed or an act done by such a committee pursuant to an authority granted to such committee by the Board shall be treated as a resolution passed or act done by the Board, unless expressly otherwise prescribed by the Board or the Statutes for a particular matter or in respect of a particular committee.

65. Meetings of committees and proceedings thereat (including the convening of the meetings, the election of the chairman and the votes) shall be governed by the provisions herein contained for regulating the meetings and proceedings of the Board so far as the same are applicable thereto and unless otherwise determined by the Board, including by an adoption of a charter governing the committee proceedings.

66. *[Reserved]*

Records & Validity of Acts

67. The resolutions of the Board shall be recorded in the Company's Minutes Book, as required under the Statutes, signed by the Chairman or the chairman of a certain meeting. Such signed minutes shall be deemed prima facie evidence of the meeting and the resolutions resolved therein.

68. All acts done bona fide by any meeting of the Board or of a committee of the Board or by any person acting as a director, shall, notwithstanding it be afterwards discovered that there was some defect in the appointment of any such director or person acting as aforesaid, or that they or any of them were disqualified, be as valid as if every such person had been duly appointed and was qualified to be a director.

Chief Executive Officer

69. The Board shall appoint at least one CEO, for such period and upon such terms as the Board deems fit.

70. The CEO shall have all managing and execution powers within the policies and guidelines set forth by the Board, and shall be under the supervision of the Board. The CEO may delegate any of his powers to his subordinates, subject to the approval of the Board; (ii)

INSURANCE, EXCULPATION, AND INDEMNITY

Insurance of Office Holders

71. The Company may insure the liability of an Office Holder, to the fullest extent permitted under the Statutes.

72. Without derogating from the aforesaid, the Company may enter into a contract to insure the liability of an officer therein for an obligation imposed on him in consequence of an act done in his capacity as an Office Holder, in any of the following cases:

72.1. A breach of the duty of care vis-a-vis the Company or vis-a-vis another person;

72.2. A breach of the fiduciary duty vis-a-vis the Company, provided that the Office Holder acted in good faith and had a reasonable basis to believe that the act would not harm the Company, or in connection with a financial sanction;

72.3. A monetary obligation imposed on him in favor of another person;

72.4. Any other matter in respect of which it is permitted or will be permitted under applicable law to insure the liability of an Office Holder in the Company, including, without limitation, matters referenced in Section 56H(b)(1) of the Securities Law.

Indemnity of Office Holders

73. The Company may indemnify an Office Holder, to the fullest extent permitted under the Statutes. Without derogating from the aforesaid, the Company may indemnify an Office Holder for a liability or expense imposed on him in consequence of an act done in his capacity as an Office Holder in the Company, as follows:

73.1. A monetary obligation imposed on him or incurred by him in favor of another person pursuant to a judgment, including a judgment given in settlement or a court approved settlement or arbitrator's award;

73.2. Reasonable legal fees, including attorney’s fees, incurred by an Office Holder in consequence of an investigation or proceeding filed against him by an authority that is authorized to conduct such investigation or proceeding, provided that such investigation or proceeding (i) concludes without the filing of an indictment against the Office Holder or (ii) concluded with the imposition of a monetary payment on the Office Holder in lieu of criminal proceedings, but the criminal offense in question does not require the proof of criminal intent, all within the meaning of the Law.

73.3. Reasonable litigation costs, including attorney’s fees, incurred by an Office Holder or which he is ordered to pay by a court, in proceedings filed against him by the Company or on its behalf or by another person, or in a criminal charge of which he is acquitted, or in a criminal charge of which he is convicted of an offence that does not require proof of criminal intent.

73.4. Any other obligation or expense in respect of which it is permitted or will be permitted under the Statutes to indemnify an Office Holder, including, without limitation, matters referenced in Section 56H(b)(1) of the Securities Law.

Advance Indemnity

74. The Company may give an advance undertaking to indemnify an Office Holder therein in respect of the following matters:

74.1. Matters as detailed in Article 73.1, provided however, that the undertaking is restricted to events, which in the opinion of the Board, are anticipated in light of the Company’s activities at the time of granting the obligation to indemnify and is limited to a sum or measurement determined by the Board as reasonable under the circumstances. The indemnification undertaking shall specify such events and sum or measurement.

74.2. Matters as detailed in Articles 73.2, 73.3 and 73.4.

Retroactive Indemnity

75. The Company may indemnify an Office Holder retroactively with respect of the matters as detailed in Article 73, subject to any applicable law.

Exculpation

76. The Company may exempt an Office Holder in advance for all or any of his liability for damage in consequence of a breach of the duty of care vis-a-vis the Company, to the fullest extent permitted under the Statutes. However, the Company may not exempt a director in advance from his liability toward the Company due to the breach of his duty of care in the event of a Distribution, as defined in the Statutes.

Insurance, Exculpation and Indemnity - General

77. The above provisions with regard to insurance, exemption and indemnity are not and shall not limit the Company in any way with regard to its entering into an insurance contract and/or with regard to the grant of indemnity and/or exemption in connection with a person who is not an Office Holder of the Company, including employees, contractors or consultants of the Company, all subject to any applicable law.

78. Articles 71 through 76 shall apply mutatis mutandis in respect of the grant of insurance, exemption and/or indemnification for persons serving on behalf of the Company as Office Holders in companies controlled by the Company, or in which the Company has an interest.

79. An undertaking to insure, exempt and indemnify an Office Holder in the Company as set forth above shall remain in full force and effect even following the termination of such Office Holder's service with the Company.

APPOINTMENT OF AN AUDITOR

80. Subject to the Statutes, the Annual Meeting shall appoint an Auditor for a period ending at the next Annual Meeting, or for a longer period, but no longer than until the third Annual Meeting after the meeting at which the Auditor has been appointed. The same Auditor may be reappointed.

Subject to the Statutes, the terms of service of the Auditor for the audit services shall be determined by the Board, at its discretion, or a committee of the Board if such determination was delegated to a committee, including undertakings or payments to the Auditor. The Board shall report the fees of the Auditor to the Annual Meeting.

INTERNAL AUDITOR

81. So long as the Company is a public company, the Board shall appoint an Internal Auditor pursuant to the recommendation of the Audit Committee.

81. The organizational superior of the Internal Auditor shall be the Chairman. The Internal Auditor shall submit a proposed annual or periodic work plan to the Audit Committee, which will approve such plan with changes as it deems fit, at its discretion.

MERGER AND REORGANIZATION

83. Notwithstanding the provisions of section 327(a) of the Companies Law, the majority required for the approval of a merger by the general meeting or by a class meeting shall be an ordinary majority of the votes of the shareholders entitled to vote and voting themselves.

SIGNATORIES

84. Signatory rights on behalf of the Company shall be determined from time to time by the Board.

DISTRIBUTIONS

85. The Board may decide on a Distribution, subject to the provisions set forth under the Law and these Articles.

86. The Board will determine the method of payment of any Distribution. The receipt of the person whose name appears on the record date on the Register as the owner of any share, or in the case of joint holders, of any one of such joint holders, shall serve as confirmation with respect to all the payments made in connection with that share and in respect of which the receipt was received. All dividends unclaimed after having been declared may be invested or otherwise used by the Directors for the benefit of the Company until claimed, provided however that the Company shall not be required to accept any claim made following the 7th anniversary of the declaration date, or an earlier date as may be determined by the Board. No unpaid dividend shall bear interest or accrue linkage differentials.

87. For the purpose of implementing any resolution concerning any Distribution, the Board may settle, as it deems fit, any difficulty that may arise with respect to the Distribution, including determining the value for the purpose of the said Distribution of certain assets, and deciding that payments in cash shall be made to the Shareholders based on the value so determined, and determining provisions with respect to fractions of shares or with respect to the non-payment of small sums.

REDEEMABLE SECURITIES

88. The Company shall be entitled to issue redeemable securities which are, or at the option of the Company may be, redeemed on such terms and in such manner as shall be determined by the Board. Redeemable securities shall not constitute part of the Company's capital, except as provided in the Law.

DONATIONS

89. The Company may make donations of reasonable amounts of money for purposes which the Board deems to be worthy causes, even if the donations are not made in relation to business considerations for increasing the Company's profits.

NOTICES

90. Subject to the Statutes, notice or any other document which the Company shall deliver and which it is entitled or required to give pursuant to the provisions of these Articles and/or the Statutes shall be delivered by the Company to any person, in any one of the following manners as the Company may choose: in person, by mail, transmission by fax or by electronic form.

Any notice or other document which shall be sent shall be deemed to have reached its destination on the third day after the day of mailing if sent by registered mail or regular mail, or on the first day after transmission if delivered in person, transmitted by fax or electronic form.

Should it be required to prove delivery, it shall be sufficient to prove that the notice or document sent contains the correct mailing, e-mail, or fax details as registered in the Register or any other address which the Shareholder submitted in writing to the Company as the address and fax or e-mail details for the submission of notices or other documents.

Notwithstanding anything to the contrary contained herein and subject to the provisions of the Statutes, a notice to a Shareholder may be served, as general notice to all Shareholders, in accordance with applicable rules and regulations of any stock market upon which the Company's shares are listed.

In cases where it is necessary to give advance notice of a particular number of days or notice which shall remain in effect for a particular period, the day the notice was sent shall be excluded and the scheduled day of the meeting or the last date of the period shall be included in the count.

Subject to the Statutes, the Company shall not be required to send notices to any Shareholder who is not registered in the Register or has not provided the Company with accurate and sufficient mailing details.

91. Any notice to be given to the Shareholders shall be given, with respect to joint shareholders, to the person whose name appears first in the Register as the holder of the said share, and any notice so given shall be sufficient notice for all holders of the said share.

92. Any notice or other document served upon or sent to any Shareholder in accordance with these Articles shall, notwithstanding that he be then deceased or bankrupt, and whether the Company received notice of his death or bankruptcy or not, be deemed to be duly served or sent in respect of any shares held by him (either alone or jointly with others) until some other person is registered in his stead as the holder or joint holder of such shares, and such service or sending shall be a sufficient service or sending on or to his heirs, executors, administrators or assigns and all other persons (if any) interested in such share.

93. The accidental omission to give notice to any Shareholder or the non-receipt of any such notice shall not cancel or annul any action made in reliance on the notice.

JURISDICTION

94. Unless the Company consents in writing to the selection of an alternative forum, the courts of the State of Israel shall be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of the Company, (ii) any action asserting a claim of breach of a fiduciary duty owed by, or other wrongdoing by, any director, officer, or other employee of the Company to the Company or the Company's shareholders, (iii) any action asserting a claim against the Company arising pursuant to any provision of the Companies Law, or these Articles, or (iv) any action to interpret, apply, enforce or determine the validity of these Articles.

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Exhibit 2.1

Description of Securities

Nova Measuring Instruments Ltd., an Israeli corporation (the “Company,” “we,” or “our”), currently has one class of securities registered under Section 12 of the Securities Exchange Act of 1934, as amended, the Company’s ordinary shares, par value NIS 0.01 per share. The following is a summary of some of the terms of our ordinary shares based on our articles of association, as may be amended and restated from time to time, and Israeli law.

The following summary is not complete and is subject to, and is qualified in its entirety by reference to, the provisions of our articles of association and Israeli law.

Name of exchange on which registered: Our ordinary shares began trading on Nasdaq on April 11, 2000 under the symbol “NVMI”. Our ordinary shares were registered for trading on the Tel Aviv Stock Exchange Ltd. in 2002 under the symbol “נובה”.

Restrictions on Securities: The ownership or voting of ordinary shares by non-residents of Israel is not restricted in any way by our articles of association or the laws of the State of Israel, except for anti-terror legislation and except that citizens of countries which are in a state of war with Israel may not be recognized as owners of ordinary shares.

Registration.

The Company was incepted and registered with the Israeli Registrar of Companies on May 17, 1993, under registration number 51-181-246-3.

Purpose of the Company. The purposes of the Company, as provided by Article 4 of our Articles, are (a) to invent, design, plan, develop, manufacture, market and trade in the field of measuring instruments in electronics, micro-electronics, medicine, chemistry, metallurgy, ceramics and any other field, (b) to initiate, participate, manage, execute, import and export any kind of project within the borders of the State of Israel and/or outside Israel, (c) to register patents, trademarks, trade names, intellectual property rights, marketing rights and any other right of any kind whatsoever, both in Israel and abroad and (d) to engage in any legal activity, both in Israel and abroad.

Share Capital.

Our authorized share capital consists of 40,000,000 ordinary shares, par value 0.01 per share. All of our issued and outstanding shares are validly issued, fully paid and non-assessable. Our ordinary shares are not redeemable and do not have any preemptive rights.

The Company currently has one class of ordinary shares, 0.01 NIS par value per share. The Articles provide that the board of directors may decide on a distribution, subject to the provisions set forth under the Israeli Companies Law, 5759-1999 (the “Companies Law”) and the Articles. Under the Companies Law, dividends may be paid out of net earnings, as calculated under that law, for the two years preceding the distribution of the dividend and retained earnings, provided that there is no reasonable concern that the dividend will prevent the company from satisfying its existing and foreseeable obligations as they become due. For more information, see the Company’s balance sheet and the statement of shareholders’ equity in the financial statements.

Each ordinary share entitles its holder to the following rights:

- the equal right to participate in and vote at general meetings of the shareholders, and each share entitles its holder thereof, who is present and participating in the vote, whether in person or by proxy, to one vote;

- the equal right to participate in any distribution; and

- the equal right to participate in the distribution of assets available for distribution in the event of liquidation of the company.

Transferring Shares

According to the Articles, our shares may be freely transferred, unless the transfer is restricted or prohibited by another agreement, undertaking or any applicable law.

Changes of Rights of Holders of the Shares.

According to the Articles, any change in the rights and privileges of the holders of any class of shares requires the approval of a class meeting of such class of shares by a simple majority (unless otherwise provided by the Companies Law or the regulations thereto or by the terms of issue of the shares of that class).

Amendments to the Articles of Association.

Our Articles may be amended by a simple majority vote of our shareholders. The amendment of certain provisions requires however the approval of at least 75% of the members of our board of directors to be obtained prior to the approval of our shareholders. These provisions provide that (i) the Company’s headquarters be located in Israel; (ii) our company’s annual and special meetings of the shareholders be convened in Israel, and that a majority, and not less than four, of the Company’s board of director sessions be convened in Israel; (iii) a majority of the members of our board of directors must be residents of Israel; and (iv) unless otherwise consented to in writing by us, the courts of the State of Israel will be the sole and exclusive forum for (a) any derivative action or proceeding on behalf of our company, (b) any action related to claims of breach of a fiduciary duty or other wrongdoing by a director, officer of other employee of our company; (c) any action arising pursuant to any provisions of the Companies Law or the Articles; or (d) any action to interpret, apply, enforce or determine the validity of the Articles.

Shareholders Meetings.

An annual meeting should be convened at least once every calendar year, and no later than 15 months after the preceding annual meeting, to review the Company's financial statements and to transact any other business required pursuant to the Articles or to the Companies Law, and any other matter which the board of directors places on the agenda of the annual meeting, at a time and place that the board of directors will determine. A special meeting may be called by the board of directors and at the demand of any of the following: two directors or one-quarter of the directors then serving; one or more shareholders who hold at least five percent of the issued and outstanding capital stock and at least one percent of the voting rights in the Company; or one or more shareholders who hold at least five percent of the voting rights in the Company.

According to the Articles, the quorum required for an ordinary meeting of shareholders is at least two shareholders present in person or by proxy who together hold or represent in the aggregate 33 1/3 % or more of the voting power. A meeting adjourned for lack of a quorum is reconvened one day thereafter at the same time and place or to such other day, time and place as our board of directors may indicate in a notice to the shareholders. At the reconvened meeting, the required quorum consists of any number of members present in person or by proxy, regardless of the number of shares represented. The Companies Law and regulations determine that prior notice of no less than 21 days should be given to the company's shareholders, prior to convening a meeting. In the event that the issue to be resolved is an issue subject to the Israeli proxy rules, a notice of no less than 35 days should be given to the company's shareholders. In some cases, a prior notice of not less than 14 days may be given to the company's shareholders.

Changes in Capital.

Our share capital may be increased or decreased by a vote of our shareholders in accordance with the Companies Law, either by creating new shares of an existing class or of a new class. Furthermore, and subject to applicable law, our shareholders may resolve to make the following changes to our share capital:

- alter or add classes of shares, including shares with preference rights, deferred rights, conversion rights or any other special rights or limitations;

- consolidate and/or split all or any of its share capital into shares of larger or smaller par value than the existing shares;

- cancel any registered shares not yet allocated, provided we have made no commitment to allocate such shares; and

- reduce our share capital and any reserved fund for redemption of capital.

Modification of Rights

According to our Articles, if our share capital is divided into different classes of shares, any change to the rights and privileges of the holders of such class will require the approval of a meeting of such class of shares by a simple majority vote.

Borrowing Powers

Pursuant to the Companies Law and our articles of association, our board of directors may exercise all powers and take all actions that are not required under law or under our articles of association to be exercised or taken by a certain organ of the Company, including the power to borrow money for company purposes.

Acquisition of a Controlling Stake.

According to the CompaniesLaw, an acquisition pursuant to which a purchaser will hold a "controlling stake", that is defined as 25% or more of the voting rights if no other shareholder holds a controlling stake, or an acquisition pursuant to which such purchaser will hold more than 45% of the voting rights of the company if no other shareholder owns more than 45% of the voting rights, may not be performed by way of market accumulation, but only by way of a special tender offer (as defined in the Companies Law) made to all of the company's shareholders on a pro rata basis. A special tender offer may not be consummated unless a majority of the shareholders who announced their stand on such offer have accepted it (in counting the total votes of such shareholders, shares held by the controlling shareholders, shareholders who have personal interest in the offer, shareholders who own 25% or more of the voting rights in the company, relatives or representatives of any of the above or the bidder and corporations under their control, shall not be taken into account). A shareholder may be free to object to such an offer without such objection being deemed as a waiver of his right to sell its respective shares if the transaction is approved by a majority of the company's shareholders despite his objection. Shares purchased not in accordance with those provisions will become "dormant shares" and will not grant the purchaser any rights so long as they are held by the purchaser.

Acquisition.

A person wishing to acquire shares or a class of shares of an Israeli public company and who would, as a result, own more than 90% of the target company's issued and outstanding share capital or of certain class of its shares, is required by the Companies Law to make a full tender offer (as defined in the Companies Law) to all of the company's shareholders for the purchase of all of the issued and outstanding shares of the company or class of shares. If either (i) the shareholders who do not accept the offer hold, in the aggregate, less than 5% of the issued and outstanding share capital of the company or of the applicable class, and more than half of the shareholders who do not have a personal interest in the offer accept the offer, or (ii) the shareholder who do not accept the offer hold less than 2% of the issued and outstanding share capital of the company or of the applicable class, then all of the shares that the acquirer offered to purchase will be transferred to the acquirer by operation of law. However, a shareholder that had its shares so transferred, whether or not it accepted the tender offer (unless otherwise provided in the offering memorandum), may, within six (6) months from the date of acceptance of the tender offer, petition the court to determine that the tender offer was for less than fair value and that the fair value should be paid as determined by the court. If the shareholders who did not accept the tender offer hold at least 5% of the issued and outstanding share capital of the company or of the applicable class of shares, the acquirer may not acquire shares of the company that will increase its holdings to more than 90% of the company's issued and outstanding share capital or of the applicable class from shareholders who accepted the tender offer.

The Companies Law provides that corporate mergers require the approval of both companies' boards of directors and shareholders. In the event, however, that shares of the target company are held by the acquiring company or by a person holding 25% or more of any type of controlling means of the acquiring company, the merger will not be approved if a majority of the shareholders of the target company attending and voting at the meeting at which the merger is considered (without taking into account, for that purpose, the shares held by the acquiring company or by a person holding 25% or more of any type of controlling means of the acquiring company) object to and do not vote in favor of the merger. If a person holds 25% or more of any type of controlling means of more than one merging company, the same provisions shall apply with regard to the shareholders' vote with respect to each such company. Upon the request of a creditor of either party to the proposed merger, the court may delay or prevent the merger if the court concludes that there exists a reasonable concern that as a result of the merger the surviving company will be unable to satisfy the target company's obligations. Furthermore, a merger may not close unless at least 30 days have passed from the time that the general meeting of each ofthe merging companies was held and at least 50 days have passed from the date on which the merger proposal was sent to the Israeli Registrar of Companies.

Exhibit 4.6

COMPENSATION POLICY

NOVA MEASURING INSTRUMENTS LTD.

Compensation Policy for Executive Officers and Directors

(As Adopted on June 17, 2019)

Table of Contents

A. <u>Overview and Objectives</u>

1. **Introduction**

This document sets forth the Compensation Policy for Executive Officers and Directors (this **"Compensation Policy"**or **"Policy")**of Nova Measuring Instruments Ltd. **("Nova"**or the **"Company"),**in accordance with the requirements of the Companies Law, 5759-1999 (the **"Companies Law").**

Compensation is a key component of Nova's overall human capital strategy to attract, retain, reward, and motivate highly skilled individuals that will enhance Nova's value and otherwise assist Nova to reach its business and financial long-term goals. Accordingly, the structure of this Policy is established to tie the compensation of each officer to Nova's goals and performance.

For purposes of this Policy, "Executive Officers" shall mean "Office Holders" as such term is defined in Section 1 of the Companies Law, excluding, unless otherwise expressly indicated herein, Nova's directors.

This policy is subject to applicable law and is not intended, and should not be interpreted as limiting or derogating from, provisions of applicable law to the extent not permitted.

This Policy shall apply to compensation agreements and arrangements which will be approved after the date on which this Policy is adopted and shall serve as Nova's Compensation Policy for three (3) years, commencing as of its adoption.

The Compensation Committee and the Board of Directors of Nova (the "**Compensation Committee**" and the "**Board**", respectively) shall review and reassess the adequacy of this Policy from time to time, as required by the Companies Law..

2. **Objectives**

Nova's objectives and goals in setting this Policy are to attract, motivate and retain highly experienced leaders who will contribute to Nova's success and enhance shareholder value, while demonstrating professionalism in a highly achievement-oriented culture that is based on merit and rewards excellent performance in the long term, and embedding Nova's core values as part of a motivated behavior. To that end, this Policy is designed, among others:

2.1. To closely align the interests of the Executive Officers with those of Nova's shareholders in order to enhance shareholder value;

2.2. To align a significant portion of the Executive Officers' compensation with Nova's short and long-term goals and performance;

2.3. To provide the Executive Officers with a structured compensation package, including competitive salaries, performance-motivating cash and equity incentive programs and benefits, and to be able to present to each Executive Officer an opportunity to advance in a growing organization;

2.4. To strengthen the retention and the motivation of Executive Officers in the long term;

2.5. To provide appropriate awards in order to incentivize superior individual excellency and corporate performance; and

2.6. To maintain consistency in the way Executive Officers are compensated.

3. **Compensation Instruments**

Compensation instruments under this Policy may include the following:

3.1. Base salary;

3.2. Benefits;

3.3. Cash bonuses;

3.4. Equity based compensation; and

3.5. Retirement and termination terms.

4. **Overall Compensation - Ratio Between Fixed and Variable Compensation**

4.1. This Policy aims to balance the mix of "Fixed Compensation" (comprised of base salary and benefits) and "Variable Compensation" (comprised of cash bonuses and equity-based compensation) in order to, among other things, appropriately incentivize Executive Officers to meet Nova's short- and long-term goals while taking into consideration the Company's need to manage a variety of business risks.

4.2. The total annual bonus and equity-based compensation of each Executive Officer shall not exceed 90% of the total compensation package of such Executive Officer on an annual basis.

5. **Inter-Company Compensation Ratio**

5.1. In the process of drafting and updating this Policy, Nova's Board and Compensation Committee have examined the ratio between employer cost associated with the engagement of the Executive Officers, including directors, and the average and median employer cost associated with the engagement of Nova's other employees (including contractor employees as defined in the Companies Law) (the "**Ratio**").

5.2. The possible ramifications of the Ratio on the daily working environment in Nova were examined and will continue to be examined by Nova from time to time in order to ensure that levels of executive compensation, as compared to the overall workforce will not have a negative impact on work relations in Nova.

B. <u>Base Salary and Benefits</u>

6. **Base Salary**

6.1. A base salary provides stable compensation to Executive Officers and allows Nova to attract and retain competent executive talent and maintain a stable management team. The base salary varies among Executive Officers, and is individually determined according to the educational background, prior vocational experience, qualifications, company's role, business responsibilities and the past performance of each Executive Officer.

6.2. Since a competitive base salary is essential to Nova's ability to attract and retain highly skilled professionals, Nova will seek to establish a base salary that is competitive with base salaries paid to Executive Officers in a peer group of other companies operating in technology sectors which are similar in their characteristics to Nova's, as much as possible, while considering, among others, such companies' size and characteristics including their revenues, profitability rate, number of employees and operating arena (in Israel or globally), the list of which shall be reviewed and approved by the Compensation Committee at least every two years. To that end, Nova shall utilize as a reference, comparative market data and practices, which will include a compensation survey that compares and analyses the level of the overall compensation package offered to an Executive Officer of the Company with compensation packages in similar positions to that of the relevant officer) in such companies. Such compensation survey may be conducted internally or through an external independent consultant. Information on such compensation survey shall be included in the proxy statement published in connection with the annual general meeting of Nova's shareholders.

6.3. The Compensation Committee and the Board may periodically consider and approve base salary adjustments for Executive Officers. The main considerations for salary adjustment are similar to those used in initially determining the base salary, but may also include change of role or responsibilities, recognition for professional achievements, regulatory or contractual requirements, budgetary constraints or market trends. The Compensation Committee and the Board will also consider the previous and existing compensation arrangements of the Executive Officer whose base salary is being considered for adjustment.

7. **Benefits**

7.1. The following benefits may be granted to the Executive Officers in order, among other things, to comply with legal requirements:

7.1.1. Vacation days in accordance with market practice;

7.1.2. Sick days in accordance with market practice;

7.1.3. Convalescence pay according to applicable law;

7.1.4. Monthly remuneration for a study fund, as allowed by applicable law and with reference to Nova's practice and the practice in peer group companies;

7.1.5. Nova shall contribute on behalf of the Executive Officer to an insurance policy or a pension fund, as allowed by applicable law and with reference to Nova's policies and procedures and the practice in peer group companies; and

7.1.6. Nova shall contribute on behalf of the Executive Officer towards work disability insurance, as allowed by applicable law and with reference to Nova's policies and procedures and to the practice in peer group companies.

7.2. Non-Israeli Executive Officers may receive other similar, comparable or customary benefits as applicable in the relevant jurisdiction in which they are employed. Such customary benefits shall be determined based on the methods described in Section 6.2 of this Policy (with the necessary changes).

7.3. In the event of relocation of an Executive Officer to another geography, such Executive Officer may receive other similar, comparable or customary benefits as applicable in the relevant jurisdiction in which he or she is employed or additional payments to reflect adjustments in cost of living. Such benefits shall include reimbursement for out of pocket one-time payments and other ongoing expenses, such as housing allowance, car allowance, and home leave visit, etc.

7.4. Nova may offer additional benefits to its Executive Officers, which will be comparable to customary market practices, such as, but not limited to: cellular and land line phone benefits, company car and travel benefits, reimbursement of business travel including a daily stipend when traveling and other business related expenses, insurances, other benefits(such as newspaper subscriptions, academic and professional studies), etc., provided, however, that such additional benefits shall be determined in accordance with Nova's policies and procedures.

C. <u>Cash Bonuses</u>

8. **Annual Cash Bonuses - The Objective**

8.1. Compensation in the form of an annual cash bonus is an important element in aligning the Executive Officers' compensation with Nova's objectives and business goals. Therefore, a pay-for-performance element, as payout eligibility and levels are determined based on actual financial and operational results, as well as individual performance.

8.2. An annual cash bonus may be awarded to Executive Officers upon the attainment of pre-set periodical objectives and individual targets determined by the Compensation Committee (and, if required by law, by the Board) at the beginning of each calendar year, or upon engagement, in case of newly hired Executive Officers, taking into account Nova's short and long-term goals, as well as its compliance and risk management policies. The Compensation Committee and the Board shall also determine applicable minimum thresholds (based on annual budget revenue and/or positive non-GAAP operating income) that must be met for entitlement to the annual cash bonus (all or any portion thereof) and the formula for calculating any annual cash bonus payout, with respect to each calendar year, for each Executive Officer. In special circumstances, as determined by the Compensation Committee and the Board (e.g., regulatory changes, significant changes in Nova's business environment, a significant organizational change and a significant merger and acquisition events), the Compensation Committee and the Board may modify the objectives and/or their relative weights during the calendar year.

8.3. The total annual cash bonuses awarded to all of Nova's Executive Officers shall not exceed 10% of Nova's non-GAAP operating income.

8.4. In the event the employment of an Executive Officer is terminated prior to the end of a fiscal year, the Company may pay such Executive Officer a full annual cash bonus or a prorated one. Such bonus will become due on the same scheduled date for annual cash bonus payments by the Company.

8.5. The actual annual cash bonus to be awarded to Executive Officers shall be approved by the Compensation Committee and the Board.

9. **Annual Cash Bonuses - The Formula**

<u>Executive Officers other than the CEO</u>

9.1. The annual cash bonus of Nova's Executive Officers, other than the chief executive officer (the "**CEO**"), will be based on performance objectives and a discretionary evaluation of the Executive Officer's overall performance by the CEO and subject to minimum thresholds. The performance objectives will be approved by Nova's CEO at the commencement of each calendar year (or upon engagement, in case of newly hired Executive Officers or in special circumstances as indicated in Section 8.2 above) on the basis of, but not limited to, company, division and individual objectives. The performance measurable objectives, which include the objectives and the weight to be assigned to each achievement in the overall evaluation, will be based on:

9.1.1. Overall company performance measures, which are based on actual financial and operational results, such as revenues, sales, operating income and cash flow. At least 30% of the annual cash bonus of Nova's Executive Officers will be based on overall company performance measures; and

9.1.2. Divisional objectives which may include operational objectives, such as market share, initiation of new markets and products and operational efficiency, customer focus objectives, such as system availability requirements and customer satisfaction, project milestones objectives, such as product implementation in production, product acceptance and new product penetration, and investment in human capital objectives, such as employee satisfaction, employee retention and employee training and leadership programs.

9.2. Information on the CEO's performance measurable objectives shall be included in the proxy statement published in connection with the annual general meeting of Nova's shareholders.

9.3. The target annual cash bonus that an Executive Officer, other than the CEO, will be entitled to receive for any given calendar year, will not exceed 100% of such Executive Officer's annual base salary.

9.4. The maximum annual cash bonus including for overachievement performance that an Executive Officer, other than the CEO, will be entitled to receive for any given calendar year, will not exceed 150% of such Executive Officer's annual base salary.

<u>CEO</u>

9.5. The annual cash bonus of Nova's CEO will be mainly based on performance measurable objectives and subject to minimum thresholds as provided in Section 8.2 above. Such performance measurable objectives will be determined annually by Nova's Compensation Committee (and, if required by law, by Nova's Board) at the commencement of each calendar year (or upon engagement, in case of newly hired CEO or in special circumstances as indicated in Section 8.2 above) on the basis of, but not limited to, company and personal objectives. These performance measurable objectives, which include the objectives and the weight to be assigned to each achievement in the overall evaluation, will be categorized as described below:

9.5.1. Between 40%-60% will be based on overall company performance measures, which are based on actual financial and operational results, such as revenues, sales, operating income and cash flow; and

9.5.2. Between 20%-50% will be based on goals set forth in the Company's annual operating plan and long-term plan, such as expansion of the Company's organic growth engines and achieving strategic technology objectives.

9.6. The less significant part of the annual cash bonus granted to Nova's CEO, and in any event not more than 30% of the annual cash bonus, may be based on a discretionary evaluation of the CEO's overall performance by the Compensation Committee and the Board based on quantitative and qualitative criteria.

9.7. The target annual cash bonus that the CEO will be entitled to receive for any given calendar year, will not exceed 150% of his or her annual base salary.

9.8. The maximum annual cash bonus including for overachievement performance that the CEO will be entitled to receive for any given calendar year, will not exceed 200% of his or her annual base salary.

10. **Other Bonuses**

10.1. <u>Special Bonus</u>. Nova may grant its Executive Officers a special bonus as an award for special achievements (such as in connection with mergers and acquisitions, offerings, achieving target budget or business plan under exceptional circumstances or special recognition in case of retirement) at the CEO's discretion (and in the CEO's case, at the Board's discretion), subject to any additional approval as may be required by the Companies Law (the "**Special Bonus**"). The Special Bonus will not exceed 30% of the Executive Officer's total compensation package on an annual basis.

10.2. Signing Bonus. Nova may grant a newly recruited Executive Officer a signing bonus at the CEO's discretion (and in the CEO's case, at the Board's discretion), subject to any additional approval as may be required by the Companies Law (the "**Signing Bonus**"). The Signing Bonus will not exceed three (3) monthly entry base salaries of the Executive Officer.

10.3. Relocation Bonus. Nova may grant its Executive Officers a special bonus in the event of relocation of an Executive Officer to another geography (the "**Relocation Bonus**"). The Relocation bonus will include customary benefits associated with such relocation and its monetary value will not exceed 30% of the Executive Officer's annual base salary.

11. **Compensation Recovery ("Clawback")**

11.1. In the event of an accounting restatement, Nova shall be entitled to recover from its Executive Officers the bonus compensation or performance-based equity compensation in the amount in which such compensation exceeded what would have been paid under the financial statements, as restated, provided that a claim is made by Nova prior to the second anniversary of fiscal year end of the restated financial statements.

11.2. Notwithstanding the aforesaid, the compensation recovery will not be triggered in the following events:

11.2.1. The financial restatement is required due to changes in the applicable financial reporting standards; or

11.2.2. The Compensation Committee has determined that Clawback proceedings in the specific case would be impossible, impractical or not commercially or legally efficient.

11.3. Nothing in this Section 11 derogates from any other "Clawback" or similar provisions regarding disgorging of profits imposed on Executive Officers by virtue of applicable securities laws.

D. Equity Based Compensation

12. **The Objective**

12.1. The equity-based compensation for Nova's Executive Officers is designed in a manner consistent with the underlying objectives in determining the base salary and the annual cash bonus, with its main objectives being to enhance the alignment between the Executive Officers' interests with the long-term interests of Nova and its shareholders, and to strengthen the retention and the motivation of Executive Officers in the long term. In addition, since equity-based awards are structured to vest over several years, their incentive value to recipients is aligned with longer-term strategic plans.

12.2. The equity-based compensation offered by Nova is intended to be in a form of share options and/or other equity based awards, such as RSUs, in accordance with the Company's equity incentive plan in place as may be updated from time to time.

12.3. Equity-based compensation awarded by the Company to employees, Executive Officers or directors shall not be, in the aggregate, in excess of 10% of the Company's share capital on a fully diluted basis at the date of the grant.

12.4. All equity-based incentives granted to Executive Officers shall be subject to vesting periods in order to promote long-term retention of the awarded Executive Officers. Unless determined otherwise in a specific award agreement approved by the Compensation Committee and the Board, grants to Executive Officers other than directors shall vest gradually over a period of between three (3) to five (5) years or based on performance. The exercise price of options shall be determined in accordance with Nova's Equity-Based Compensation Policy, the main terms of which shall be disclosed in the annual report of Nova.

12.5. All other terms of the equity awards shall be in accordance with Nova's incentive plans and other related practices and policies. Accordingly, the Board may, following approval by the Compensation Committee, extend the period of time for which an award is to remain exercisable and make provisions with respect to the acceleration of the vesting period of any Executive Officer's awards, including, without limitation, in connection with a corporate transaction involving a change of control, subject to any additional approval as may be required by the Companies Law.

13. **General Guidelines for the Grant of Awards**

13.1. The equity-based compensation shall be granted from time to time and be individually determined and awarded according to the performance, educational background, prior business experience, qualifications, role and the personal responsibilities of the Executive Officer.

13.2. In determining the equity-based compensation granted to each Executive Officer, the Compensation Committee and Board shall consider the factors specified in Section 13.1 above, and in any event the total fair market value of an annual equity-based compensation at the time of grant shall not exceed: (i) with respect to the CEO - 500% of the CEO's annual base salary; and (ii) with respect to each of the other Executive Officers - 300% of such Executive Officer's annual base salary.

13.3. The fair market value of the equity-based compensation for the Executive Officers will be determined according to acceptable valuation practices at the time of grant.

E. Retirement and Termination of Service Arrangements

14. **Advanced Notice Period**

Nova may provide an Executive Officer, other than the CEO, according to his/her seniority in the Company, his/her contribution to the Company's goals and achievements and the circumstances of retirement and the CEO a prior notice of termination of up to three (3) months, during which the Executive Officer may be entitled to all of the compensation elements, and to the continuation of vesting of his/her options.

15. **Adjustment Period**

Nova may provide an additional adjustment period of up to nine (9) months to an Executive Officer, other than the CEO, according to his/her seniority in the Company, his/her contribution to the Company's goals and achievements and the circumstances of retirement and to the CEO, during which the Executive Officer may be entitled to all of the compensation elements, and to the continuation of vesting of his/her options.

16. **Additional Retirement and Termination Benefits**

Nova may provide additional retirement and terminations benefits and payments as may be required by applicable law (e.g., mandatory severance pay under Israeli labor laws), or which will be comparable to customary market practices.

17. **Non-**Compete **Grant**

Upon termination of employment and subject to applicable law, Nova may grant to its Executive Officers a non-compete grant as an incentive to refrain from competing with Nova for a defined period of time. The terms and conditions of the non-compete grant shall be decided by the Board and shall not exceed such Executive Officer's monthly base salary multiplied by twelve (12).

18. Limitation Retirement and Termination of Service Arrangements

The total non-statutory payments under Section 14-17 above shall not exceed the Executive Officer's monthly base salary multiplied by twenty-four (24).

F. Exculpation, Indemnification and Insurance

19. Exculpation

Nova may exempt its directors and Executive Officers in advance for all or any of his/her liability for damage in consequence of a breach of the duty of care vis-a-vis Nova, to the fullest extent permitted by applicable law.

20. Insurance and Indemnification

20.1. Nova may indemnify its directors and Executive Officers to the fullest extent permitted by applicable law, for any liability and expense that may be imposed on the director or the Executive Officer, as provided in the indemnity agreement between such individuals and Nova, all subject to applicable law and the Company's articles of association.

20.2. Nova will provide directors' and officers' liability insurance (the **"Insurance Policy")** for its directors and Executive Officers as follows:

20.2.1. The annual premium to be paid by the Nova shall not exceed 2% of the aggregate coverage of the Insurance Policy;

20.2.2. The limit of liability of the insurer shall not exceed the greater of $50 million or 30% of the Company's shareholders equity based on the most recent financial statements of the Company at the time of approval by the Compensation Committee; and

20.2.3. The Insurance Policy, as well as the limit of liability and the premium for each extension or renewal shall be approved by the Compensation Committee (and, if required by law, by the Board) which shall determine that the sums are reasonable considering Nova's exposures, the scope of coverage and the market conditions and that the Insurance Policy reflects the current market conditions, and it shall not materially affect the Company's profitability, assets or liabilities.

20.3. Upon circumstances to be approved by the Compensation Committee (and, if required by law, by the Board), Nova shall be entitled to enter into a "run off" Insurance Policy of up to seven (7) years, with the same insurer or any other insurance, as follows:

20.3.1. The limit of liability of the insurer shall not exceed the greater of $50 million or 30% of the Company's shareholders equity based on the most recent financial statements of the Company at the time of approval by the Compensation Committee;

20.3.2. The annual premium shall not exceed 300% of the last paid annual premium; and

20.3.3. The Insurance Policy, as well as the limit of liability and the premium for each extension or renewal shall be approved by the Compensation Committee (and, if required by law, by the Board) which shall determine that the sums are reasonable considering the Company's exposures covered under such policy, the scope of cover and the market conditions, and that the Insurance Policy reflects the current market conditions and that it shall not materially affect the Company's profitability, assets or liabilities.

20.4. Nova may extend the Insurance Policy in place to include cover for liability pursuant to a future public offering of securities as follows:

20.4.1. The additional premium for such extension of liability coverage shall not exceed 50% of the last paid annual premium; and

20.4.2. The Insurance Policy, as well as the additional premium shall be approved by the Compensation Committee (and if required by law, by the Board) which shall determine that the sums are reasonable considering the exposures pursuant to such public offering of securities, the scope of cover and the market conditions and that the Insurance Policy reflects the current market conditions, and it does not materially affect the Company's profitability, assets or liabilities.

G. Arrangements upon Change of Control

21. The following benefits may be granted to the Executive Officers in addition to the benefits applicable in the case of any retirement or termination of service upon a "Change of Control":

21.1. Vesting acceleration of outstanding options or other equity-based awards;

21.2. Extension of the exercising period of options for Nova's Executive Officer for a period of up to one (1) year in case of an Executive Officer other than the CEO and two (2) years in case of the CEO, following the date of employment termination; and

21.3. Up to an additional six (6) months of continued base salary and benefits following the date of employment termination (the "**Additional Adjustment Period**"). For avoidance of doubt, such additional Adjustment Period shall be in addition to the advance notice and adjustment periods pursuant to Sections 14 and 15 of this Policy, but subject to the limitation set forth in Section 18 of this Policy.

21.4. A cash bonus not to exceed 150% of the Executive Officer's annual base salary in case of an Executive Officer other than the CEO and 200% in case of the CEO.

H. Board of Directors Compensation

22. The following benefits may be granted to Nova's Board members: All Nova's Board members, excluding the chairman of the Board, shall be entitled to an equal annual and per-meeting compensation.

22.2. The compensation of the Company's directors (including external directors and independent directors) shall be in accordance with the Companies Regulations (Rules Regarding the Compensation and Expenses of an External Director), 5760-2000, as amended by the Companies Regulations (Relief for Public Companies Traded in Stock Exchange Outside of Israel), 5760-2000, as such regulations may be amended from time to time ("**Compensation of Directors Regulations**") and, in any event, the annual payment and the per-meeting payment shall not be greater than two (2) times the maximal annual payment and per-meeting payment, respectively, allowed under the Compensation of Directors Regulations, in the case of Nova.

22.3. Notwithstanding the provisions of Sections 22.1 and 22.2 above, in special circumstances, such as in the case of a professional director, an expert director or a director who makes a unique contribution to the Company, such director's compensation may be different than the compensation of all other directors and maybe greater than the maximal amount allowed, in the case of Nova, by the Compensation of Directors Regulations.

22.4. The chairman of the Board shall be entitled to a base compensation that shall not exceed six (6) times the compensation of a director (including annual and per meeting compensation and excluding equity compensation).

22.5. Each member of Nova's Board (excluding the chairman of the Board) may be granted annually equity-based awards with a total fair market value of up to US$150,000. The equity-based awards shall vest annually over a period of between three (3) to four (4) years.

22.6. The chairman of the Board may be granted up to an average annual equity compensation (of two (2) sequential years) that shall not exceed six (6) times of any director's equity compensation per year.

22.7. In addition, members of Nova's Board may be entitled to reimbursement of expenses when traveling abroad on behalf of Nova.

22.8. It is hereby clarified that the compensation stated under Section H will not apply to directors who serve as Executive Officers.

I. Miscellaneous

23. Nothing in this Policy shall be deemed to grant any of Nova's Executive Officers or employees or any third party any right or privilege in connection with their employment by the Company. Such rights and privileges shall be governed by the respective personal employment agreements. The Board may determine that none or only part of the payments, benefits and perquisites detailed in this Policy shall be granted, and is authorized to cancel or suspend a compensation package or part of it.

24. An Immaterial Change in the Terms of Employment of an Executive Officer other than the CEO may be approved by the CEO, provided that the amended terms of employment are in accordance with this Policy. An "Immaterial Change in the Terms of Employment" means a change in the terms of employment of an Executive Officer with an annual total cost to the Company not exceeding an amount equal to two (2) monthly base salaries of such employee.

25. In the event that new regulations or law amendment in connection with Executive Officers and directors compensation will be enacted following the adoption of this Policy, Nova may follow such new regulations or law amendments, even if such new regulations are in contradiction to the compensation terms set forth herein.

****

This Policy is designed solely for the benefit of Nova and none of the provisions thereof are intended to provide any rights or remedies to any person other than Nova.

Exhibit 12.1

CERTIFICATION

I, Eitan Oppenhaim, certify that:

1. I have reviewed this annual report on Form 20-F of Nova Measuring Instruments Ltd.

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;

4. The company's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and

5. The company's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of company's board of directors (or persons performing the equivalent function):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

Date: March 12, 2020

/s/*Eitan Oppenhaim*
Eitan Oppenhaim
President and Chief Executive Officer

Exhibit 12.2

CERTIFICATION

I, Dror David, certify that:

1. I have reviewed this annual report on Form 20-F of Nova Measuring Instruments Ltd.

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;

4. The company's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and

5. The company's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of company's board of directors (or persons performing the equivalent function):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

Date: March 12, 2020

/s/*Dror David*
Dror David
Chief Financial Officer

Exhibit 13.1

CERTIFICATION PURSUANT TO SECTION 906
OF THE SARBANES-OXLEY ACT OF 2002

I, Eitan Oppenhaim, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, to my knowledge, that:

1. This Annual Report on Form 20-F of Nova Measuring Instruments Ltd. (the "Company") for the period ended December 31, 2019 (the "Report") fully complies with the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 12, 2020

/s/ Eitan Oppenhaim
Eitan Oppenhaim
President and Chief Executive Officer

Exhibit 13.2

CERTIFICATION PURSUANT TO SECTION 906
OF THE SARBANES-OXLEY ACT OF 2002

I, Dror David, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, to my knowledge, that:

1. This Annual Report on Form 20-F of Nova Measuring Instruments Ltd. (the “Company”) for the period ended December 31, 2019 (the “Report”) fully complies with the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 12, 2020

/s/ Dror David
Dror David
Chief Financial Officer

Exhibit 15.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference, in Registration Statement Nos. 333-147140, 333-184585, 333-202550 and 333- 220158 on Form S-8 of our reports dated March 9, 2020, relating to the consolidated financial statements of Nova Measuring Instruments Ltd. (the “Company”), and the effectiveness of Company's internal control over financial reporting, included in this Annual Report on Form 20-F of the Company for the year ended December 31, 2019.

/s/ Kost Forer Gabbay & Kasierer
Kost Forer Gabbay & Kasierer
A member of Ernst & Young

Tel Aviv, Israel
March 12, 2020