II-VI INC
Form 10-K
August 26, 2016

United States

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

x Annual Report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934
for the fiscal year ended June 30, 2016

¨Transition report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934
for the transition period from to .

Commission File Number: 0-16195

II-VI INCORPORATED

(Exact name of registrant as specified in its charter)

PENNSYLVANIA (State or other jurisdiction of incorporation or organization)	25-1214948 (I.R.S. Employer Identification No.)
375 Saxonburg Boulevard Saxonburg, PA (Address of principal executive offices)	16056 (Zip code)

Registrant's telephone number, including area code: 724-352-4455

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

Title of Each Class	Name of Each Exchange on Which Registered

Common Stock, no par value Nasdaq Global Select Market

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

None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes x No ¨

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange Act. Yes ¨ No x

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes x No ¨

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 during the preceding 12 months (or for shorter period that the registrant was required to submit and post such files). Yes x No ¨

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ¨

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

Large accelerated filer x Accelerated filer ¨

Non-accelerated filer ¨ (Do not check if a smaller reporting company) Smaller reporting company ¨

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ¨ No x

Aggregate market value of outstanding Common Stock, no par value, held by non-affiliates of the Registrant at December 31, 2015, was approximately $1,100,264,770 based on the closing sale price reported on the Nasdaq Global Select Market. For purposes of this calculation only, directors and executive officers of the Registrant and their spouses are deemed to be affiliates of the Registrant.

Number of outstanding shares of Common Stock, no par value, at August 19, 2016, was 62,637,200.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement, which will be issued in connection with the 2016 Annual Meeting of Shareholders of II-VI Incorporated, are incorporated by reference into Part III of this Annual Report on Form 10-K.

Forward-Looking Statements

This Annual Report on Form 10-K (including certain information incorporated herein by reference) contains forward-looking statements made pursuant to Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These statements can be identified as those that may predict, forecast, indicate or imply future results, performance or advancements and by forward-looking words such as "expects," "anticipates," "intends," "plans," "projects," "believes," "estim or similar expressions. Forward-looking statements address, among other things, our expectations, our growth strategies, our efforts to increase bookings, sales and revenues, projections of our future profitability, results of operations, capital expenditures, our financial condition or other "forward-looking" information and include statements about revenues, earnings, spending, margins, costs or our actions, plans or strategies.

The forward-looking statements in this Annual Report on Form 10-K involve risks and uncertainties, which could cause actual results, performance or trends to differ materially from those expressed in the forward-looking statements herein or in previous disclosures. II-VI Incorporated believes that all forward-looking statements made by it have a reasonable basis, but there can be no assurance that these expectations, beliefs or projections will actually occur or prove to be correct. Actual results could materially differ from such statements.

The following factors, among others, in some cases have affected and in the future could affect our financial performance and actual results, and could cause actual results for fiscal 2016 and beyond to differ materially from those expressed or implied in any forward-looking statements included in this Annual Report on Form 10-K or otherwise made by our management:

- Our future success depends on continued international sales,
- Our competitive position depends on our ability to develop new products and processes,
- Investments in future markets of potential significant growth may not result in expected returns,
- We may fail to accurately estimate our customers' demand,
- Global economic downturns may adversely affect our business, operating results and financial condition,
- Our global operations are complex to manage,
- We have entered into supply agreements which commit us to supply products on specified terms,
- We depend on highly complex manufacturing processes that require products from limited sources of supply,
- Our global operations are subject to complex legal and regulatory requirements,
- We may encounter substantially increased competition,
- Our competitive position may require significant investments in strategic acquisitions,
- Declines in the operating performance of one of our business segments could result in an impairment of the segment's goodwill and indefinite-lived intangible assets,
- There are limitations on the protection of our intellectual property,
- We are subject to governmental import and export regulations,
- We have agreements with government entities,
- We use and generate hazardous substances that are subject to stringent environmental regulations,
- We may be adversely affected by climate change regulations,
- Data breach incidents and breakdown of information and communication technologies could disrupt our operations and impact our financial results,

- Some systems that use our products are complex in design, and our products may contain defects that are not detected until deployed which could increase our costs and reduce our revenues,
- Significant defense spending cuts and/or reductions in defense programs could adversely impact our business,

- Change in tax rates, tax liabilities or tax accounting rules could affect future results,
- Our success depends on our ability to retain key personnel,
- Natural disasters or other global or regional catastrophic events could disrupt our operations and adversely affect our results,
- A significant portion of our business depends on cyclical industries,
- Increases in commodity prices may adversely affect our results of operations and financial condition,
- Regulations related to conflict minerals could adversely impact our business,
- The market price of our common stock can be highly volatile,
- Provisions in our articles of incorporation and by-laws may limit the price that investors may be willing to pay in the future for shares of our common stock,
- Because we do not currently intend to pay dividends, shareholders will benefit from an investment in our common stock only if it appreciates in value

The foregoing and additional risk factors are described in more detail herein under Item 1A. “Risk Factors”. In addition, we operate in a highly competitive and rapidly changing environment and therefore, new risk factors can arise. It is not possible for management to predict all such risk factors, assess the impact of all such risk factors on our business nor estimate the extent to which any individual risk factor, or combination of risk factors, may cause results to differ materially from those contained in any forward-looking statement. The forward-looking statements included in this Annual Report on Form 10-K speak only as of the date of this Annual Report on Form 10-K. We do not assume any obligation to update or revise any forward-looking statements, whether as a result of new information, future events or developments, or otherwise, except as may be required by the securities laws. We caution you not to rely on them unduly.

Investors should also be aware that while II-VI Incorporated does communicate with securities analysts, from time to time, those communications are conducted in accordance with applicable securities laws. Investors should not assume that II-VI Incorporated agrees with any statement or report issued by any analyst irrespective of the content of the statement or report.

PART I

Item 1. BUSINESS

Introduction

II-VI Incorporated ("II-VI," the "Company," "we," "us," or "our") was incorporated in Pennsylvania in 1971. Our executive offices are located at 375 Saxonburg Boulevard, Saxonburg, Pennsylvania 16056. Our telephone number is 724-352-4455. Reference to "II-VI," the "Company," "we," "us," or "our" in this Annual Report on Form 10-K, unless the context requires otherwise, refers to II-VI Incorporated and its wholly-owned subsidiaries. The Company's name is pronounced "Two Six Incorporated." The majority of our revenues are attributable to the sale of engineered materials and optoelectronic components and devices for industrial laser applications, optical communications products, compound semiconductor substrate-based products and consumer products. Reference to "fiscal" or "fiscal year" means our fiscal year ended June 30 for the year referenced.

The Company's organizational structure is divided into three reporting segments for the purpose of making operational decisions and assessing financial performance: (i) II-VI Laser Solutions, (ii) II-VI Photonics, and (iii) II-VI Performance Products. These segments, and the units within the segments, are reflected in the organization chart below:

During the fiscal year ended June 30, 2016, the Company completed two acquisitions:

February 1, 2016EpiWorks, Inc. (“EpiWorks”)

March 15, 2016ANADIGICS, Inc. (“ANADIGICS”)

These two acquired businesses joined the II-VI Laser Solutions segment. See Note 2 to the Company’s Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for additional information regarding the Company’s acquisitions, which information is incorporated herein by reference.

On June 3, 2016, the Company sold the assets of ANADIGICS’s radio frequency (“RF”) business. In conjunction with the sale of the RF business, the Company renamed ANADIGICS as II-VI OptoElectronic Devices, Inc. (“OED”). See Note 2 to the Company’s consolidated financial statements included in Item 8 of this Annual Report on Form 10-K for additional information regarding the Company’s disposition of the RF business, which information is incorporated herein by reference.

Information Regarding Market Segments and Foreign Operations

Financial data regarding our revenues, results of operations, industry segments and international sales for the three years ended June 30, 2016 are set forth in the Consolidated Statements of Earnings and in Note 11 to the Company’s Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K and are incorporated herein by reference. We also discuss certain Risk Factors set forth in Item 1A of this Annual Report on Form 10-K related to our foreign operations, which are incorporated herein by reference.

General Description of Business

We develop and manufacture engineered materials, optoelectronic components and products for precision use in industrial, optical communications, military, semiconductor, consumer and life science applications. We use advanced engineered material growth technologies coupled with proprietary high-precision fabrication, micro-assembly, thin-film coating and electronic integration to enable complex optoelectronic devices and modules. Our products are deployed in applications that we believe reduce costs and improve performance and reliability in a variety of applications, including:

- Laser cutting, welding and marking operations,
- 3D sensing consumer applications,
- Optical communication products,
- Intelligence, surveillance and reconnaissance,
- Semiconductor processing and tooling, and
- Thermoelectric cooling and power generation solutions.

A key Company strategy is to develop and manufacture high performance materials that are differentiated from those produced by our competitors. We focus on providing components that are critical to the heart of our customers’ assembly lines for products serving the applications mentioned above.

Our U.S. production and research and development operations are located in Pennsylvania, California, New Jersey, Texas, Mississippi, Massachusetts, Connecticut, Delaware, New York, Florida and Illinois and our non-U.S. production operations are based in China, Singapore, Vietnam, the Philippines, Germany and Switzerland. We also utilize a contract manufacturer in Thailand. In addition to sales offices at most of our manufacturing sites, we have sales and marketing subsidiaries in Hong Kong, Japan, Germany, China, Switzerland, Belgium, the United Kingdom ("U.K."), Italy and South Korea. Approximately 63% of our revenues for the fiscal year ended June 30, 2016 were generated from sales to customers outside of the United States ("U.S.").

Our Markets and Products

Our market-focused businesses are organized by technology and products. Our businesses are composed of the following primary markets:

Our Markets:	Addressable Markets:	Fiscal Year 2016 Revenues by Market:
Industrial	Material processing - including laser cutting, welding, drilling, ablation, cladding, heat treating and marking. Chemical Vapor Deposition ("CVD") Diamond - windows, tooling, microwave and radiation detection. 3D sensing and printing applications.	$294 million
Optical Communications	Optical high-speed datacom applications and high power sensing for consumer electronic applications. Low-power polarization locked products for optical mouse and finger navigation applications. CATV networks and data centers. Metro to long haul and undersea networks.	$298 million
Military	Intelligence, surveillance, and reconnaissance.	$104 million
Other	Semiconductor, display and refractory components. Life science, medical and cosmetic devices. Cooling, heating and power generation. Consumer applications.	$131 million

The details of our Addressable Markets and our Key Products by Business Unit:

II-VI Laser Solutions Segment

II-VI Infrared Optics Group:

- Design, manufacture and marketing of engineered materials and optoelectronic components for industrial applications.

Increases in the installed worldwide base of carbon dioxide ("CO_2") and fiber laser machines for a variety of laser processing applications have driven CO_2 laser optics component consumption. It is estimated that there are over 75,000 CO_2 laser systems currently deployed in the world. CO_2 and fiber lasers offer benefits in a wide variety of cutting, welding, drilling, ablation, cladding, heat treating and marking applications for materials such as steel alloys, non-ferrous metals, plastics, wood, paper, fiberboard, ceramics and composites.

Laser systems enable manufacturers to reduce parts cost and improve quality, as well as improve process precision, speed, throughput, flexibility, repeatability and automation. Automobile manufacturers, for example, deploy lasers both to cut body components and to weld those parts together in high-throughput production lines. Manufacturers of motorcycles, lawn mowers and garden tractors cut, trim, and weld metal parts with lasers to reduce post-processing steps and, therefore, lower overall manufacturing costs. Furniture manufacturers utilize lasers because of their easily reconfigurable, low-cost prototyping and production capabilities for customer-specified designs. In high-speed food and pharmaceutical packaging lines, laser marking is used to provide automated product, date and lot coding on containers.

In addition to being installed by original equipment manufacturers ("OEMs") of laser systems in new machine builds, our optical components are purchased as replacement parts by end-users of laser machines to maintain proper system

performance.

In newer and developing market segments, Silicon Carbide (“SiC”) and CVD Diamond both exhibit very high thermal conductivities for use in high-end applications in the semiconductor and optoelectronic markets. CVD Diamond also has applications in the windows, tooling, microwave and radiation detection markets.

The key products enabling these applications in our addressable markets include precision infrared optoelectronic components such as lenses, output couplers, windows, mirrors and scan-lenses for use in CO_2 and fiber lasers. Our precision optoelectronic components are used to control laser energy, enhance the properties of the laser beam and focus and direct laser beams to a target work surface. The optoelectronic components include both reflective and transmissive optics and are made from materials such as zinc selenide, zinc sulfide, copper, silicon, gallium arsenide ("GaAs") and germanium. Transmissive optics used with CO_2 lasers are predominately made from zinc selenide. We believe we are the largest manufacturer of zinc selenide in the world.

II-VI HIGHYAG Division:

- Design, manufacture and marketing of customized technology for laser material processing to deliver both low-power and high-power one-micron laser light for industrial applications.

In many areas of material processing, laser technology has proven to be a better alternative to conventional production techniques. It has also enabled novel processing steps not previously achievable with legacy technologies. The precise cut and elegant seam are visible proof of a laser beam's machining efficiency.

Industrial applications such as welding, drilling and cutting have driven the recent market growth of one-micron laser systems, and are demanding increased performance, lower total cost of ownership, ease of use and portability of the one-micron laser systems. One-micron laser systems require efficient and reliable tools for the most demanding automotive and machine tool industries.

The key product enabling these applications include modular laser processing heads for fiber lasers, direct diode lasers and other one-micron laser systems. We also manufacture beam delivery systems including fiber optic cables and modular beam coupling systems.

II-VI OptoElectronic Materials & Devices Group:

II-VI Laser Enterprise Division:

- Design, manufacture and marketing of advanced semiconductor laser diodes and low-power polarization locked laser diodes.

We market advanced laser technology diodes for material processing, medical, cosmetic, 3-D sensing and printing applications and are exploring other new market opportunities for our high-power lasers.

In addition, we sell low-power polarization locked products for optical mouse and finger navigation applications. Our market opportunities for vertical cavity surface emitting laser ("VCSEL") products are expanding to include optical high-speed datacom applications and high-power sensing for consumer electronics applications.

II-VI OptoElectronic Devices Division:

- Design, manufacture and marketing of six-inch GaAs wafers.

Current markets include consumer electronics, WiFi, Internet of Things and automotive. The need for epitaxial semiconductor wafers is critical as devices require more power and storage capacity.

II-VI EpiWorks:

- Design, manufacture and marketing of epitaxial compound semiconductor wafers.

Epitaxial compound semiconductor wafers are driving performance in many differentiated markets including consumer electronics, laser projection, data centers, tailored heating and industrial marking. Our products are geared toward enabling higher performance photonic and RF components for consumer, communications, network and mobile applications and RF components for wireless handsets, tablets and the Internet of Things. We are a leading producer of advanced epitaxial wafers tailored for optimal performance in multiple next generation applications including LED and laser wafers used in displays and RF wafers used in smartphones.

II-VI Suwtech Division:

- Design, manufacture and marketing of high-power lasers for industrial applications and green lasers for consumer, life science and industrial applications. We supply high-power laser, green laser, narrow line-width laser and Q-switched laser solutions. Additionally, the division creates ultra-hard material laser cutting machines for industrial applications.

The need for high-power and green laser for industrial and medical applications continues to grow as does the need for a laser cutting device capable of processing the next generation of ultra-hard materials like diamond.

II-VI Photonics Segment

II-VI Photop Group:

- Our engineering resources are broadly based for design, manufacture and marketing of a diverse range of customized optics, including optical assemblies for consumer and commercial applications such as fiber optic communications, projection and display products, lasers, medical equipment and bio-medical instrumentation. Products include a wide variety of standard and custom laser gain materials, optics, optical components and optical module assemblies. Our laser gain materials are produced to stringent industry standards and precisely fabricated to customer specifications, and include neodymium-doped yttrium aluminum garnet ("Nd:YAG") and erbium-doped yttrium aluminum garnet ("Er:YAG") components for many types of laser systems.
- In addition, we design, manufacture and market crystal and optical components to major OEM customers for fiber, solid state and gas laser systems used in industrial and medical applications.
- The II-VI Photop market is driven by applications in the optical communications, medical and life science, and industrial markets. The optical communications market segment requires delivery of ever-increasing data bandwidth and necessitates innovations in performance and cost of the underlying optics and optical components.
- Medical and life science applications continue to gain traction in the market for laser procedures for aesthetic, vision correction, dental, ophthalmic, surgical and diagnostic lasers and instruments.
- Industrial market segments are addressed by solid state lasers and fiber lasers, which are used in high-power applications such as cutting, welding, drilling, and lower power applications such as marking and engraving. These industrial applications are demanding higher performance levels for less cost and more efficiency, creating competition for older technologies.
- II-VI Photop also addresses opportunities in the semiconductor processing, instrumentation, test and measurement and research market segments.

II-VI Optical Communications Group:

- Design, manufacture and marketing of optical components, assemblies, modules, transceivers and monitor products for use in communications, cable television ("CATV") networks and data centers.
- Design, manufacture and marketing of Erbium Doped Fiber Amplifiers ("EDFA") and their source 980 nanometer ("nm") pump laser diodes used to compensate for losses in optical fiber and other optical components and modules in optical transmission systems.
- Design, manufacture and marketing of Optical Time Domain Reflectometry ("OTDR") products for embedded monitoring of the physical line integrity in optical transmission systems.

The optical communications market is being driven in part by demand for high-bandwidth communication capabilities through increasing worldwide usage of the Internet and data services, the growing number of broadband users, mobile device and cloud computing users, and the greater reliance on high-bandwidth capabilities in our daily lives. High-bandwidth communication networks are being extended closer to the end-user with fiber-to-the-home and other fiber optic networks. Mobile data traffic also is increasing as smart phones continue to proliferate with increasingly sophisticated audio, photo, video, email and Internet capabilities, as well as data connection and storage through cloud computing networks. The resulting traffic, in turn, is felt throughout the network, including the core that depends on

optical technology. Our passive components, assemblies and modules are used for filtering, switching, combining and routing optical wavelengths within optical networks. Our monitoring products are used for measuring the performance of optical channels and systems.

Our 980 nm pump laser diodes are designed for use as high-power, highly reliable pump sources for EDFAs in terrestrial access, cross-connect, metro to long haul and undersea (submarine) repeater applications. Single mode high-power uncooled modules are designed for both the single channel and small form factor terrestrial market and also the stringent high reliability demands of the submarine (subsea) network market. In addition, we market EDFAs that are used to compensate for losses in optical fiber and other optical components and modules in optical transmission systems. We

offer optical amplifiers at all levels of functionality, from simple optical modules through full circuit cards, which plug directly into our customers' equipment racks and service the metro, regional and long-haul optical transmission markets. In some cases, we add additional switching and monitoring functionality to the base amplifier.

II-VI Performance Products Segment

II-VI Optical Systems:

- Design, manufacture and marketing of Ultra Violet ("UV"), Visible ("VIS") and Infrared ("IR") optical components and high-precision optical assemblies, laser gain material and micro-fine conductive mesh patterns for intelligence, surveillance, reconnaissance and other military, life science and commercial laser and imaging applications.

We provide several key assemblies and optical components such as windows, domes, laser rods and optics and related sub-assemblies to military, semiconductor, medical, and life sciences markets for UV, VIS, and IR applications in night vision, targeting, navigation, missile warning, and Homeland Security Intelligence, Surveillance and Reconnaissance systems.

Infrared windows and window assemblies for navigational and targeting systems are deployed on fixed and rotary-wing aircraft, such as the F-35 Joint Strike Fighter, F-16 fighter jet, Apache Attack Helicopter, unmanned platforms such as the Predator and Reaper Unmanned Aerial Vehicle ("UAV") and ground vehicles such as the Abrams M-1 Tank and Bradley Fighting Vehicle.

Additionally, multiple fighter jets, including the F-16, are equipped with large area sapphire windows, as a key component for the aircraft, providing advanced targeting and imaging systems. Our ability to grow large sapphire materials and manufacture these materials into large area sapphire windows has played a key role in our ability to provide an even larger suite of sapphire panels, which are a key component of the F-35 Joint Strike Fighter Electro Optical Targeting System.

Infrared domes are used on missiles with infrared guidance systems ranging from small, man-portable designs to larger designs mounted on helicopters, fixed-wing aircraft and ground vehicles. High-precision domes are an integral component of a missile's targeting system, providing efficient tactical capability, while serving as a protective cover to its internal components.

The Company also offers precision optical engineering and manufacturing, with particular efficiency in designing to customer end-item specifications, assisting with co-engineering designs, and designing for manufacturability. The high precision optical components and assemblies programs include Deep Impact Comet Flyby HRI & MRI, Lunar Reconnaissance Orbiter, Hellfire II Missile Optics, missile launch detection sensor optical assembly, and High Altitude Observatory telescopes among others. In addition to imaging, many of these systems employ laser designation and range-finding capabilities supported by our YAG material growth and competency in short wave infrared and visible optics. Turreted systems and mounted targeting pods employ these capabilities in addition to hand-held soldier systems. Rotary and fixed-wing platforms also use missile warning systems to protect against shoulder fired man-portable missiles. Our competencies in material growth for UV crystals and our optical assembly capabilities provide significant support to these missile warning systems. A key attribute to several of these systems is the ability to filter electro-magnetic interference using micro-fine conductive mesh patterns. This technology is also applied to non-optical applications for absorbing and transmitting energy from the surfaces of aircraft and missiles.

II-VI Marlow:

- Design, manufacture and marketing of Thermoelectric Modules ("TEMs") and assemblies for cooling, heating and power generation applications in the defense, telecommunications, medical, consumer and industrial markets.

TEMs are solid-state semiconductor devices that act as small heat pumps to cool, heat and temperature stabilize a wide range of materials, components and systems. Conversely, the principles underlying thermoelectrics allow TEMs to be used as a source of power when subjected to temperature differences. TEMs are more reliable than alternative cooling solutions that require moving parts and provide more precise temperature control solutions than competing technologies.

TEMs also have many other advantages which have spurred their adoption in a variety of industries and applications including defense and space applications that involve IR cooled and uncooled night vision technologies and thermal reference sources that are deployed in state-of-the-art weapons, as well as cooling high-powered lasers used for range-finding target designation by military personnel. TEMs also allow for temperature stabilization of telecommunication lasers that generate and amplify optical signals for fiber optics systems.

Thermoelectric-based solutions appear in a variety of medical applications including instrumentation and analytical applications such as DNA replication, blood analyzers and medical laser equipment.

The industrial, commercial and consumer markets provide a variety of niche applications ranging from desktop refrigerators and wine coolers to personal comfort technology, semiconductor processes and test equipment. In addition, power generation applications are expanding into fields such as waste heat recovery, heat scavenging and co-generation.

II-VI M Cubed:

- Design, manufacture and marketing of advanced ceramic materials and precision products for the semiconductor, display, industrial and defense markets.

Metal matrix composites ("MMC") and reaction bonded ceramics products are found in applications requiring precision, lightweight, strength, hardness and matched coefficient of thermal expansion. Each market has its own unique requirements and applications that drive material selection. This is especially true in semiconductor tool applications that require advanced materials to meet the need for increased tolerance, enhanced thermal stability, faster wafer transfer speeds, increased yields and reduced stage settling times.

The semiconductor markets employ SiC for wafer chucks, light-wave scanning stages and high temperature, corrosion resistant wafer support systems. Cooled SiC mirrors are used in the illumination systems of lithography tools.

The industrial market uses a variety of ceramic materials for applications requiring chemical inertness or high temperature tolerance such as in flat panel display manufacturing equipment, and refractory components.

The defense market uses MMCs for protective body armor as well as protection for ground, air and naval resources.

II-VI Advanced Materials:

- Design, manufacture and marketing of single crystal SiC substrates and polycrystalline CVD Diamond materials for use in the mobile communications, renewable energy, industrial, defense, semiconductor equipment and thermal management markets.

SiC is a wide bandgap semiconductor material that offers high-temperature, high-power and high-frequency capabilities as a substrate for applications at the high-performance end of the defense, telecommunication and industrial markets. SiC has a high number of intrinsic physical and electronic advantages over competing semiconductor materials such as silicon and GaAs. For example, the high thermal conductivity of SiC enables SiC-based devices to operate at high-power levels and still dissipate the excess heat generated. II-VI Advanced Materials supplies base SiC substrates into this market.

SiC-based structures are being developed and deployed for the manufacture of a wide variety of microwave and power switching devices. High-power, high-frequency SiC-based microwave devices are used in next generation wireless switching telecommunication applications and in both commercial and military radar applications.

SiC-based, high-power, high-speed devices improve the performance, efficiency and reliability of electrical power transmission and distribution systems ("smart grid"). They also provide power conditioning and switching in power supplies and motor controls in a wide variety of applications including aircraft, hybrid vehicles, industrial, communications and green energy applications.

Both SiC and CVD Diamond materials are being utilized in optical and electronic applications requiring high thermal conductivity for advanced thermal management. CVD Diamond also has applications in the semiconductor equipment, including: extreme ultraviolet ("EUV") lithography, windows, tooling, microwave and radiation detection markets.

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Our Strategy

Our strategy is to grow businesses with world-class engineered material capabilities to advance our current customers' strategies, penetrate new markets through innovative technologies and platforms, and enable new applications in large and growing markets.

A substantial portion of our business is based on sales orders with market leaders, which enable our forward planning and production efficiencies. We intend to continue capitalizing and executing on this proven model, participating effectively in the growth of the markets discussed above, and continuing our focus on operational excellence as we execute business strategies in the areas of:

Key Business Strategies:	Our Plan to Execute:
Identify New Products and Markets	Identify new technologies, products and markets to meet evolving customer requirements for high performance engineered materials through our dedicated corporate R&D program to increase new product revenue and maximize return on investment.
Balanced Approach to Research and Development	Internally and externally funded R&D expenditures, targeting an overall investment of between 7 and 9 percent of revenues. We are committed to accepting the right mix of internally and externally funded research that ties closely to our long-term strategic objectives.
Leverage Vertical Integration	Combine R&D and manufacturing expertise, operating with a bias to both components and production machines, reducing cost and lead time to enhance competitiveness, time to market, and profitability.
Investment in Low Cost Manufacturing	Strategically invest in, evaluate and identify opportunities to consolidate manufacturing operations worldwide to increase production capacity, capabilities and cost effectiveness.
Enhance Our Performance and Reputation as a Quality and Customer Service Leader	Continue to improve upon our established reputation as a consistent, high-quality supplier of engineered materials and optoelectrical components into our customers' products. Execute our global quality transformation process thereby eliminating costs of non-conforming materials and processes.
Identify and Complete Strategic Acquisitions and Alliances	Identify acquisition opportunities that accelerate our access to emerging high-growth segments of the markets we serve and further leverage our competencies and economies of scale.

Research, Development and Engineering

During the current fiscal year ended June 30, 2016, the Company continued to identify, invest in and focus our research and development on new products across the Company in an effort to accelerate our organic growth. This approach is managed under a disciplined innovation program that we refer to as the "II-VI Phase Gate Process".

Our research and development program includes internally and externally funded research and development expenditures targeting an overall annual investment of between 7 and 9 percent of product revenues. From time to time, the ratio of externally funded contract activity to internally funded contract activity varies due to the unevenness of government funded research programs and changes in the focus of our internally funded research programs. We are committed to having the right mix of internally and externally funded research that ties closely to our long-term strategic objectives. The Company continues to believe that externally funded research and development will decrease in the near term due to governmental budget constraints.

We devote significant resources to research, development and engineering programs directed at the continuous improvement of our existing products and processes and to the timely development of new technologies, materials and products. We believe that our research, development and engineering activities are essential to establish and maintain a leadership position in each of the markets we serve. As of June 30, 2016, we employed 892 people in research, development and engineering functions, 535 of who are engineers or scientists. In addition, certain manufacturing personnel support or participate in our research and development efforts on an ongoing basis. We believe this interaction between the development and manufacturing functions enhances the direction of our projects and design for manufacturing, reducing costs and accelerating technology transfers.

During the fiscal year ended June 30, 2016, we focused our research and development investments in the following areas:

Segment:	Area of Development:	Our Research and Development Investments:
II-VI Laser Solutions	High Power Laser Diodes and High Volume Components	Focusing on increasing fiber coupled optical output power of multi-emitter modules.
		Developing high power VCSELs for consumer devices and next generation high speed VCSELs for 3D sensing and datacom applications.
	CVD Diamond Technology	Developing CVD synthetic diamond for EUV applications.
		Focusing on broadening our portfolio beyond infrared windows applications.
II-VI Photonics	Photonics Design	Continuing to improve photonic crystal materials, precision optical parts, and laser device components.
	Pump Lasers	Investing in next generation GaAs pump chip and module for terrestrial and undersea performance.
		Developing indium phosphide growth and processing capability.
	Optical Amplifiers	Investing and broadening the range of semi-custom and custom amplifiers for Tier 1 customers.
	Optical Monitoring	Continuing optical channel monitor investment.
		Developing OTDR monitors to measure the health of outside fiber plant connections and connections within the central office.
	Micro-Optics Manufacturing	Shifting toward smaller, more compact platforms and packages.
		Investing in equipment manufacture substrates using computerized manufacturing processes.
II-VI Performance Products	Silicon Carbide Technology	Continuing SiC substrate technology efforts to advance 4G and 5G wireless.
		Producing as a leading supplier of 150mm SiC material and first supplier of 200mm SiC material.
	Thermoelectric Materials and Devices	Continuing to develop leading bismuth telluride ("Bi_2Te_3") for thermoelectric cooling/heating.
		Focusing on thermoelectric power generation capability in order to introduce new products to the market.
	Metal Matrix Composites and Reaction Bonded Ceramics	Supporting OEMs in new product development for measurement tools used in semiconductor fabrication.

The development of our products and manufacturing processes is largely based on proprietary technical know-how and expertise. We rely on a combination of contract provisions, trade secret laws, invention disclosures and patents to protect our proprietary rights. We have entered into selective intellectual property licensing agreements. When faced with potential infringement of our proprietary information, we have in the past and will continue to assert and vigorously protect our intellectual property rights.

Internally funded research and development expenditures were $60.4 million, $51.3 million and $42.5 million for the fiscal years ended June 30, 2016, 2015 and 2014, respectively. For these same periods, externally funded research and development expenditures were $8.7 million, $9.5 million and $3.5 million, respectively.

Marketing and Sales

We market our products through a direct sales force and through representatives and distributors around the world. Our market strategy is focused on understanding our customers' requirements and building market awareness and

acceptance of our products. New products are continually being produced and introduced to our new and established customers in all markets.

The Company has undertaken an initiative to centralize the worldwide marketing and sales functions across the Company's business units. Sales offices have been strategically established to best serve and distribute products to our worldwide customer base. There is significant cooperation, coordination and synergies among our business units that capitalize on the most efficient and appropriate marketing channels to address diverse applications within our markets.

Our sales forces develop effective communications with our OEM and end-user customers worldwide. Products are actively marketed through targeted mailings, telemarketing, select advertising and attendance at trade shows and customer partnerships. Our sales force includes a highly-trained team of application engineers to assist customers in designing, testing and qualifying our parts as key components of our customers' systems. As of June 30, 2016, we employed 262 individuals in sales, marketing and support.

We do business with a number of customers in the defense industry, who in turn generally contract with a governmental entity, typically a U.S. governmental agency. Most governmental programs are subject to funding approval and can be modified or terminated without warning by a legislative or administrative body. For further information regarding our exposure to government markets, see the discussion set forth in Item 1A – Risk Factors of this Annual Report on Form 10-K.

Manufacturing Technology and Processes

As noted in the "Our Strategy" section, many of the products we produce depend on our ability to manufacture and refine technically challenging materials and components. The ability to produce, process and refine these complex materials and to control their quality and yields is an expertise of the Company that is critical to the performance of our customers' instruments and systems. In the markets we serve, there are a limited number of suppliers of many of the components we manufacture and there are very few industry-standard products.

Our network of worldwide manufacturing sites allows us to manufacture our products in regions that provide cost-effective advantages and proximity to our customers. We employ numerous advanced manufacturing technologies and systems at our manufacturing facilities. These include automated Computer Numeric Control optical fabrication, high throughput thin-film coaters, micro-precision metrology and custom-engineered automated furnace controls for crystal growth processes. Manufacturing products for use across the electro-magnetic spectrum requires the capability to repeatedly produce products with high yields to atomic tolerances. We embody a technology and quality mindset that gives our customers the confidence to utilize our products on a just-in-time basis straight into the heart of their production lines.

Export and Import Compliance

We are required to comply with various export/import control and economic sanction laws, including:

- The International Traffic in Arms Regulations ("ITAR") administered by the U.S. Department of State, Directorate of Defense Trade Controls, which, among other things, impose licensing requirements on the export from the U.S. of certain defense articles and defense services, which generally include items that are specially designed or adapted for a military application and/or listed on the U.S. Munitions List;
- The Export Administration Regulations ("EAR") administered by the U.S. Department of Commerce, Bureau of Industry and Security, which, among other things, impose licensing requirements on the of certain dual-use goods, technology and software, which are items that potentially have both commercial and military applications;
- The regulations administered by the U.S. Department of Treasury, Office of Foreign Assets Control, which implement economic sanctions imposed against designated countries, governments and persons based on U.S. foreign policy and national security considerations; and
- The import regulations administered by the U.S. Customs and Border Protection.

Foreign governments have also implemented similar export and import control regulations, which may affect our operations or transactions subject to their jurisdiction. For additional discussions regarding our import and export compliance, see the discussion set forth in Item 1A – Risk Factors of this Annual Report Form on Form 10-K.

Sources of Supply

The major raw materials we use include zinc, selenium, zinc selenide, zinc sulfide, hydrogen selenide, hydrogen sulfide, tellurium, yttrium oxide, aluminum oxide, iridium, platinum, bismuth, silicon, thorium fluoride, antimony, carbon, gallium arsenide, copper, germanium, molybdenum, quartz, optical glass, diamond, and other materials. Excluding our own production, there are more than two external suppliers for all of the above materials except for zinc sulfide, hydrogen selenide and thorium fluoride, for which there is only one proven source of supply outside of the Company’s capabilities, and zinc selenide, for which there are no other proven external

sources of supply. For many materials, we have entered into purchase arrangements which provide discounts for annual volume purchases in excess of specified amounts.

The continued high-quality of and access to these materials is critical to the stability and predictability of our manufacturing yields. We test materials at the onset of the production process. Additional research and capital investment may be needed to better define future starting material specifications. We have not experienced significant production delays due to shortages of materials. However, we do occasionally experience problems associated with vendor-supplied materials not meeting contract specifications for quality or purity. As discussed in greater detail in Item 1A – Risk Factors, of this Annual Report on Form 10-K, significant failure of our suppliers to deliver sufficient quantities of necessary high-quality materials on a timely basis could have a materially adverse effect on our results of our operations.

Customers

The main groups of customers by segments are as follows:

Segment:	Group/Division:	Our Customers Are:	Representative Customers:
II-VI Laser Solutions	II-VI Infrared Optics Group	OEM and system integrators of industrial, medical and military laser systems.	·TRUMPF GmbH+Co.KG ·Bystronic Laser AG ·Rofin-Sinar Technologies, Inc.
		Laser end-users who require replacement optics for their existing laser systems.	·Caterpillar, Inc. ·Honda of America Mfg., Inc.
		Military, aerospace and commercial customers requiring products for use in advanced targeting, navigation and surveillance.	·Lockheed Martin Corporation ·Northrop Grumman Corporation.
	II-VI HIGHYAG Division	Automotive manufacturers, laser manufacturers and system integrators.	·Volkswagen AG ·Laserline GmbH
	II-VI Laser Enterprise Division, II-VI EpiWorks, & II-VI OptoElectronic Devices Division	Manufacturers of industrial laser components, optical communication equipment and consumer technology applications.	·Laserline GmbH ·Huawei Technologies, Co., Ltd. ·Cisco Systems, Inc. ·Samsung ·SkyWorks
II-VI Photonics	II-VI Photop Group & II-VI Optical Communications Group	Worldwide network system and sub-system providers of telecommunications, data communications and CATV. Global manufacturers of commercial and consumer products used in a wide array of instruments, fiber lasers, display and projection devices.	·Huawei Technologies, Co., Ltd. ·Cisco Systems, Inc. ·Ciena Corporation ·Corning Incorporated

II-VI Performance Products	II-VI Optical Systems	Manufacturers of equipment and devices for aerospace, defense, life science and commercial markets.	·Google, Inc. ·Lockheed Martin Corporation ·Raytheon Company ·BAE Systems ·Boeing Corporation ·Northrup Grumman Corporation
	II-VI Marlow	Manufacturers and developers of equipment and devices for defense, space, telecommunications, medical, industrial, automotive, personal comfort and commercial markets.	·Bio-Rad Laboratories, Inc. ·Raytheon Company ·Flextronics International Ltd.
	II-VI M Cubed	Manufacturers and developers of integrated circuit capital equipment for the semiconductor industry.	·ASML Holding NV ·Nikon Corporation ·KLA-Tencor
		Manufacturers and developers of products and components for various defense and industrial markets.	·BAE Systems ·Corning Incorporated ·TenCate
	II-VI Advanced Materials	Manufacturers and developers of equipment and devices for high-power RF electronics and high-power and voltage switching and power conversion systems for both commercial and military applications. Manufacturers of high-power optical and electronic devices requiring advanced thermal management solutions.	·IQE plc ·Infineon Technologies ·Sumitomo Electric Device Innovations, Inc.

Competition

We believe we are a global leader in many of our product families. We compete on the basis of the highly engineered nature of our products, quality, delivery time, technical support and pricing. We believe that we compete favorably with respect to these factors and that our vertical integration, manufacturing facilities and equipment, experienced technical and manufacturing employees and worldwide marketing and distribution channels provide us with competitive advantages. The main groups of our competitors are as follows:

Segment:	Areas of Competition:	Competitors:
II-VI Laser Solutions	Infrared laser optics	·Sumitomo Electric Industries, Ltd. ·Newport Corporation
	Automated equipment and laser material processing tools to deliver high-power one-micron laser systems	·Optoskand AB ·Precitece GmbH
	Semiconductor laser diodes for the industrial and consumer markets	·Lumentum Operations LLC ·Finisar Corporation ·Avago Technologies ·Sumitomo Electric Industries, Ltd. ·Koninklijke Philips N.V ·Jenoptik AG ·Osram Licht AG
II-VI Photonics	Optical component and optics products for telecom	·O-Net Communications Group Ltd. ·OPLINK Communication, LLC ·Axsun ·Casix, Inc. (Fabrinet)
	Optical amplifier modules	·Lumentum Operations LLC ·Finisar Corporation ·Accelink ·O-Net Communications Group, Ltd.
	Optical and crystal components and sub-assemblies for lasers and test instruments	·Casix, Inc. (Fabrinet) ·Castech

		·REO
II-VI Performance Products	Infrared optics for military applications	·Laser Components ·DRS Technologies, Inc. ·UTC Aerospace Systems (formerly Goodrich Corporation) ·In-house fabrication and thin-film coating capabilities of major military customers
	TEMs	·Komatsu, Ltd. ·Laird plc ·Ferrotec Corporation
	MMCs and reaction bonded ceramics products	·Berliner Glas ·CoorsTek, Inc. ·Japan Fine Ceramics Co. Ltd.
	Single crystal SiC substrates	·Cree, Inc. ·Dow Corning Corporation ·Nippon Steel & Sumitomo Metal ·SiCrystal AG

In addition to competitors who manufacture products similar to those we produce, there are other technologies and products available that may compete with our technologies and products.

Bookings and Backlog

We define our bookings as customer orders received that are expected to be converted to revenues over the next twelve months. For long-term customer orders, to address the inherent uncertainty of orders that extend far into the future, the Company records only those orders which are expected to be converted into revenues within twelve months from the end of the reporting period. Bookings are adjusted if changes in customer demands or production schedules move a delivery beyond twelve months. For the year ended June 30, 2016, our bookings were approximately $875 million compared to bookings of approximately $762 million for the year ended June 30, 2015.

We define our backlog as bookings that have not been converted to revenues by the end of the reporting period. As of June 30, 2016, our backlog was approximately $290 million, compared to approximately $242 million at June 30, 2015.

Employees

As of June 30, 2016, we employed approximately 8,927 persons worldwide. Of these employees, approximately 892 were engaged in research, development and engineering, approximately 7,131 in direct production (of which approximately 858 are employees of Photop in China who work under contract manufacturing arrangements for customers of the Company) and the remaining balance of the Company's employees work in sales and marketing, administration, finance and support services. Our production staff includes highly skilled optical craftsmen. We have a long-standing practice of encouraging active employee participation in areas of operations management. We believe our relations with our employees are good. We reward our employees with incentive compensation based on achievement of performance goals. There are approximately 124 employees located in the United States and the Philippines who are covered under collective bargaining agreements. The Company's collective bargaining agreement in the Philippines expired in June 2016 and we are in the ordinary course of re-negotiating this agreement. The collective bargaining agreement covering certain U.S. based employees expires in January of 2021.

Trade Secrets, Patents and Trademarks

We rely on a combination of trade secrets, proprietary know-how, invention disclosures, patents and contractual provisions to help us develop and maintain our competitive position with respect to our products and manufacturing processes. We aggressively pursue process and product patents in certain areas of our businesses. We have entered into selective intellectual property licensing agreements. When faced with potential infringement of our proprietary information, we have in the past and will continue to assert and vigorously protect our intellectual property rights. We have confidentiality and noncompetition agreements with certain personnel. We require that all U.S. employees sign a confidentiality and noncompetition agreement upon their commencement of employment with us.

The processes and specialized equipment utilized in crystal growth, infrared materials fabrication and infrared optical coatings as developed by us are complex and difficult to duplicate. However, there can be no assurance that others will not develop or patent similar technology or that all aspects of our proprietary technology will be protected. Others have obtained patents covering a variety of infrared optical configurations and processes, and others could obtain patents covering technology similar to our technology. We may be required to obtain licenses under such patents, and there can be no assurance that we would be able to obtain such licenses, if required, on commercially reasonable terms, or that claims regarding rights to technology will not be asserted which may adversely affect our results of operations. In addition, our research and development contracts with agencies of the U.S. Government present a risk that project-specific technology could be disclosed to competitors as contract reporting requirements are fulfilled.

Availability of Information

Our Internet address is www.ii-vi.com. Information contained on our website is not part of, and should not be construed as being incorporated by reference into, this Annual Report on Form 10-K. We post the following reports on our website as soon as reasonably practical after they are electronically filed with or furnished to the Securities and Exchange Commission (the “SEC”): our Annual Reports on Form 10-K, our Quarterly Reports on Form 10-Q, our Current Reports on Form 8-K, and any amendments to those reports or statements filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act. In addition, we post our proxy statements on Schedule 14A related to our annual shareholders’ meetings as well as reports filed by our directors, officers and ten-percent beneficial owners pursuant to Section 16 of the Exchange Act. In addition, all filings are available via the SEC’s website (www.sec.gov). We also make our corporate governance documents available on our website, including the Company’s Code of Business Conduct and Ethics, governance guidelines and the charters for various board committees. All such documents are located on the Investors page of our website and are available free of charge.

Item 1A. RISK FACTORS

We caution our investors that our performance is subject to risks and uncertainties. The following material risk factors may cause our future results to differ materially from those projected in any forward-looking statement. You should carefully consider these factors, as well as the other information contained in this Annual Report on Form 10-K when evaluating an investment in our securities.

Our Future Success Depends on Continued International Sales

Sales to customers in countries other than the U.S. accounted for approximately 63%, 63% and 65% of revenues during the years ended June 30, 2016, 2015 and 2014, respectively. We anticipate that international sales will continue to account for a significant portion of our revenues for the foreseeable future. If we do not realize such international sales or if our international sales decrease substantially, we could suffer a material adverse effect on our business, results of operations and/or financial condition.

Our Competitive Position Depends on Our Ability to Develop New Products and Processes

To meet our strategic objectives, we must develop, manufacture and market new products and continue to update our existing products and processes to keep pace with market developments to address increasingly sophisticated customer requirements. Our success in developing and selling new and enhanced products and processes depends upon a variety of factors including strategic product selection, efficient completion of product design and development, timely implementation of manufacturing and assembly processes, effective sales and marketing, and successful product performance in the market.

The introduction by our competitors of products or processes using new developments better or faster than ours could render our efforts underway obsolete or unmarketable. We intend to continue to make significant investments in research and development to achieve our goals. There can be no assurance that we will be able to develop and introduce new products or enhancements to our existing products and processes in a manner which satisfies customer needs or achieves market acceptance. The failure to do so could have a material adverse effect on our ability to grow our business and maintain our competitive position.

Investments in Future Markets of Potential Significant Growth May Not Result in Expected Returns

We previously announced an investment program with the goal of gaining a greater share of end markets using semiconductor lasers, especially those used for 3D sensing. We cannot guarantee that our investments in capital and capabilities will be sufficient. The potential market may not materialize on the timeline anticipated or at all. We cannot be sure of the end market price. Our technology could fail to fulfill, completely or at all, our target customers' finalized specifications. We cannot guarantee the end market customers' acceptance of our technology. Further, we may be unable to fulfill the terms of our contracts with our target customers, which could result in penalties of a material nature, including consequential damages, loss of market share and loss of reputation.

We May Fail to Accurately Estimate Our Customers' Demand

We make significant decisions based on our estimates of customer requirements. We use our estimates to determine the levels of business we seek and accept, production schedules, personnel needs and other resource requirements.

Customers may require rapid increases in production on short notice. We may not be able to purchase sufficient supplies or allocate sufficient manufacturing capacity to meet such increases in demand. Rapid customer ramp up and significant increases in demand may strain our resources or negatively affect our margins. Inability to satisfy customer demand in a timely manner may harm our reputation, reduce our other opportunities, damage our

relationships with customers, reduce revenue growth, and/or incur contractual penalties.

Alternatively, downturns in the industries in which we compete may cause our customers to significantly reduce their demand. With respect to orders we initiate with our suppliers prior to a downturn to address our customer's demand, certain suppliers may have required non-cancelable purchase commitments or advance payments, from us, and those obligations and commitments could reduce our ability to adjust our inventory or expense levels to declining market demands. Unexpected decline in customer demands can result in excess or obsolete inventory and result in additional charges. Because certain of our sales, research and development and internal manufacturing overhead expenses are relatively fixed, a reduction in customer demand may decrease our gross margins and operating income.

Global Economic Downturns May Adversely Affect Our Business, Operating Results and Financial Condition

Current and future conditions in the global economy have an inherent degree of uncertainty. As a result, it is difficult to estimate the level of growth or contraction for the global economy as a whole. It is even more difficult to estimate growth or contraction in various parts, sectors and regions of the economy, including industrial, military, optical communications, telecommunications, semiconductor, and medical and life science markets in which we participate. All aspects of our company forecast depend on estimates of growth or

contraction in the markets we serve. Thus, prevailing global economic uncertainties render estimates of future income and expenditures very difficult to make.

Global economic downturns may affect industries in which our customers operate. These changes could include decreases in the rate of consumption or use of our customers' products. Such conditions could have a material adverse effect on demand for our customers' products, and in turn, on demand for our products.

Adverse changes may occur in the future as a result of declining or flat global or regional economic conditions, fluctuations in currency and commodity prices, wavering confidence, capital expenditure reductions, unemployment, decline in stock markets, contraction of credit availability or other factors affecting economic conditions. For example, factors that may affect our operating results include disruption in the credit and financial markets in the U.S., Europe and elsewhere, adverse effects of ongoing stagnation in the European economy, slowdown in the Chinese economy, reductions or limited growth in consumer spending or consumer credit, and other adverse economic conditions that may be specific to the Internet, e-commerce and payments industries.

These changes may negatively affect sales of products and increase exposure to losses from bad debt and commodity prices, the cost and availability of financing, and costs associated with manufacturing and distributing products. Any economic downturn could have a material adverse effect on our business, results of operations or financial condition.

Our Global Operations are Complex to Manage

We manufacture products in the United States, China, Singapore, Vietnam, the Philippines, Germany, and Switzerland, and through contract manufacturers in Thailand and China. We also maintain direct sales offices in Hong Kong, Japan, Germany, Switzerland, the U.K., Belgium, China, Singapore, Italy and South Korea. Our operations vary by location, are influenced by local customs, languages and work practices as well as different weather conditions, management styles, differences in education from country to country and the inability of management to always act in a timely manner. In addition, different issues may arise in different countries at the same time, further hampering the management's ability to respond. Inability to respond to issues in our global operations could have a material adverse effect on our business, results of operations or financial condition.

We Have Entered into Supply Agreements which Commit Us to Supply Products on Specified Terms

We have supply agreements with some customers which require us to supply products and to allocate sufficient capacity to make these products. We have also agreed to pricing schedules and methodologies which could result in penalties if we fail to meet development, supply and quality commitments. Failure to do so may cause us to be unable to generate the amount of revenue or the level of profitability we expect from these arrangements. Our ability to realize a profit under some of these agreements will be subject to the level of customer demand, the cost of maintaining facilities and manufacturing capacity, and supply chain capability.

If we fail to fulfill our commitments under these supply agreements our business, after using all remedies available, financial conditions and results of operations may suffer a material adverse effect.

We Depend on Highly Complex Manufacturing Processes That Require Products from Limited Sources of Supply

Our operations are dependent upon a supply chain of difficult-to-make or difficult-to-refine products and materials. Some of our product inflow is subject to yield from growth or fabrication operations, and thus the quantities we may receive are not consistently predictable. Customers may also change the specification for a product that our suppliers cannot meet.

We also make products for which the Company is one of the world's largest suppliers. We use high-quality, optical grade zinc selenide (ZnSe) in the production of many of our IR optical products. We are the leading producer of ZnSe for our internal use and for external sale. The production of ZnSe is a complex process requiring a highly controlled environment. A number of factors, including defective or contaminated materials, could adversely affect our ability to achieve acceptable manufacturing yields of high quality ZnSe. No proven external sources of ZnSe are currently available. Lack of adequate availability of high quality ZnSe could have a material adverse effect upon our business. There can be no assurance that we will not experience manufacturing yield inefficiencies which could have a material adverse effect on our business, results of operations or financial condition.

We produce Hydrogen Selenide gas which is used in our production of ZnSe. There are risks inherent in the production and handling of such material. Our lack of proper handling of Hydrogen Selenide could require us to curtail our production of Hydrogen Selenide. Hydrogen Selenide is available from only one outside source whose quantities and quality may be limited. The cost of purchasing such material is greater than the cost of internal production. As a result, the purchase of a substantial portion of such material from the outside source would increase our ZnSe production costs. Our potential inability to internally produce Hydrogen Selenide could have a material adverse effect on our business, results of operations or financial condition.

In addition, we produce and use other high purity and relatively uncommon materials and compounds to manufacture our products including, but not limited to, Zinc Sulfide (ZnS), Gallium Arsenide (GaAs), Yttrium Aluminum Garnet (YAG), Yttrium Lithium Fluoride (YLF), Calci