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EMAGIN CORP

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UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
Form 10-K

☒ **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**

For the transition period from to

Commission file number **001-15751**

eMAGIN CORPORATION

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of
incorporation or organization)

56-1764501

(I.R.S. Employer
Identification No.)

700 South Drive, Suite 201, Hopewell Junction, NY 12533

(Address of principal executive offices)

(845) 838-7900

(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, \$.001 Par Value Per Share	EMAN	NYSE American

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark whether the registrant is a well-known seasoned issuer as defined in Rule 405 of the Securities Act. Yes ☐ No ☒

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. 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 every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 229.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

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

Large accelerated filer ☐
Accelerated filer ☐
Non-accelerated filer ☒

Smaller Reporting Company ☒
Emerging growth company ☐

If an emerging growth company, 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 13(a) of the Exchange Act. ☐

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

As of June 30, 2019, the last business day of the registrant's most recently completed second quarter, the aggregate market value of the issued and outstanding common stock held by non-affiliates of the registrant, based upon the closing price of the common stock as traded on the NYSE American of \$1.80 was approximately \$54.0 million. For purposes of the above statement only, all directors, executive officers, and 10% shareholders are assumed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for any other purpose.

The number of shares of common stock outstanding as of March 3, 2020 was 51,300,677.

DOCUMENTS INCORPORATED BY REFERENCE

The information required by Part III of this Report, to the extent not set forth herein, is incorporated herein by reference from the registrant's definitive proxy statement relating to the Annual Meeting of Stockholders to be held in 2020, which definitive proxy statement shall be filed with the Securities and Exchange Commission within 120 days after the end of the fiscal year to which this Report relates.

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This Annual Report on Form 10-K, or Report, contains forward-looking statements that are based on our management's belief and assumptions and on information currently available to our management. Although we believe that the expectations reflected in these forward-looking statements are reasonable, these statements relate to future events or our future financial performance, and involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from any future results, levels of activity, performance or achievements expressed or implied by these forward-looking statements.

In some cases, you can identify forward-looking statements by terminology such as "may," "will," "should," "expects," "intends," "plans," "anticipates," "believes," "estimates," "predicts," "potential," "continue" or the negative of these terms or other comparable terminology. These statements are only predictions. You should not place undue reliance on forward-looking statements because they involve known and unknown risks, uncertainties and other factors, which are, in some cases, beyond our control and which could materially affect our results. Factors that may cause actual results to differ materially from current expectations include, among other things, those listed in the section entitled "Risk Factors" and elsewhere in this Report. If one or more of these risks or uncertainties occur, or if our underlying assumptions prove to be incorrect, actual events or results may vary significantly from those implied or projected by the forward-looking statements. No forward-looking statement is a guarantee of future performance. You should read this Report and the documents that we reference in this Report and have filed with the Securities and Exchange Commission, or the SEC, as exhibits to this Report, completely and with the understanding that our actual future results may be materially different from any future results expressed or implied by these forward-looking statements.

In particular, forward-looking statements in this Report include statements about:

- our ability to generate sufficient cash flows and obtain the additional financing we need in order to continue as a going concern;
- our ability to generate additional revenue or secure additional external financing when, or if, required, in order to continue our current operations;
- our ability to manufacture our products on a timely basis and at a competitive cost;
- our ability to successfully remediate manufacturing issues that have resulted in production delays and successfully integrate new equipment on our manufacturing line;
- our ability to achieve our yield improvement initiatives;
- our ability to meet our obligations as they become due over the next twelve months;
- our needs for additional financing, as well as our ability to obtain such additional financing on reasonable terms and the interest rate and expense we incur on any debt financing;
- our anticipated cash needs and our estimates regarding our capital requirements;
- our ability to maintain our relationships with customers and vendors;
- our ability to protect our intellectual property;
- our ability to successfully develop and market our products to customers;
- our ability to generate customer demand for our products in our target markets;
- the development of our target markets and market opportunities, including the consumer market;
- technological developments in our target markets and the development of alternate, competing technologies in them;
- the rate of acceptance of AR/VR systems and products in the consumer and commercial marketplace;
- our potential exposure to product liability claims;
- our ability to meet customers' delivery schedules;
- market pricing for our products and for competing products;
- the concentration of a significant ownership percentage in our Company in a relatively small number of stockholders and the ability of one or more of such stockholders to exert substantial control over our affairs;
- changes in demand by OEM customers for advanced microdisplays, limited availability of suppliers and foundries, high costs of raw materials, pricing pressure brought by the marketplace or governmental customers and other factors that impact the commercial, military and consumer markets in which we operate;
- increasing competition;
- provisions in certain of our organizational documents, commercial agreements and our military contracts that may prevent or delay an acquisition of, partnership with, or investment in, our Company and our ability to develop original equipment manufacturer and mass production partnerships; and
- our efforts to settle purchase commitments remaining from our consumer night vision business.

The forward-looking statements in this Report represent our views as of the date of this Report. We anticipate that subsequent events and developments may cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we have no current intention of doing so except to the extent required by applicable law. Therefore, these forward-looking statements do not represent our views as of any date other than the date of this Report.

In this Report, references to "eMagin Corporation," "eMagin," "the Company," "we," "us," and "our company" refer to eMagin Corporation and our wholly owned subsidiary, Virtual Vision, Inc. References to "Consumer Night Vision Business" refers to our consumer night vision products business.

eMagin® is a registered trademark of eMagin Corporation. dPd™ is an unregistered trademark of eMagin. All rights reserved. All other trademarks used in this Annual Report are the property of their respective owners.

ITEM 1. BUSINESS**Introduction**

We design, develop, manufacture and market organic light emitting diode, or OLED miniature displays, which we refer to as OLED-on-silicon microdisplays, virtual imaging products that utilize OLED microdisplays, and related products. We also perform research in the OLED field. Our virtual imaging products integrate OLED technology with silicon chips to produce high-resolution microdisplays which, when viewed through a magnifying headset, create virtual images that appear comparable in size to that of a computer monitor or a large-screen television. Our products enable our original equipment manufacturer, or OEM, customers in the military and commercial markets to develop and market improved or new electronic products.

We believe that our OLED microdisplays offer a number of significant advantages over comparable liquid crystal microdisplays, including higher contrast, greater power efficiency, less weight, more compact size, and negligible image smearing. Using our active matrix OLED technology, many computer and electronic system functions can be built directly into the OLED microdisplay silicon backplane, resulting in compact, high resolution and power efficient systems. Already proven in military and commercial systems, our product portfolio of OLED microdisplays deliver high-resolution, virtual images that perform effectively even in extreme temperatures and high-vibration conditions.

Our OEM customers incorporate our OLED displays in a variety of products including, military aviation helmets, military weapons sights and targeting systems, night vision and thermal imaging devices, training and simulation, visualization for ocular surgery, mobile ultrasound, and augmented reality applications.

We believe our technology, intellectual property portfolio and position in the marketplace give us a leadership position in OLED and OLED-on-silicon microdisplay technology. We have an intellectual property portfolio that includes 35 U.S. patents and 18 pending U.S. patent applications (one of which have received a Notice of Allowance), and have over 20 years of manufacturing know-how and other proprietary technologies to create our high performance OLED microdisplays. We also have 3 issued foreign patents and 21 foreign filings. We believe that we are one of only a few companies to market and produce significant quantities of high resolution, small molecule OLED-on-silicon microdisplays.

We also believe that our direct patterning ("dPd") technology, which we introduced during 2018, gives us an advantage over other OLED microdisplays because it allows us to produce microdisplays with the high brightness required for VR and AR and certain military applications. Traditional OLED microdisplays utilize white emitting OLED with color filters that lessen the intensity of emitted light by as much as 80%, significantly reducing brightness. Microdisplays manufactured by dPd technology do not require color filters to achieve color variations and allow for the application of more efficient OLED structures which achieve higher brightness. dPd also allows for much lower power and longer life when run at the same luminance of a color filter display.

We derive the majority of our revenue from sales of our OLED microdisplay products. We also earn revenue from commercial, consumer product and government development contracts that may complement and support our internal research and development programs. In addition, we generate sales from optics and microdisplays combined with optics.

We were formed in March 2000, through the merger of Fashion Dynamics Corporation, and FED Corporation, a developer and manufacturer of optical systems and microdisplays for use in the electronics industry. Simultaneous with this merger, we changed our name to eMagin Corporation. We are incorporated in the state of Delaware.

Our common stock is traded on the NYSE: American under the symbol EMAN.

Our Industry

A microdisplay generally has a screen size that is less than two inches in diagonal. The miniature size enables microdisplays to be used in a wide variety of applications that require a screen that takes up small space, such as head-mounted displays or HMDs, weapon sights, and viewfinders of digital cameras. Microdisplays are used across various industries, including the military, commercial, and consumer markets in which we operate. Microdisplays provide many advantages over other displays where small size is a requirement. Benefits include compact size, high brightness and resolution, low power consumption, and high contrast.

Our Technology Platform

Our microdisplays are based upon active matrix small molecule OLED technology, which we refer to as active matrix OLED or AMOLED. Our AMOLED technology permits us to build millions of individual low-voltage light sources on low-cost, silicon computer chips to produce single color, white or full-color display arrays. Our technology allows many computer and video electronic system functions to be built directly into the silicon chip, under the OLED film, resulting in a compact, integrated system with lower overall system costs relative to alternative technologies.

OLEDs are thin films of stable organic materials that emit light of various colors when a voltage is applied to them. OLEDs are emissive devices, which mean that they create their own light, as opposed to liquid crystal displays, which require a separate light source. As a result, our OLED microdisplays use less power and deliver much higher contrast and fuller color than liquid crystal microdisplays. Unlike liquid crystal displays which use crossed polarizers to generate black level, OLED displays exhibit an extremely high contrast ratio which results in very vivid images. Because the light they emit is lambertian, which means that it appears equally bright from most forward directions, a moderate movement in the eye does not change the image brightness or color as it does in other technologies.

Our technology is based on integrating a proprietary OLED device with a specially designed silicon backplane to produce efficient and high performance AMOLED microdisplays. Our OLED displays incorporate a proprietary, top-emitting structure for our OLED devices that enables OLED displays to be built on opaque silicon integrated circuits rather than only on glass. Our OLED microdisplays emit full visible spectrum (white) light that is isolated with color filters to create color images. Our microdisplays' performance meets or exceeds the requirements for a typical notebook computer or cell phone and is useful for a myriad of applications. New processes and device improvements, such as our OLED-XLS and OLED-XLE technologies, offer even better performance including brightness and efficiency.

We have developed extremely bright OLED microdisplays using our patented dPd technology and have demonstrated color high resolution 2K x 2K and widescreen ultra extended graphics array, or WUXGA, microdisplays with brightness in excess of 7,500 nits, which we believe is the world's highest resolution and brightness. In addition to our AMOLED technology, we have developed compact optic and lens enhancements, which when coupled with the microdisplay, help our OEM customers provide a high quality large screen appearance.

We believe that our AMOLED technology provides significant advantages over other microdisplay technologies in our targeted markets. These key advantages include:

- High brightness;
- Sharp contrast;
- Vivid colors;
- Low power consumption for improved battery life and longer system life;
- High-speed performance resulting in clear video images;
- Compact form factor and light weight;
- Wide operating temperature range;
- Good environmental stability (vibration and humidity); and
- Anticipated low manufacturing cost at higher volumes.

Our Market Opportunities

We target the military, commercial (in which we include the medical and industrial sectors), and consumer markets with many of our products catering to multiple markets. Within each of these market sectors we believe that our OLED microdisplays, when combined with compact optic lenses, can become a key component for a variety of mobile electronic products.

Military

We believe that head-mounted systems incorporating our high brightness OLED microdisplays increase the user's effectiveness by allowing hands-free operation and increased situational awareness with sufficient brightness for use in daylight, yet controllable for nighttime light security. As a COTS (commercial off-the-shelf) component, OLED microdisplays possess performance characteristics important to demanding military and commercial (e.g., industrial) applications, including high contrast, wide dimming range, shock and vibration resistance, and insensitivity to high G-forces. The design features and performance characteristics of our OLED microdisplays reduce the size, weight, and power required by current and future military systems, while also providing a wide operating temperature range. The image does not flicker or have color breakup in vibrating environments and the microdisplay's wide viewing angle allows ease of viewing for long periods. Most important, our OLED's low power consumption reduces battery weight and, for military applications, reduces constraints on mission length due to battery life. The OLED's wide operating temperature range is of special interest for military applications because the display can turn on instantly at temperatures far below freezing and can operate at high temperatures such as in desert conditions. We believe that our microdisplay products provide power advantages over other microdisplay technologies, particularly liquid crystal displays which require backlights and heaters and cannot provide instant-on capabilities at low

temperatures. Incorporating OLED microdisplays into aviation helmets has been made possible in part by the high brightness, high contrast and other performance features of the OLED technology that we have developed.

Our products' military applications primarily fall into three broad areas: (1) helmet -mounted and handheld displays for situational awareness and data; (2) night vision/thermal imaging goggles, weapons sights, and handheld viewers; and (3) training and simulation devices. These systems are also well suited for demanding operations including; homeland defense, fire and rescue and urban security.

Situational Awareness. Our OLED microdisplays have been incorporated into a broad range of U.S. and foreign military situational awareness programs. Situational awareness products include head-mounted displays that are used to display images, including digital map, sensor imagery and pilot aviation information. In addition, handheld imagers provide improved situational awareness on the battlefield, as well as in training and simulation. These products can also be combined with a weapon system to give the user the capability to select targets without direct exposure. During 2019, we delivered initial displays under a program with Collins Aerospace to support the F-35 Lightning II helmet mounted display systems. These custom designed displays are a key component in providing superior contrast with no "green glow" inherent in the previous display. We will continue to deliver displays throughout 2020 while working closely with Collins Aerospace to further improve the display in preparation for Limited Rate Initial Production, or LRIP.

Night Vision/Thermal Imaging. Night vision goggles allow the user to see in low light conditions. Most versions include two different technologies: infrared/thermal and image intensification. Third and fourth generation military devices generally use some combination of the two technologies. Thermal imagers detect infrared energy (heat) and convert it into an electronic signal. The resulting signal needs to be presented on a display. Heat sensed by an infrared camera can be very precisely quantified, or measured, allowing the user to not only monitor thermal performance, but also identify and evaluate the relative severity of heat-related problems. Thermal imaging systems can be stand-alone handheld systems or integrated as part of the aiming mechanism for a larger system. Advances in sensor technology, both in sensitivity and resolution as well as economic efficiency, have been the driving factors in the adoption of thermal technologies for military applications. We believe the power efficiency and environmental ruggedness of our products are strong competitive advantages, particularly for smaller handheld non-cooled systems. Fielded products incorporating our OLED microdisplays include Enhanced Night Vision Goggle II, the Enhanced Night Vision Goggle III, the Enhanced Night Vision Binocular, Javelin CLU medium-range anti-tank missile system, Laser Targeting Locator Modules, handheld and clip on thermal imagers.

Training and Simulation. Our OLED microdisplays are purchased by OEMs for use with their simulation and training products. Our displays have been commercialized and prototyped for situational awareness and night vision/thermal imaging applications by military systems integrators.

Commercial

We believe that a wide variety of commercial, markets (in which we include the medical and industrial sectors) offer significant opportunities for our products due to increasing demand for instant data accessibility in mobile workplace environments and the benefit of mobile displays to enhance visual performance. This market also includes night and thermal imaging systems for law enforcement and first responders. Examples of existing and potential microdisplay applications include enhanced visualization for ocular surgery, mobile ultrasound, mobile nondestructive testing, enhanced vision for those with visual impairments, immediate access to inventory records or maintenance and construction manuals, routine quality assurance inspection, and real-time viewing of images, and data for a variety of applications. As an example, a user wearing an HMD while operating test equipment, such as an oscilloscope, can view technical data while simultaneously probing printed circuit boards. Current commercial products equipped with our OLED microdisplays in these sectors include those produced by Alcon, Abbott Laboratories, IMV (formerly BCF), Liteye, Trijicon, FLIR Systems, Nordic NeuroLab, and VRmagic.

Consumer

We believe a major driver of the longer term near -eye virtual imaging microdisplay market is the growing consumer demand for mobile access to larger volumes of information and entertainment in smaller and more affordable packages. This desire for mobility has resulted in the development of mobile video personal viewer products in three general categories:

- immersive VR headset-application platforms such as accessories for gaming computers, and wearable telepresence systems;
- augmented reality glasses and personal viewers for cell phones; and
- low cost thermal and low light imaging incorporated in scopes for hunting and other outdoor activities.

When we are able to manufacture our OLED displays in higher volumes at reduced costs and capitalize on our dPd technology, we believe that our products will be increasingly well positioned to compete with other microdisplays and cell phone size displays in the rapidly growing consumer market, particularly as demand expands for sophisticated mobile personal viewers offering higher resolution and better image quality for VR and AR applications. Users of VR HMDs are demanding a fully immersive experience. We believe our dPd technology addresses the critical performance parameters for next generation VR HMDs, including higher brightness, sharper resolution, lower power consumption, elimination of motion artifacts, and longer life. Our strategy for addressing the consumer mass

Potential applications for these personal viewers include handheld personal computers and mobile devices, such as smartphones, whose small, direct view screens limit the amount of information that can be displayed but which are now capable of running more complex software applications. Examples encompass applications where hands-free viewing is desired such as entertainment and gaming video headset systems; night time or thermal imaging devices for hunting, camping, and other outdoor activities; and maintenance applications. In addition, in late 2015, we entered into a HMD technology licensing agreement with a Tier One consumer electronics company which includes the use of our 2K × 2K displays in its consumer headsets. In first quarter 2017, we entered into an agreement with a Tier One company interested in incorporating our proprietary dPd technology into potential headset products. Also during first quarter 2017, we performed tests for a Tier One consumer electronics company demonstrating our dPd technology as a path for AR and VR. We also entered into agreements with Tier One companies to develop a new display design for Virtual Reality and scale our dPd technology. During 2018 we designed a silicon backplane for this 4K design which is anticipated to have a 100 degree field of view. In late 2018 we received the first silicon wafers based on our 4K design from a foundry, and began testing and applying OLED materials to the wafers in furtherance of our development efforts.

Our Products

Our first commercial microdisplay, the super video graphics array, or SVGA+, OLED, was introduced in 2001. In 2008, we introduced engineering samples of our super extended graphics array, or SXGA, 120 OLED microdisplays and began selling significant quantities of the product in 2010. In late 2011, we began selling pre-production samples of our WUXGA OLED microdisplay which is now qualified and in production. In 2014, we released our Digital SVGA, and in 2015, we released our smaller pixel pitch digital SXGA and SXGA096, as well as an upgrade to the SXGA120 and WUXGA. Our OLED display products are being designed in products to be manufactured by OEM customers for a wide variety of military, commercial, and consumer applications. We offer our products to OEMs and other buyers as both separate components, integrated bundles coupled with our own optics, or complete systems. We also offer engineering support to enable customers to integrate our products into their own product development programs and design customized displays with resolutions or features to meet specific customer requirements. In 2015, we announced the development of a prototype immersive headset that uses our prototype 2K × 2K display. During 2016, we demonstrated what we believe to be the world's highest brightness (~4,500 cd/m²) and highest resolution (1920x1200 pixels) microdisplay using our proprietary dPd technology. During 2017, we developed prototype displays of our 2K x 2K display with an advanced backplane design and brightness exceeding 5,000 cd/m². During 2018, we continued to make improvements in the features and brightness of our displays and achieved over 7,500 nits in our WUXGA displays. We have shipped sample high brightness displays fabricated using our dPd technology to numerous customers. During 2019, we shipped our dPd tool to the vendor for upgrading to enable better performance and yield. We expect the tool to be operational following upgrade during second quarter 2020.

SVGA+ OLED Microdisplay Series (Super Video Graphics Array of 852x600)

The SVGA+ OLED Microdisplay Series is a 0.62 inch diagonal microdisplay that has a resolution of 852x600 triad pixels (1.53 million picture elements). The display also has an internal monochrome video decoder for low power night vision systems. The SVGA+ Rev3 OLED-XL microdisplay is a power efficient OLED display solution for near-eye personal viewer applications which uses less than 115 mW power in monochrome for thermal imaging applications, and lower than 175 mW at 200 cd/m² for full color video.

Digital SVGA OLED-XL

The Digital SVGA or DSVGA OLED-XL is an 800 × 600 display with 15 micron pixels and a 0.6 inch diagonal. It has all the benefits of our other digital displays, including lower power (100 mW monochrome and 135 mW color), high (10,000 to 1) contrast, and also features a digital composite signal interface, enabling a minimal physical interface for color applications.

SXGA096 OLED-XL/XLS (Super eXtended Graphics Array, 1280 x 1024)

The SXGA096 display features a 9.6-micron color pixel and was designed with the same level of feature integration as the DSVGA microdisplay, as well as a low pin-count, high speed low voltage differential signaling, or LVDS, data interface. The compactness and high information content of the SXGA096 makes it ideal for small form factor applications such as commercial headsets and smart weapon sights. This microdisplay incorporates OLED XLS technology more than doubling the OLED XL brightness. This expands the range of optical solutions that can be used with this display to result in smaller and lighter display modules.

SXGA OLED-XL (Super eXtended Graphics Array, 1280 x 1024)

Our SXGA OLED microdisplay with a 0.77 inch diagonal active area provides 3,932,160 sub-pixels in an active area. The display's pixel array comprises triads of vertical sub-pixels stacked side by side to make up each 12 × 12mm color pixel. The SXGA OLED-XL microdisplay offers digital signal processing, requiring less than 200mW under typical operation. The supported video formats are SXGA, 720p, DVGA (through 1280 × 960 pixel doubling), and both frame sequential and field sequential stereovision.

VGA OLED-XL (Video Graphics Array, 640 x 480)

The VGA OLED-XL microdisplay is our smallest (0.5 inches) and lowest powered (<60 mW monochrome/<100 mW color). The VGA OLED -XL utilizes the same voltage pixel drive architecture and "deep black" technology as the SXGA and WUXGA designs and includes motion artifact reduction technology like the WUXGA. Also like the SXGA and WUXGA, the VGA provides a FPGA driver design for maximum flexibility and versatility. The VGA interface is 30-bit digital RGB.

WUXGA OLED-XL (Widescreen Ultra eXtended Graphics Array, 1920 x 1200)

Our WUXGA OLED-XL microdisplay provides higher resolution than most high definition , or HD, flat screen televisions. With a triad sub-pixel structure this display is built of 7,138,360 active dots at 3.2 microns each. The WUXGA OLED-XL is built upon the voltage pixel drive approach first developed for the SXGA OLED-XL, which provides improved uniformity, ultra -high contrast (measured at greater than 100,000:1) and lower power. The advanced WUXGA design features our proprietary "deep black" architecture that ensures that off-pixels are truly black, automatically optimizes contrast under all conditions, and delivers better pixel to pixel uniformity. The WUXGA OLED-XL includes a low -power LVDS, serial interface and the overall display power requirement is typically less than 350 mW running standard video. Also included is our proprietary motion enhancement technology which smooths video display and virtually eliminates unwanted artifacts. Like the SXGA, the WUXGA provides a FPGA driver design available on a separate, lower power driver board, or as source code for integration into end product electronics giving OEM developers maximum versatility and flexibility. On-board circuitry ensures consistent color and brightness over a wide range of operating temperatures.

Design Reference Kits

We provide design reference kits, which include a microdisplay and associated electronics, to help OEMs evaluate our microdisplay products and to assist their efforts to build and test new products incorporating our microdisplays.

Integrated Modules

We provide near-eye virtual imaging modules that incorporate our OLED -on-silicon microdisplays with our lenses and electronic interfaces for integration into OEM products. We have shipped customized modules to several customers, some of which have incorporated our products into their own commercial products.

Prism Optics

We sell a high quality, large viewing angle prism optics with a wide range for eye positioning which is essential for incorporating our displays in immersive near-eye systems. This is an advanced molded plastic prism lens that permits our AMOLED microdisplays to provide realistic images that can be viewed for extended periods with reduced eye-fatigue.

Night Vision Smartphone Camera Attachment and Goggles

In 2016, we announced night vision products for the consumer markets and began limited sales in the first quarter of 2017. During the quarter ended June 30, 2018 we made a decision to exit this business. Our decision was based on lower than anticipated sales and an assessment performed during the quarter of the anticipated level of additional engineering, marketing and financial resources necessary to modify the products for an expanded market. As a result, we concluded an impairment had occurred and wrote-down the related inventory and production tooling which are reflected in cost of revenues in the accompanying Consolidated Statements of Operations.

Government Contract Funding

We derive a portion of our revenue from funding that we receive pursuant to research contracts or subcontracts funded by various agencies of the U.S. government.

In 2014, we were awarded a \$5 million contract to develop and produce an ultra -high resolution, high brightness, high contrast, full color OLED microdisplay at a low unit cost. This Defense-wide Manufacturing Science & Technology award, also known as ManTech, is funded by the Undersecretary of Defense for Acquisition, Technology, and Logistics and is administered by the U.S. Army RDECOM CERDEC Night Vision and Electronic Sensors Directorate Science and Technology Division. We earned a substantial portion of our R&D contract revenue in 2016 through the completion of this program during 2018 from this contract. In December 2018, we received a Defense Manufacturing Technology Achievement Award in conjunction with our work on this program.

During 2019, we made progress towards our goals of securing new U.S. military programs, broadening our presence in foreign military applications, and in commercial, including industrial and medical markets. We continue to participate in government discussions on microdisplay development for future defense aviation/mounted/dismounted programs and to position our displays as a key component of the future Soldier System 2030 technology suite for enhanced soldier performance and accelerated decision-making. We believe we

are the only U.S. based manufacturer of OLED microdisplays, and are also working to secure additional government funding to ensure the advancement of our manufacturing capabilities in support of defense programs that may benefit from our standard and high brightness OLED microdisplays including those incorporating our dPd technology.

Our contracts with the U.S. government require us to conduct the research effort described in the statement of work section of the contract. These contracts may be modified or terminated at the discretion of the government and are subject to authorization, appropriation and allocation of the required funding on an annual basis.

Military and Commercial Contract Funding

We also derive a portion of our revenue from funding we receive from customers in both the military and commercial sectors. During 2018 we were awarded contracts to design a displays for fixed and rotary wing aircraft and to develop a display suitable for use in a consumer AR VR application by one of our customers. During 2019, our efforts towards consumer AR VR application continued. We were also awarded several contracts to fund our efforts to improve production yields and OLED device performance .

Our Strategy

Our strategy is to strengthen our technology leadership position and our expertise in active matrix OLED technology and silicon wafer design, including our new dPd technology. We believe we are the only U.S. OLED microdisplay manufacturer and can capitalize on our experience by supplying microdisplays and virtual imaging technology solutions for applications in military, commercial, and consumer markets, globally.

We plan to continue our participation in U.S. government funded, and commercial contract research and development programs , which allow us to continue to advance our technology. We aim to provide microdisplays and complementary accessories to enable OEM customers serving a variety of markets, including military and commercial and consumer to develop and manufacture new and enhanced electronic products. The key elements of our strategy to achieve these objectives include:

- *Continue to be a valued supplier and partner to our Military customers .* Our OLED expertise has allowed us to provide displays that meet the demanding requirements of our Military customers for integration into night vision and thermal systems , aviation helmets, situational awareness and training systems in service of both U.S. Armed Forces and those of our NATO and other foreign military allies. As a U.S manufacturer of OLED microdisplays, we afford advantages to U.S prime contractors who are restricted by military procurement regulations from buying from, or manufacturing sensitive components in China and other restricted countries.
- *Strengthen our technology leadership.* Our advanced backplane designs, intellectual property portfolio coupled with our OLED fabrication techniques and know-how, and new dPd technology allow us to produce displays that offer a competitive edge for our customers who integrate our displays into their end products. As the first to utilize AMOLED microdisplays we have a depth of knowledge and expertise, and have specialized manufacturing equipment in our in-house foundry that we believe will enable us to continue to develop performance improvements. We believe that our participation in U.S. government funded contract research and development programs, combined with our continuous investment in OLED research and development, will enable us to continue our technology leadership position.
- *Optimize microdisplay manufacturing efficiencies while protecting proprietary processes and partner with large volume manufacturers to bring our technology into high volume production.* We intend to reduce our production costs primarily by improving manufacturing yields and lowering fixed costs through reduced cycle time and increased automation as well as equipment upgrades. We outsource certain portions of microdisplay production, such as chip fabrication, to minimize our costs and time to market. We intend to retain the OLED-related processes in-house, where we have a core competency and manufacturing expertise. We also believe that by keeping these processes under tight control we can better protect our proprietary technology and process know-how. We believe that this strategy will also enhance our ability to continue to optimize and customize processes and devices to meet customer needs. In order to address emerging high volume consumer electronics OLED microdisplay requirements, we are actively seeking manufacturing partners who can help us realize that objective.
- *Continue to build and maintain strong design capabilities.* We employ in-house design capabilities supplemented by outsourced design services. Building and maintaining this capability allows us to reduce engineering costs, accelerate the design process and enhance design accuracy to respond to our customers' needs as new markets develop. Contracting third party design support to meet demand and for specialized design skills may also remain a part of our overall long term strategy. Given these capabilities, we continue to look for opportunities to add value to our displays to increase revenue.
- *Develop OEM and mass production partnerships in the consumer and commercial HMD market.* As the consumer and enterprise augmented reality/virtual reality, or AR/VR, market matures, we believe our technology is positioned well to address the requirements of this segment. Developing customer partners is key to establishing eMagin as the market leader

for next generation displays for the consumer HMD market. Our potential channels to this market include partnering for the mass production of microdisplays and licensing our dPd technology. We believe that our dPd technology will enable next generation AR/VR hardware for the consumer and enterprise segments because the high brightness and high pixel per inch, or PPI, density afforded by the technology. Should we be successful in executing on mass production partnerships we believe it would allow us to be well positioned to meet the demands of a market predicted to experience significant growth through the 2020s.

Leverage strategic relationships. We have longstanding relationships with the US Military, and have received technology achievement awards from the US Army Communications – Electronics Research, Development and Engineering Center. We also have relationships with many U.S. and International prime military contractors. These and other external relationships serve an important role in our research and development efforts. Suppliers, equipment vendors, government organizations, contract research groups, external design companies, customer and corporate partners, consortia, and university relationships all enhance the overall research and development effort and help us develop new ideas and solutions. In addition, we participate in industry associations such as the Society for Information Display; SPIE, the international society for optics and photonics; the Army Aviation Association of America; SOPHIC, AUSA, and the National Defense Industrial Association, among others. We believe that strategic relationships allow us to determine better the demands of the marketplace and, as a result, allow us to focus our research and development activities on satisfying our customers' evolving requirements.

Sales and Marketing

We primarily provide our OLED display and optics components to OEMs to incorporate into their branded products and sell through their own well-established distribution channels. We have traditionally marketed and sold our products to customers through targeted selling, promotions, and select advertising. We identify companies with end products and applications for which we believe our products will provide a key differentiator. Marketing efforts focus on identifying prospects and communicating the product performance attributes foremost in the minds of purchasing decision-makers. We believe that this approach positions us to achieve the highest possible return on investment for our marketing expense.

We market our products in North America, Asia, and Europe directly from our sales office located at our Hopewell Junction, NY facilities. We also utilize distributors in Asia and Korea.

An OEM design cycle typically requires between six and 36 months, depending on the uniqueness of the market, the complexity of the end product or, in the case of military OEM customers, government procurement schedules. Because our microdisplays are the main functional component that defines many of our customers' end products, we work closely with customers to provide technical assistance throughout the product evaluation and integration process.

Another element of our marketing strategy is discussions with customers and presentations to existing and potential customers at military, industrial and consumer tradeshows. Trade shows we have exhibited at, or plan to exhibit at include; Shot Show, the largest event for the recreational hunting and shooting market, Defense and Commercial Sensing Exposition sponsored by the International Society for Optics and Photonics, Army Aviation Association of America, Special Operations Force Industry Conference, Defense and Security Equipment International, Association of the United States Army, Eurosatory-France, Land, Naval & Internal Homeland Security Systems Exhibition, the Society for Information Display, Solid State Devices and Materials conference, and the International Meeting on Information Display and OLED World Summit. A key element of our marketing is the expansion of our presence in new, high potential markets. We are experiencing heightened interest and requests for quotation from a variety of international companies that are familiar with the performance of our microdisplays.

Customers

We sell our products directly to military contractors and OEM's who use our displays in a diverse range of applications encompassing the military, and commercial (in which we include the medical and industrial market sectors). We classify revenues as either Military, Commercial, Consumer or Multiple based on our knowledge of the customer's products and markets served by our displays. Revenues classified as Multiple are for sales to customers that incorporate our displays in products that could be used for either military or commercial applications. We also perform funded R&D activities for both prime contractors, U.S. Government defense related agencies, and non-military customers, which are classified as Contract revenues. Product and Contract revenues are disclosed on the Consolidated Statements of Operations. We maintain relationships with OEMs in a diverse range of industries encompassing the military, commercial, and consumer market sectors.

The following table estimates revenues by market sectors:

	Twelve Months Ended December 31,	
	2019	2018
Military	65 %	75 %
Commercial, including industrial and medical	12 %	10 %
Consumer	4 %	6 %
Multiple	19 %	9 %
	100 %	100 %

The following table represents the domestic and international revenues as a percentage of total net revenues:

Geographic Location	Twelve Months Ended December 31,	
	2019	2018
United States	53 %	53 %
International	47 %	47 %

Backlog

As of December 31, 2019, we had a backlog of approximately \$11.7 million, an increase of approximately \$1.1 million over the backlog of \$10.6 million at December 31, 2018. Backlog is comprised of scheduled delivery dates through 2020 of non-binding customer purchase orders and purchase agreements, but does not include expected revenue from research and development contracts or expected non-recurring engineering programs under development. Backlog also does not include purchase orders for which deliveries are not or have not yet been scheduled. Our backlog may vary depending upon the timing of when orders are received and shipment dates scheduled, although we are generally seeing continuing growth in our year-over-year backlog. Variations in the magnitude and duration of purchase orders and customer delivery requirements may result in substantial fluctuations in backlog from period to period. Many of our purchase orders allow for rescheduling or cancellation by the customer with no or limited penalties.

Manufacturing Facilities

Our manufacturing facilities are located in Hopewell Junction, NY. We lease approximately 42,000 square feet of space, which houses our own equipment for OLED microdisplay fabrication and research and development, includes a 16,300 square foot class 10 clean room space, additional lower level clean room testing space, assembly space, and administrative offices.

Facilities services provided by the lessor at our expense include our clean room, pure gases, high purity de-ionized water, compressed air, chilled water systems, and waste disposal support. This infrastructure provided by our lease provides us with many of the resources of a larger corporation without the added overhead costs. It further allows us to focus our resources more efficiently on our product development and manufacturing goals.

We believe manufacturing efficiency is an important factor for success, especially in the consumer markets. We purchased \$1.1 million and \$2.3 million in 2019 and 2018, respectively, of additional equipment mainly related to manufacturing operations. The new equipment added in fiscal 2019 helped us to increase capacity and yield, address critical production points, and replace certain older equipment, which we expect will help us meet expected demand for our microdisplays.

To improve the performance of our older manufacturing equipment, we accelerated the implementation of production improvement measures early in the third quarter of 2019, including the following:

- daily collaboration between our R&D team and our manufacturing engineers to identify and resolve yield and production issues;
- extending the on-site engagement of an operating engineer from our OLED deposition tool vendor to work with our staff to improve the throughput of this equipment, which is a key component of our display manufacturing process; and
- enhancing our maintenance practices to improve machine performance and minimize unscheduled downtime and scheduling our maintenance staff to provide coverage during all operating shifts.

As a result of these efforts, production yields in the second half of 2019 improved over yields experienced in the first half of 2019. These efforts reduced the incidence of several types of display defects, and yields are continuing to recover and return to the upward trend anticipated as part of our long-term yield improvement plan. Several product lines are now at or above their operational yield plans levels and others are projected to continue to improve through the fourth quarter and beyond. Furthermore, production volumes were up over 50% during the second half of 2019 as compared to the first half of 2019 reflecting greater second half demand, which increased revenues and reduced unit costs. As a result of the improvements in manufacturing efficiency and throughput, our on time delivery of customer orders reached levels of over 95% during the third and fourth quarter.

Competition

The industry in which we operate is highly competitive. We face competition from legacy technologies such as transmissive liquid crystal displays from Kopin Corporation, and liquid crystal on silicon displays as well as from alternative display technologies such as virtual scanning retinal displays. There are many large and small companies that manufacture or have in development products based on these technologies.

We believe we are the only company with U.S.-based manufacturing capability for OLED microdisplays. There are other non-U.S. based manufacturers of high resolution OLED microdisplays that produce microdisplays that compete with our microdisplay products. They are Yunnan OLIGHTTEK Opto-Electronic Technology Co., Ltd. in China and MicroOLED in France. Both are shipping OLED microdisplays into the market. Sony Mobile Display Corp., in Japan, produces OLED microdisplays for integration into Sony's own higher-level systems such as digital cameras and HMDs and is now selling microdisplays to some commercial customers.

In addition, Olightek and BOE funded a joint venture to build a manufacturing facility in China to produce OLED microdisplays for the consumer AR/VR marketplace that came online in 2019, and, BOE has plans to build additional OLED manufacturing facilities in China. Kopin Corporation has entered into a supply agreement with both BOE and other Chinese manufacturers.

If other new OLED-based companies enter our markets we will face additional competition.

In addition, we compete with liquid crystal on silicon displays (LCOS), small transmissive liquid crystal displays (LCD), and OLED microdisplays manufactured by competitors. While we believe our OLED technology is technically superior by providing higher quality images, greater environmental ruggedness, reduced electronics cost and complexity, and improved power efficiency microdisplays, there is no assurance that we will continue to compete effectively. Competition can also come from inorganic micro LEDs, a technology still in the development stage but which could become a major competitor if all the technological hurdles are overcome.

Our ability to compete successfully will depend on a number of factors, both within and outside our control. These factors to include:

- our ability to design, manufacture and deliver new products, including those implementing dPd, on a timely basis;
- our ability to address the needs of our customers;
- the quality, performance, reliability, features, ease of use and pricing of our products;
- successful expansion of our manufacturing capabilities;
- our efficiency of production, and ability to manufacture and ship products on time;
- the rate at which OEM customers incorporate our product solutions into their own products;
- the market acceptance of our customers' products; and
- product or technology introductions by our competitors.

In addition, our customers may be reluctant to rely on a relatively small company such as eMagin for a critical component. We cannot assure you that we will be able to compete successfully against current and future competition, and the failure to do so would have a materially adverse effect upon our business, operating results and financial condition.

Intellectual Property

We have developed an intellectual property portfolio of patents, trade secrets and manufacturing know-how. Our intellectual property includes 35 U.S. patents and 18 pending U.S. patent applications (one of which have received a Notice of Allowance). We also have 3 issued foreign patents and 21 foreign filings. It is important to protect our investment in technology by obtaining and enforcing intellectual property rights, including rights under patent, trademark, trade secret, and copyright laws. We seek to protect inventions we consider significant by applying for patents in the United States and other countries when appropriate. The U.S. government holds licenses to much of our technology as a result of its funding a significant portion of our research and development.

Our intellectual property covers a wide range of materials, device structures, processes, and fabrication techniques, primarily concentrated in the following areas:

- OLED devices, architecture, structures, and processes;
- Display color processing and sealing;

- Active matrix circuit methodologies and designs;
- Lenses and tracking (eye and head);
- Ergonomics and industrial design;
- Wearable computer interface methodology;
- Legacy field emission and general display technologies; and
- Head-mounted display technology.

We believe that, in addition to patent protection, our success is dependent upon trade secrets, technical expertise, and know-how. To protect this information and know-how from unauthorized use or disclosure, we use nondisclosure agreements and other measures to protect our proprietary rights, and we require all employees and, where appropriate, contractors, consultants, advisors, and collaborators, to enter into confidentiality and non-competition agreements. In addition, we work to continually improve our IT security posture through, among other things; network monitoring, enhancements to firewalls, antivirus and malware prevention software, email spam blockers, and end user security training. We believe that our intellectual property portfolio, coupled with our strategic relationships and accumulated manufacturing know-how in OLED, gives us a significant advantage over potential competitors.

US Government Regulation

We are subject to certain export control laws, including the Export Administration Regulations, or EAR, and the International Traffic in Arms Regulations, or ITAR. Certain of our products may be deemed to be controlled for export by the U.S. Commerce Department's Bureau of Industry and Security under the EAR or by the U.S. State Department's Directorate of Defense Trade Controls, or DDTC, under the ITAR. Our ITAR products are custom displays developed for a specific military program or purpose. Failure to comply with these export control laws can lead to severe penalties, both civil and criminal, and can include debarment from contracting with the U.S. government.

Environmental Law Compliance

Our operations are subject to various governmental regulations related to toxic, volatile, experimental, and other hazardous chemicals used in our design and manufacturing process. While we continue to incur costs to comply with environmental regulations, we do not believe that such costs will have a material effect on our capital expenditures, earnings, or competitive position. Although we believe that we are currently in material compliance with all applicable environmental regulations, we cannot be certain that we or our suppliers have not in the past violated applicable laws or regulations, which violations could result in required remediation or other liabilities. We also cannot be certain that past use or disposal of environmentally sensitive materials in conformity with then existing environmental laws and regulations will protect us from required remediation or other liabilities under current or future environmental laws or regulations. Any failure to comply with environmental regulations could result in the imposition of fines or in the suspension or cessation of our operations.

Employees

As of December 31, 2019, we had a total of 96 employees, of which 94 were full time. None of our employees are represented by a labor union. We have not experienced any work stoppages and consider our relations with our employees to be good.

Available Information

Our website address is www.emagin.com. We make available free of charge through our website our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, our Proxy Statements and all amendments to such reports filed under the Securities Exchange Act of 1934, as amended, after we electronically file such material with, or furnish such material to, the Securities and Exchange Commission, or SEC. These reports may be accessed from our website by following the links under "Investors," then "SEC Filings." The information found on our website is not part of this or any other report we file with or furnish to the SEC. We assume no obligation to update or revise any forward-looking statements in this Annual Report or in other reports filed with the SEC, whether as a result of new information, future events or otherwise, unless we are required to do so by law. A copy of this Annual Report and our other reports is available without charge upon written request to Investor Relations, eMagin Corporation, 700 South Drive, Suite 201, Hopewell Junction, NY 12533.

We also post on our website the charters of our Audit, Compensation, Governance and Nominating committees, our Code of Ethics and any amendments of or waiver to such code of ethics, and other corporate governance materials recommended by the SEC as they occur, as well as earnings press releases and other business-related press releases.

You should carefully consider the following risk factors and the other information included herein as well as the information included in other reports and filings made with the SEC before investing in our common stock. The following factors, as well as other factors affecting our operating results and financial condition, could cause our actual future results and financial condition to differ materially from those projected. The trading price of our common stock could decline due to any of these risks, should they materialize, and you may lose part or all of your investment.

Risks Related To Our Financial Position

There is substantial doubt about our ability to continue as a going concern. If we are unable to continue as a going concern, our securities will have little or no value.

Our independent registered public accounting firm has issued a report for our financial statements at December 31, 2019 that includes an explanatory paragraph referring to our negative cash flow and recurring losses from operations, which raises substantial doubt about the Company's ability to continue as a going concern without additional capital becoming available. As a result of our historical losses and current financial condition, there is substantial doubt about our ability to continue as a going concern through March 31, 2021. Our ability to continue as a going concern is dependent upon our uncertain ability to generate sufficient cash flows from operations, obtain equity and/or debt financing and reduce expenditures. Specifically, we have incurred substantial net losses in the past and we may incur further losses in the future. Our net losses were \$4.3 million and \$9.5 million for the year ended December 31, 2019 and 2018. As of December 31, 2019, we had an accumulated deficit of \$240.6 million. We can give no assurances that our losses will not continue in the future or that we will be profitable in the future. Our prior losses and potential continuing or future losses have had, and would continue to have, an adverse effect on our financial condition. In order for us to achieve profitability, we must, among other things, generate sufficient cash flows and/or obtain the additional financing we need in order to continue as a going concern; generate additional revenue; manufacture our products on a timely basis and at a competitive cost; continue the progress achieved during the third and fourth quarters of 2019 in remediating the manufacturing issues that have resulted in production delays; integrate new equipment on our manufacturing line; meet our yield improvement initiatives; and successfully reduce expenses. If we are unable to successfully take these and other necessary steps, we may never operate profitably, and, even if we do achieve profitability, we may be unable to sustain or increase our profitability in the future. As of December 31, 2019, we had cash and working capital of \$3.5 million and \$8.8 million, respectively, and borrowings outstanding and borrowing availability under the Asset Based Lending Facility ("ABL Facility") of \$2.9 million and \$1.2 million, respectively. This is in comparison with cash and working capital of \$3.4 million and \$8.8 million, respectively, no borrowings outstanding and borrowing availability under the ABL Facility of \$4.1 million at December 31, 2018.

Our cash position as of December 31, 2019 reflects the receipt of approximately \$3.5 million in net proceeds from equity raises conducted during 2019, of which \$1.6 million were applied to repayment of our ABL Facility. In addition, we entered into an At The Market ("ATM") facility in November 2019 and raised approximately \$0.7 million in net proceeds through February 2020. However, our ongoing operations may require us to raise additional funds, and there are no assurances that such financing will be available on terms acceptable to us, or at all. Our financial statements do not include any adjustments that may result from the outcome of this uncertainty. If we are unable to reduce our expenditures or generate additional funds in the future through sales of our products, financings, government grants, loans or from other sources or transactions, we will exhaust our resources and will be unable to maintain our currently planned operations. If we cannot continue as a going concern, our stockholders would likely lose most or all of their investment in us.

Our financial condition is limited. If we are unable to generate additional revenue or secure additional external financing when, or if, required, we may have to curtail our operations or cease our development plans and operations.

Our ability to continue current operations and to execute on our plans is dependent on our ability to generate sufficient cash flows from operations, raise additional capital or refinance our indebtedness to meet our obligations. Although our yields improved in the third and fourth quarter of 2019, we experienced production issues in past quarters and there is a risk that a reoccurrence of these will negatively affect our products shipped, backlog, and accounts receivables for future quarters. Since the maximum amount of the borrowing base under our ABL Facility is based, in part, on our eligible accounts receivables, our borrowing ability could also be negatively impacted by any decrease in our accounts receivables. As of the December 31, 2019, we had \$2.9 million in borrowings outstanding, and unused borrowing availability of \$1.2 million, under our ABL Facility.

We incurred net losses of \$4.3 million and \$9.5 million for the year ended December 31, 2019 and 2018, respectively. Net cash used in operating activities for the years ended December 31, 2019 and 2018 was \$5.1 million and \$6.4 million, respectively. On December 31, 2019, we had cash and cash equivalents of \$3.5 million, net working capital of \$8.8 million, and accounts payable of \$1.3 million. This compares to \$3.4 million, \$8.8 million, and \$2.0 million, respectively, at December 31, 2018. As of December 31, 2019, we had an accumulated deficit of \$240.6 million.

If we are unable to meet our obligations as they become due over the next twelve months, we may not be able to continue our current operations.

Our ability to continue current operations and to execute on our plans is dependent on our ability to generate sufficient cash flows from operations, maintain our relationships with vendors and customers, secure alternative financing or refinance our indebtedness to meet our obligations. If adequate funds are not available to us on a timely basis, or at all, we may have to reduce current operations and delay capital expenditures in order to conserve cash.

Based on our current operating plan, working capital levels, financial projections, and our ability to borrow under our ABL Facility, we anticipate being able to meet our financial obligations as they become due through the fourth quarter of 2020. However, there can be no assurance that our plans will be achieved.

If we do not achieve our current financial projections we will be unable to maintain our currently planned operations after the fourth quarter of 2020, and we may violate one or more of our financial covenants under our ABL Facility. In addition, there can be no assurance that we will be able to renew or extend our ABL Facility when it matures on December 31, 2020. Although preliminary renewal discussions with the lender are positive and the Company expects the facility to be renewed upon expiration, there is no assurance the lender will renew or extend this facility, or continue to make funds available during 2020 and beyond at present availability levels, or at all. We have no additional committed external sources of funds and additional financing may not be available when we need it or on terms that are favorable to us, if at all. In addition, we may seek additional capital, or consider strategic alternatives.

We cannot provide assurance that any actions by us to raise additional funds would be successful or, if such efforts were successful, that we would generate sufficient funds to meet our financial obligations as they become due and allow us to continue current operations or that these actions would be permitted (i) under the terms of our existing or future debt agreements or (ii) by the holders of a majority of the then outstanding Series B Convertible Preferred Stock, whose approval, pursuant to the Certificate of Designations governing our Series B Convertible Preferred Stock, is required in order for us to take certain actions. If we do not have enough cash to fund our operations to profitability and if we are unable to secure additional capital, we may be required to seek strategic alternatives, including but not limited to a potential business combination, a sale of our company or our business, or a reduction and/or cessation of our operations.

We have had losses in the past and may incur losses in the future .

Our accumulated deficit is approximately \$240.6 million as of December 31, 2019. We can give no assurances that we will be profitable in the future. We cannot assure you that if we become profitable that we will be able to sustain profitability or that we will not continue to incur operating losses in the future.

We may require significant additional capital funding and such capital may not be available to us.

In the event that our operating expenses or working capital levels are higher than anticipated, we may be required to implement contingency plans within our control to conserve and/or enhance our liquidity to meet operating needs. Such plans include implementing cost reductions and restricting our operations. Our cash requirements relate primarily to working capital needed to operate and grow our business, including funding operating expenses and increasing production and inventory levels. Our ability to meet future liquidity needs and capital requirements will depend upon numerous factors, including the timing and quantity of product orders and shipments, the timing and amount of our operating expenses; the continued ability to raise funds under our ATM facility, the timing and costs of working capital needs; the extent to which our products gain market acceptance; the timing and costs of product development and introductions; the extent of our ongoing and any new research and development programs; and any potential changes in our strategy or our planned activities. If we are unable to fund our operations without additional external financing and therefore cannot sustain future operations, we may be required to delay, reduce and/or cease our operations.

Alternatives we would consider for additional funding include additional equity or debt financings, or licensing of our technology. In addition to raising capital, we may also consider strategic partnerships and government programs that may be available to the Company. If we are unable to obtain additional capital, we may not be able to sustain our future operations and may be required to delay, reduce and/or cease our operations. We cannot assure you that any necessary additional financing will be available on terms favorable to us, or at all. Additionally, even if we raise sufficient capital through additional equity or debt financings, strategic alternatives or otherwise, there can be no assurance that the revenue or capital infusion will be sufficient to enable us to develop our business to a level where it will be profitable or generate positive cash flow. If we raise additional funds through the issuance of equity or convertible debt securities, the percentage ownership of our stockholders could be significantly diluted, and these newly issued securities may have rights, preferences or privileges senior to those of existing stockholders. If we incur additional debt, a substantial portion of our operating cash flow may be dedicated to the payment of principal and interest on such indebtedness, thus limiting funds available for our business activities. The terms of any debt securities issued could also impose significant restrictions on our operations. Broad market and industry factors may seriously harm the market price of our common stock, regardless of our operating performance, and may adversely impact our ability to raise additional funds.

We have entered into a sales agreement relating to shares of our common stock we may offer and sell from time to time through our sales agent. The value of our securities could decline, and investors could lose all or part of their investment. The risks and uncertainties we describe are not the only ones we face. Additional risks not presently known to us or that we currently deem immaterial may also impair our business operations and trading price of our common stock. Investing in our common stock, could result in dilution to the extent of the difference between the assumed public offering price per share of our common stock and the net tangible book value per share of our common stock immediately after the offering.

Our operating results have significant fluctuations.

In addition to the variability resulting from the short-term nature of commitments from our customers, other factors contribute to significant periodic quarterly fluctuations in results of operations. These factors include, but are not limited to, the following:

- the receipt and timing of orders and the timing of delivery of orders;
- the inability to adjust expense levels or delays in adjusting expense levels, in either case in response to lower than expected revenues or gross margins;
- the volume of orders relative to our manufacturing capacity;
- manufacturing delays due to equipment failures;
- changes due to quarterly fair value adjustments of our warrant liability;
- product introductions and market acceptance of new products or new generations of products;
- changes in cost and availability of labor and components;
- product mix;
- variation in operating expenses; regulatory requirements and changes in duties and tariffs;
- pricing and availability of competitive products and services; and
- changes, whether or not anticipated, in economic conditions.

Our ABL Facility contains various covenants limiting the discretion of our management in operating our business, which could prevent us from capitalizing on business opportunities and taking some corporate actions.

Our ABL Facility imposes operating and financial restrictions on us. These restrictions limit or restrict, among other things, our ability to:

- incur additional indebtedness;
- make restricted payments (including paying dividends on, redeeming, repurchasing or retiring our capital stock);
- make investments;
- create liens;
- sell assets;
- engage in transactions with affiliates; and
- consolidate, merge or sell all or substantially all of our assets.

In addition, the ABL Facility also requires us to maintain compliance with certain financial covenants. Our ability to comply with these covenants may be affected by events beyond our control, including those described in this "Risk Factors" section. Any breach of any of the covenants contained in the ABL Facility could result in an event of default under one or more of the documents governing such obligations which would allow the lenders under the ABL Facility to prevent us from borrowing under the ABL Facility and/or declare all borrowings outstanding to be due and payable. Although relations with the lender under our ABL Facility are positive, there can be no assurance that the lender will grant a future covenant waiver or continue to lend to us at present availability levels, or at all. In the event of an acceleration of payment obligations under the ABL Facility, we would likely be unable to pay our outstanding indebtedness with our cash and cash equivalents then on hand. We could be required to seek alternative sources of funding, which may not be available on commercially reasonable terms, or terms as favorable as our current agreement or at all. If we are unable to provide alternative means of financing our operations, we may be required to reduce our operations or take other actions that are inconsistent with our current business practices or strategy.

Repayment of any outstanding indebtedness under our ABL Facility is dependent, and repayment of any future indebtedness we may incur, will be dependent upon our ability to generate cash from operations.

Our ability to make payments on our ABL Facility and to fund planned capital expenditures depends, and our ability to make payments on any additional future debt we may incur will depend, upon our ability to generate cash from our future operations. This, to a certain extent, is subject to financial, competitive, legislative, regulatory, and other factors that are beyond our control. In addition, if we cannot service the indebtedness under our ABL Facility, or any future indebtedness we may incur, we may have to take actions such as selling assets, raising additional capital or reducing or delaying capital expenditures, any of which could impede the implementation of our

Our ABL Facility matures on December 31, 2020, and there can be no assurance that we will be able to extend or renew the facility.

Our ABL Facility expires on December 31, 2020. While relations with the lender are positive, there is no assurance the lender will renew or extend this facility, or continue to make funds available during 2020 and beyond at present availability levels, or at all. We may not be able to refinance our indebtedness under our ABL Facility, or any future indebtedness we may incur, or take such other actions, if necessary, on commercially reasonable terms, or at all. Our ability to meet our obligations as they become due is dependent, in part, on our ability to borrow under our ABL Facility. If the ABL Facility is not renewed or extended it may impair our ability to continue current operations and to execute on our plans.

Our debt is variable rate debt, and increases in interest rates could adversely affect us by causing us to incur higher interest costs with respect to such variable rate debt.

The ABL Facility subjects us to interest rate risk. The rate at which we pay interest on amounts borrowed under such facility fluctuates with changes in interest rates. Accordingly, with respect to any amounts from time to time outstanding under the ABL Facility, we are and will be exposed to changes in interest rates. If we are unable to adequately manage our debt structure in response to changes in the market, our interest expense could increase, which would negatively affect our financial condition and results of operations. There were \$2.9 million net outstanding borrowings under the ABL Facility as of December 31, 2019.

Risks Related To Manufacturing

The manufacture of active matrix OLED microdisplays encompasses several complex processes resulting in irregular production schedules, including production delays and interruptions, which could adversely affect our operating results.

Our product technology and manufacturing processes are evolving which can result in production challenges and difficulties. We cannot assure you that we will be able to produce our products in sufficient quantity and quality to maintain existing customers and attract new customers. In addition, we cannot assure you that we will not experience manufacturing problems which could result in delays in delivery of orders or product introductions.

Several steps of our production processes are dependent upon certain critical machines and tools which have in the past, and could in the future, result in delivery interruptions and reduced revenues.

We currently have equipment that is critical to our manufacturing operations for which there is no redundancy. If we experience any significant disruption in the operation of our manufacturing facility or a serious failure of a critical piece of equipment, we may be unable to supply microdisplays to our customers in a timely manner. Interruptions in our manufacturing could be caused by equipment problems, the introduction of new equipment into the manufacturing process or delays in the delivery of new manufacturing equipment. Lead-time for delivery, installation, testing, repair, and maintenance of manufacturing equipment can be extensive. We have experienced production interruptions and/or delays in the past, including in the first and second quarters of fiscal 2019 and no assurance can be given that we will not lose potential sales or be unable to meet production orders due to future production delays or interruptions in our manufacturing line. For example, in the fourth quarter of fiscal 2018 and six months ended June 30, 2019, production yields and output were negatively impacted by delays due to the failure of certain production equipment in our manufacturing line. These issues also led to a lower gross margin and reduced display revenue. Although we accelerated the implementation of remedial measures to address these issues during the in third and fourth quarters of 2019, which helped to improve revenues, yields and production throughput in the third and fourth quarters of 2019, there can be no assurance as to the continued effectiveness of the remedial measures we implemented or that yields and production volumes will remain at or above levels experienced in during such periods.

We rely on key sole source and limited source suppliers.

We depend on a number of sole source or limited source suppliers for certain raw materials, components, and services. These include silicon wafers, circuit boards, graphic integrated circuits, passive components, materials and chemicals, and equipment support. We maintain several single-source supplier relationships either because alternative sources are not available or because the relationship is advantageous to us due to performance, quality, support, delivery, capacity, or price considerations (or a combination thereof). Even where alternative sources of supply are available, qualification of the alternative suppliers and establishment of reliable supplies could result in delays and a possible loss of sales, which could materially and adversely affect our operating results. We do not manufacture the silicon integrated circuits on which we incorporate our OLED technology. Instead, we provide the design layouts to semiconductor contract manufacturers who manufacture the integrated circuits on silicon wafers. Our inability to obtain sufficient quantities of components and other materials or services on a timely basis could result in manufacturing delays, increased costs and ultimately in reduced or delayed sales or lost orders which could materially and adversely affect our operating results. Generally, we do not have long-term contracts or written agreements with our source suppliers but instead operate on the basis of short term purchase orders.

We face risks related to health epidemics and other outbreaks, including the recent coronavirus outbreak, which could adversely affect general commercial activity and the economies and financial markets of many countries and significantly disrupt our operations.

In December 2019, a strain of coronavirus surfaced in Wuhan, China causing in an outbreak, with infections throughout China and abroad, which has resulted in increased travel restrictions and disruptions to global supply chains. Since some of our business partners are in China and other Asian countries, the outbreak of coronavirus in China, other countries in Asia or elsewhere could adversely affect our business, financial condition or results of operations. For example, we have a distributor in China and purchase wafers used for production from foundries in South Korea and Taiwan. China, South Korea and, to a lesser degree, Taiwan have each been impacted by the outbreak. At this time, the coronavirus has not caused major disruptions to our supply chain or operations or customers, nor has it affected our employees. However, if the coronavirus outbreak continues to spread and becomes a global pandemic, it may affect our employees, our customers and our suppliers in ways which could materially adversely affect our business, financial condition and results of operations. In addition, the continued spread of the virus globally and measures taken by the governments of countries affected by the coronavirus, such as the imposition of travel restrictions and quarantines, the temporary closure of factories and the suspension of business or other activities in an attempt to curb the spread of the illness could lead to a world-wide economic downturn which could materially adversely affect our business.

Our results of operations, financial condition and business would be harmed if we were unable to balance customer demand and capacity.

As customer demand for our products changes, and as we enter new markets which may require higher volume mass production, we must be able to ramp up or adjust our production capacity to meet demand or enter into relationships with high volume manufacturers. We are continually taking steps to address our manufacturing capacity needs for our products. If we are not able to expand our manufacturing capacity or enter into relationships with high volume manufacturers, our prospects may be limited and our business and results of operations could be adversely impacted. If we experience delays or unforeseen costs associated with adjusting our capacity levels, we may not be able to achieve our financial targets. For some of our products, vendor lead times exceed our customers' required delivery time, causing us to order to forecast rather than order based on actual demand. Ordering raw material, building finished goods, and scheduling contract manufacturer production for our consumer products based on forecasts exposes us to numerous risks, including potential inability to service customer demand within an acceptable timeframe, holding excess inventory or having unabsorbed manufacturing overhead.

Variations in our production yields impact our ability to reduce our costs and could cause our margins to decline and our operating results to suffer.

All of our products are manufactured using technologies and processes that are highly complex. The number of usable items, or yield, from our production processes may fluctuate as a result of many factors, including but not limited to the following:

- variability in our manufacturing process and repeatability;
- changes in manufacturing personnel due to turnover or employee absences;
- production challenges associated with the introduction of new display types;
- contamination of the manufacturing environment or equipment;
- equipment failure, power outages, or modification to our manufacturing processes;
- lack of consistency and adequate quality and quantity of component parts and other raw materials;
- defects in packaging either within or without our control;
- any transitions or changes in our production process, planned or unplanned;
- certain customer requirements outside of our normal specifications; and
- changes in the mix of display types produced from period to period.

Variations in our production yields impact our costs and cause our margins to decline and our operating results to suffer. For example, in the fourth quarter of fiscal 2018 and the first and second quarters of fiscal 2019, we experienced low production yields and output and an adverse impact on our gross margins and operating results due to equipment failures that began in the fourth quarter of 2018. Although we began implementing remedial measures during the fourth quarter of 2018, manufacturing delays continued into the second quarter of 2019 and, as a result, shipments were less than forecast and production yields and output continued to be negatively impacted during the second quarter of 2019. Although we accelerated the implementation of our remedial measures during the third and fourth quarters of 2019 and production yields improved in the third and fourth quarters of 2019, there can be no assurance as to the continued effectiveness of the remedial measures we implemented or that yields and production volumes will remain at or above levels experienced during such periods.

Risks Related To Our Intellectual Property

We may not be successful in protecting our intellectual property and proprietary rights.

We rely on a combination of patents, trade secret protection, licensing agreements and other arrangements to establish and protect our proprietary technologies. If we fail to successfully enforce our intellectual property rights, our competitive position could suffer, which could harm our operating results. Patents may not be issued for our current patent applications; third parties may challenge, invalidate or circumvent any patent issued to us; unauthorized parties could obtain and use information that we regard as proprietary despite our efforts to protect our proprietary rights; rights granted under patents issued to us may not afford us any competitive advantage; others may independently develop similar technology or design around our patents; and protection of our intellectual property rights may be limited in certain foreign countries. Any future infringement or other claims or prosecutions we may bring against third parties based on our intellectual property could have a material adverse effect on our business. Any such claims could be time consuming to assert, result in costly litigation, divert management's attention and resources, or result in our entering into royalty or licensing agreements. Protection of intellectual property has historically been a large yearly expense for us. For a period prior to 2008, we were not in a financial position to properly protect all of our intellectual property, and may not be in a position to properly protect our position or stay ahead of competition in new research and the protecting of the resulting intellectual property. Some of our commercial agreements may limit our ability to enforce certain of our intellectual property rights against certain parties.

In addition to patent protection, we also rely on trade secrets and other non-patented proprietary information relating to our product development and manufacturing activities. We try to protect this information through appropriate efforts to maintain its secrecy, including requiring employees and third parties to sign confidentiality agreements. We cannot be sure that these efforts will be successful or that the confidentiality agreements will not be breached. We also cannot be sure that we would have adequate remedies for any breach of such agreements or other misappropriation of our trade secrets or that our trade secrets and proprietary know-how will not otherwise become known or be independently discovered by others.

We might incur intellectual property and technology risk by conducting business in certain foreign jurisdictions.

Conducting business in certain foreign jurisdictions might increase our risk of direct or indirect theft or compromise of our intellectual property. We rely on a combination of patents, trade secret protection, licensing agreements, and other arrangements to establish and protect our proprietary technologies. We cannot be sure that these efforts will be successful nor can we be sure that we have appropriate remedies for any breach.

Changes to the patent law in the United States could diminish the value of patents in general, thereby impairing our ability to protect our products.

Obtaining and enforcing our patents involves both technological and legal complexity and is therefore costly, time consuming and inherently uncertain. Patent reform legislation in the United States, including the Leahy-Smith America Invents Act, or the America Invents Act, could increase those uncertainties and costs. The America Invents Act was signed into law on September 16, 2011, and many of the substantive changes became effective on March 16, 2013. The America Invents Act reforms United States patent law in part by changing the U.S. patent system from a "first to invent" system to a "first inventor to file" system, expanding the definition of prior art, and developing a post-grant review system. This legislation changes United States patent law in a way that may weaken our ability to obtain patent protection in the United States for those applications filed after March 16, 2013.

Further, the America Invents Act created new procedures to challenge the validity of issued patents in the United States, including post-grant review and *inter partes* review proceedings, which some third parties have been using to cause the cancellation of selected or all claims of issued patents. For a patent with an effective filing date of March 16, 2013 or later, a petition for post-grant review can be filed by a third party in a nine month window from issuance of the patent. A petition for *inter partes* review can be filed immediately following the issuance of a patent if the patent has an effective filing date prior to March 16, 2013. A petition for *inter partes* review can be filed after the nine month period for filing a post-grant review petition has expired for a patent with an effective filing date of March 16, 2013 or later. Post-grant review proceedings can be brought on any ground of invalidity, whereas *inter partes* review proceedings can only raise an invalidity challenge based on published prior art and patents. In these adversarial actions, the U.S. Patent and Trademark Office or USPTO reviews patent claims without the presumption of validity afforded to U.S. patents in lawsuits in U.S. federal courts and uses a lower burden of proof than used in litigation in U.S. federal courts. Therefore, it is generally considered easier for a competitor or third party to have a U.S. patent invalidated in a USPTO post-grant review or *inter partes* review proceeding than invalidated in a litigation in a U.S. federal court. If any of our patents are challenged by a third party in such a USPTO proceeding, there is no guarantee that we will be successful in defending the patent, which could result in a loss of the challenged patent right to us.

Depending on future actions by the U.S. Congress, the U.S. courts and the USPTO, the laws and regulations governing U.S. patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future.

We may face third party claims from competitors, non-practicing entities, and others that our business practices or products infringe adversely held intellectual property rights. We may face third party claims that our employees or contractors have misappropriated and unlawfully disclosed to us for our benefit third party trade secrets or other proprietary information. Furthermore, we have agreed to indemnify customers, licensees and partners for certain intellectual property claims brought against them. Defending any such claims, whether or not meritorious, would cause us to incur costs and may divert the attention of management and technical personnel. Resolution of any such claims by litigation or settlement may entail payment of damages, entry into license agreements, changes to our business practices or products, and changes in our relationships with our customers, employees, licensees, partners, or contractors.

Risks Related To Information Technology

We rely on our information technology systems to conduct our business. If we experience an interruption in our operation, our business and financial results could be adversely affected.

The efficient operation of our business is highly dependent on our information technology systems including our manufacturing equipment and process. If our information technology systems are damaged or an interruption is caused by a computer systems failure, viruses, fire, natural disasters, or power loss, the disruption to our normal business operations and impact on our costs, competitiveness, and financial results could be significant.

Security breaches and other disruptions could compromise our information technology systems and expose us to liability, which could cause our business and reputation to suffer.

In the ordinary course of our business, we will collect and store sensitive data on our systems and networks, including our proprietary business information and that of our customers and suppliers, and personally identifiable information of our customers and employees. The secure storage, processing, maintenance, and transmission of this information is critical to our operations. Despite the security measures we employ, our information technology systems and networks may be vulnerable to attacks by hackers or breached due to employee error, malfeasance or other disruptions. Any such breach could compromise such systems and networks and the information stored therein could be accessed, publicly disclosed and/or lost or stolen. Any such access, disclosure or other loss of information could result in legal claims or proceedings, liability under laws that protect the privacy of personal information, disruption to our operations, damage to our reputation and/or loss of competitive position.

Risks Related To Our Business

Design, manufacturing and sale of microdisplays for commercial systems, including within the medical and industrial sectors, may be impacted by changes in demand by OEM customers for advanced microdisplays, limited availability of suppliers and foundries, high costs of raw materials, pricing pressure brought by the marketplace or governmental customers, the necessity to attract and retain key scientific and technical personnel, the ability to protect intellectual property and knowhow, and the ability to innovate and introduce new products.

Historically, approximately 16% of our revenue comes from sales to customers using our displays for commercial applications, including within the industrial and medical sectors. Demand by commercial customers for OLED displays could decline due to overall economic conditions and the development of alternative technologies that might offer the enhanced performance of OLED displays at a lower price. Demand for products incorporating our displays could be also affected if our OEM customers are impacted by changes in governmental, regulation or medical regulation or insurance reimbursements that influence demand for medical devices that use our products.

Our industry relies on a limited number of foundries to produce the silicon wafers and backplanes required by our manufacturing process. Should foundries be unable to provide the required amount of silicon wafers for production, because of either capacity constraints or natural disasters, our ability to manufacture microdisplays would be affected. In addition, there are a limited number of suppliers who provide raw materials used in microdisplay manufacturing, some of whom are small companies with limited resources. Certain of our organic chemicals and other production materials are costly and high raw materials costs could negatively impact our ability to profitably sell displays at market pricing levels.

Procurement of microdisplays for military systems is subject to changes in federal budget priorities and if government funding is discontinued or reduced, our ability to develop or enhance products could be limited and our business results, operations and financial conditions could be adversely affected.

Historically, a large portion of our revenue is from military contracts. Procurement of microdisplays for military systems is subject to changes in federal budget priorities. Government programs are subject to authorization, appropriation and allocation of funding on an annual basis. Additionally, funding can be shifted to other programs if the government changes budget priorities, such as in a time of

war or for other reasons. Government contracts are also subject to the risk that the government may not appropriate and allocate all funding contemplated by the contract. Government contracts generally permit the contracting authority to terminate the contract for the convenience of the government and in the event of a premature termination of a contract, the full value of such contract will not be realized.

The research and development and product procurement contracts of the customers we supply may be similarly impacted by government budget decisions. If the government funding is discontinued or reduced, our ability to develop or enhance products could be limited and our business results, operations and financial conditions could be adversely affected.

In addition, we must comply with certain laws and regulations relating to the administration and performance of federal government contracts. These laws and regulations affect how we conduct business under our federal government contracts, including in our role as a subcontractor. In complying with these laws and regulations, we may incur additional costs, and non-compliance may lead to the assessment of fines and penalties, including contractual damages or the loss of business.

If government agencies or companies discontinue or curtail their funding for our research and development programs, our business may suffer.

Changes in federal budget priorities could adversely affect our contract and display product revenue. Historically, U.S. government agencies have funded a significant part of our research and development activities. Our funding has the risk of being redirected to other programs when the government changes budget priorities, such as in time of war or for other reasons. Government contracts are also subject to the risk that the government agency may not appropriate and allocate all funding contemplated by the contract. In addition, our government contracts generally permit the contracting authority to terminate the contract for the convenience of the government. The full value of the contracts would not be realized if they were prematurely terminated. We may be unable to incur sufficient allowable costs to generate the full estimated contract values. Furthermore, the research and development and product procurement contracts of the customers we supply may be similarly impacted. If the government funding is discontinued or reduced, our ability to develop or enhance products could be limited and our business results or operations and financial conditions could be adversely affected.

We are subcontracted by certain prime contractors who obtain their military contracts through a request for proposal, or RFP, process, which is a competitive bidding process that involves unique risks that could materially reduce our revenues or profits.

Our customers include certain prime contractors who contract directly with the military and U.S. government agencies, and then subcontract certain of those contracts to us. These prime contractors customers obtain their military and government agency contracts through an RFP process, which typically involves intense competition and presents a number of risks that may not typically be present in the market, including the need to devote substantial time and attention of management and key employees to the preparation of a proposal that may not be accepted. The rules governing government purchasing typically require open bidding by possible providers against a list of requirements established under existing or specially-created procedures, which results in significant pricing pressure in order to ensure a bid is competitive. This pricing pressure can lead our prime contractor customers to seek lower prices for our products and services, as a subcontractor, which could lead to lower margins than we may otherwise be able to obtain from other parties in the market. Additional risks associated with RFPs which may impact the revenue we receive from our prime contractor customers include the ability of the U.S. government unilaterally to:

- suspend or prevent contractors for a set period of time from receiving new U.S. government contracts or extending existing contracts based on violations or suspected violations of laws or regulations;
- terminate our customers' existing U.S. government contracts, including for poor performance or if funds become unavailable or are not provided to the applicable governmental agency;
- reduce the scope and value of our customers' U.S. government contracts and/or revise the timing for work to be performed;
- audit and object to our customers' contract-related costs and fees, including allocated indirect costs;
- control and potentially prohibit the export of our customers' products developed under the contract;
- claim rights to products, including intellectual property, developed under our customers' contracts;
- change certain terms and conditions in our customers' U.S. government contracts; and
- cancel outstanding RFP solicitations.

The rules governing RFPs also allow the U.S. government to terminate any of its contracts with our prime contractor customers, either for its convenience or if our customers default by failing to perform in accordance with the contract schedule and terms, and also allow our prime contractor customers to terminate their contracts with subcontractors, such as the Company, in the event of U.S. government terminations, or if we default by failing to perform. Termination-for-convenience provisions generally enable our customers to recover only costs incurred or committed, settlement expenses, and profit on the work completed prior to termination. Termination-for-default provisions do not permit these recoveries and would make our prime contractor customers liable for excess costs incurred by the government in procuring undelivered items from another source. These factors may reduce or eliminate our expected revenue from subcontracts with our prime contractor customers.

We may not be able to obtain all or a significant portion of the government grants, incentives or other funding for which we have applied and may in the future apply. As a result, our business and prospects may be adversely affected. Our customers and potential customers applying for government grants, incentives or loans may condition purchases of our products upon their receipt of these funds or delay purchases of our products until their receipt of these funds.

We have applied for federal grants, incentives and other forms of funding under government programs designed specifically for microdisplay industry contractors and participants. We anticipate that in the future there will be new opportunities for us to apply for grants, incentives and other forms of funding from the United States government. Our ability to obtain grants, incentives and other forms of funding from government sources is subject to the availability of funds under applicable government programs and approval of our applications to participate in such programs. The application process for these grants, incentives and other forms of funding is and will be highly competitive, often involving multiple levels of military and U.S. government approval before a grant or incentive can be approved and funds disbursed, each of which is subject to risk and uncertain timing.

Moreover, we may not be able to satisfy or continue to satisfy the requirements and milestones imposed by the granting authority as conditions to receipt of the grant, incentive or other form of funding. In addition, not all of the terms and conditions associated with such funds may be disclosed to us at the start of the application process, and once disclosed, there may be terms and conditions with which we are unable to comply or which are commercially unacceptable to us. There is no assurance that any applications we submit for grants, incentives or other forms of funding will ultimately be approved, and if approved, that approval and funding will occur within our desired timeframe or that we will be able to satisfy or continue to meet any ongoing requirements or milestones. If we are not successful in obtaining government grants or incentives and we are unable to find alternative sources of funding to meet our planned capital needs, our business and prospects could be materially adversely affected.

In addition, certain of our customers and potential customers that also apply for government grants, incentives or loans may condition purchases of our products and systems upon receipt of such funds or delay purchases of our products and systems until receipt of such funds, and if those customers and potential customers do not receive these funds or the receipt of these funds is significantly delayed, our results of operations could suffer.

Provisions in certain of our commercial agreements and our military business may prevent or delay an acquisition of, partnership with, or investment in our Company, and our ability to develop OEM and mass production partnerships, which could decrease the market value of our common stock.

Provisions in certain of our commercial agreements may discourage, delay or prevent a merger, acquisition or other change in control that stockholders may consider favorable. In addition, as a contractor and subcontractor to the U.S. federal government, we are subject to and must comply with various government regulations that impact our operating costs, profit margins and the internal organization and operation of our business. As a result, these provisions and business may prevent or delay an acquisition of, partnership with, or investment in, our Company and our ability to develop OEM and mass production partnerships and could limit the price that strategic investors may be willing to pay in the future for shares of our common stock. They could also deter potential partners or acquirers of our Company, thereby reducing the likelihood that you could receive a premium for your common stock in an acquisition.

The success of our AR/VR efforts is dependent upon widespread acceptance of AR/VR systems and products in the consumer and commercial marketplace.

The market for AR/VR systems and products is developing slower than originally forecast. The success of our efforts in the AR/VR market will depend on the widespread acceptance of AR/VR systems and products in the consumer, enterprise and commercial markets. At present, it is difficult to assess or predict with any assurance the potential size, timing and viability of the consumer and commercial AR/VR market, as well as our ability to partner with a foundry or other mass production partner to produce a sufficient number of displays to address this potential market.

The market segment for our AR/VR systems and products may take longer to develop than we anticipate or may not develop, which may impact our ability to grow revenues.

Although we believe our AR/VR systems and products hold great potential for use in various consumer market applications, our success will depend on the acceptance of systems and products by consumers and in particular the widespread adoption of our AR/VR hardware. We are unable to predict when or if consumers will adopt our AR/VR hardware. In addition, even if consumers accept our AR/VR product, manufacturers may choose to manufacture our competitors' products. Our success in commercializing our AR/VR products is very important in our ability to achieve positive cash flow and profitability. If we are unable to commercialize our AR/VR product, we may be unable to increase revenues or achieve profitability or positive cash flow.

We seek to develop widespread market acceptance of our AR/VR systems and products in the consumer market which is extremely competitive and is highly susceptible to fluctuations in demand.

We seek to develop widespread market acceptance of our AR/VR systems and products in the consumer market. This market is extremely

competitive and is highly susceptible to fluctuations in demand. The consumer products market is intensely competitive and price sensitive. Sales of consumer products have historically been dependent upon discretionary spending by consumers. Consumers may defer or alter purchasing decisions based on economic conditions or other factors, and accordingly could cause a reduction in demand for products such as our AR/VR systems and products. Any downturn in global economic conditions may cause a decrease in overall consumer demand and in demand for our products in the near term and possibly longer and prevent our systems and products from gaining widespread market acceptance.

Some of our business is subject to U.S. government procurement laws and regulations.

We must comply with certain laws and regulations relating to the formation, administration and performance of federal government contracts, including the EAR and the ITAR. These laws and regulations affect how we conduct business under our federal government contracts, including the business that we do as a subcontractor. In complying with these laws and regulations, we may incur additional costs, and non-compliance may lead to the assessment of fines and penalties, including contractual damages, or the loss of business.

Our international sales and operations are subject to export laws and regulations.

We must comply with all applicable export control laws, including the EAR and ITAR. Certain of our products may be deemed to be controlled for export by the U.S. Commerce Department's Bureau of Industry and Security under the EAR or by the DDTC under the ITAR. We believe certain of our products will be classified as defense articles and licenses from the DDTC will be required for exports. Failure to comply with these export control laws can lead to severe penalties, both civil and criminal, and can include debarment from contracting with the U.S. government.

The microdisplay market is highly competitive with several competing technologies.

The industry in which we operate is highly competitive, characterized by rapid technological change, changes in market requirements and competition from legacy technologies, alternative display technologies, and from large and small companies that manufacture or have in development products based on these technologies. This competition could result in pricing pressures, lower sales, reduced margins, and lower market share. Our ability to compete successfully will depend on a number of factors, both within and outside our control. These factors to include:

- our ability to design, manufacture and deliver new products, including those implementing dPd, on a timely basis;
- our ability to address the needs of our customers;
- the quality, performance, reliability, features, ease of use and pricing of our products;
- successful expansion of our manufacturing capabilities;
- our efficiency of production, and ability to manufacture and ship products on time;
- the rate at which OEM customers incorporate our product solutions into their own products;
- the market acceptance of our customers' products; and
- product or technology introductions by our competitors.

In addition, our customers may be reluctant to rely on a relatively small company such as eMagin for a critical component. We cannot assure you that we will be able to compete successfully against current and future competition, and the failure to do so would have a materially adverse effect upon our business, operating results and financial condition.

Our competitors have many advantages over us.

The industry in which we operate is highly competitive. We face competition from legacy technologies such as transmissive liquid crystal displays from Kopin Corporation and liquid crystal on silicon displays as well as from alternative display technologies such as virtual scanning retinal displays. There are many large and small companies that manufacture or have in development products based on these technologies. In addition, we compete with liquid crystal on silicon displays, small transmissive liquid crystal displays, and OLED microdisplays manufactured by competitors. Competition can also come from inorganic micro LEDs, a technology still in the development stage but which could become a major competitor if the technological hurdles are overcome. Certain of our competitors have operations based in China, where lower manufacturing and production costs may provide them with a competitive advantage. For example Olightek and BOE recently funded a joint venture to build a manufacturing facility that came online in 2019, BOE has plans to build additional OLED manufacturing facilities in China and Kopin Corporation has entered into a supply agreement with both BOE and other Chinese manufacturers. We cannot assure you that we will be able to compete successfully against current and any future competition, and the failure to do so would have a materially adverse effect upon our business, operating results and financial condition.

We are subject to cyclical demand.

Our business strategy is dependent on OEM manufacturers' building and selling products that incorporate our OLED displays as components into those products. Fluctuations in demand could cause significant harm to our business. Our inventory may increase if

build products to meet anticipated demand that does not develop. Alternatively, we may experience production shortages if demand increases sharply and we are unable to meet requirements to produce an increased number of displays.

Our products are subject to lengthy OEM development periods.

We sell most of our microdisplays to OEMs who will incorporate them into products they sell. OEMs determine during their product development phase whether they will incorporate our products. The time elapsed between initial sampling of our products by OEMs, the custom design of our products to meet specific OEM product requirements, and the ultimate incorporation of our products into OEM consumer products is significant, often with a duration of between one and three years. If our products fail to meet our OEM customers' cost, performance or technical requirements or if unexpected technical challenges arise in the integration of our products into OEM consumer products, our operating results could be significantly and adversely affected. Long delays in achieving customer qualification and incorporation of our products also could adversely affect our business and our operating results.

In order to increase or maintain our profit margins we may have to continuously develop new products, product enhancements and new technologies.

In some markets, prices of established products tend to decline over time. In order to increase or maintain our profit margins over the long -term, we believe that we will need to continuously develop new products, product enhancements and new technologies that will either slow price declines of our products or reduce the cost of producing and delivering our products. While we anticipate many opportunities to reduce production costs over time, there can be no assurance that these cost reduction plans will be successful, that we will have the resources to fund the expenditures necessary to implement certain cost-saving measures, or that our costs can be reduced as quickly as any reduction in unit prices. We may also attempt to offset the anticipated decrease in our average selling price by introducing new products with higher selling prices that may or may not offset price declines in more mature products. If we fail to do so successfully, our results of operations could be materially and adversely affected.

We have recorded an impairment loss related to our decision to exit the consumer night vision products business, however, there is a risk that additional losses may be incurred upon the final disposition or sale of this business.

We have various agreements and purchase orders in place with two contract manufacturers located in Asia for defined quantities of our consumer night vision products business that will no longer be fulfilled. In March 2019, we received a demand letter seeking payment of \$ 0.9 million of outstanding invoices relating to purchased inventory from Suga Electronics Limited, or Suga. Suga is a contract manufacturer located in China, which manufactured product sold by their consumer night vision business . We have responded to the demand letter, and requested that Suga provide substantiation of purchased inventory. During September and October 2019, the Company held discussions with Suga to attempt to reach a settlement; however, in November 2019 the Company received a formal request for arbitration which Suga filed with the International Chamber of Commerce or ICC. The Company retained local counsel in Hong Kong to represent it before the ICC and in December 2019 filed an answer to Suga's request for arbitration including a counterclaim seeking repayment of amounts previously paid to Suga.

As disclosed in the Financial Statements to this Report, during the quarter ended June 30, 201 8, we made a decision to exit the consumer night vision business and accrued approximately \$1.0 million related to invoices received for inventory purchased by Suga in anticipation of future production. While we believe that we have adequately accrued for the losses and are in discussions to resolve related claims by the contract manufacturers, there is the risk that additional losses or litigation related expenses may be incurred above the amounts accrued for as of December 31, 2019, if we fail to resolve these claims in a timely and/or favorable manner.

In order to successfully develop and manufacture our products, ensure adequate product supply to respond to customer demand, and effectively promote widespread adoption of our products and services in the consumer market, we must establish and maintain reliable relationships with high volume manufacturers. If we cannot maintain or develop strategic relationships to jointly develop our technologies and manufacturing processes, our products will not be as competitive.

We must partner with a high volume manufacturer in order to successfully develop and manufacture our products on a scale that would allow us to meet customer demand in the consumer and enterprise markets for AR/VR systems and products, and improve our products' and services' market acceptance. We are continually taking steps to address our manufacturing capacity and we are actively searching for potential manufacturing partners. However, it may take several quarters to establish a strategic relationship with a manufacturing partner and we may not be able to find a manufacturing partner on favorable terms or at all, as a result, we may be unable to secure a supply for certain of our products within anticipated time frames or at all. If we are unable to secure sufficient or reliable supplies of our products from high volume manufacturers, our ability to meet customer demand for our business may be adversely affected and this could have a material adverse effect on us.

Our operating results are substantially dependent on the development and acceptance of new products and technology innovations.

Our future success may depend on our ability to develop new and lower cost solutions for existing and new markets and for customers to accept those solutions. We must introduce new products in a timely and cost-efficient manner, and we must secure production orders

for those products from our customers. The development of new products is a highly complex process, and we historically have experienced delays in completing the development and introduction of new products. Some or all of those technologies or products may not successfully make the transition from the research and development phase. Even when we successfully complete a research and development effort with respect to a particular product or technology, it may fail to gain market acceptance. The successful development and introduction of these products depends on a number of factors, including the following:

- achievement of technology advances required to make commercially viable devices;
- the accuracy of our predictions of market requirements;
- acceptance of our new product designs;
- acceptance of new technology in certain markets;
- the availability of qualified research and development and product development personnel;
- our timely completion of product designs and development;
- our ability and available resources to expand sales;
- our ability to develop repeatable processes to manufacture new products in sufficient quantities and at low enough costs for commercial sales;
- our customers' ability to develop competitive products incorporating our products; and
- acceptance of our customers' products by the market.

If any of these or other factors become problematic, we may not be able to develop and introduce these new products in a timely or cost-effective manner. Our failure to introduce new products and technologies that meet market demands could harm our business and operating results.

We generally do not have long -term contracts with our customers.

Our business has primarily operated on the basis of short-term purchase orders. We receive some longer term purchase agreements and procurement contracts, but we cannot guarantee that we will continue to do so. Our current purchase agreements, depending on the circumstances, can be cancelled or revised without penalty. We plan production primarily on the basis of internally generated forecasts of demand based on communications with customers, and available industry data which makes it difficult to accurately forecast revenues. If we fail to accurately forecast operating results, our business may suffer and the market price of our shares may decline.

Our business strategy for the consumer market will fail if we cannot continue to form strategic relationships with companies that manufacture and use products that could incorporate our active matrix OLED technology.

Our prospects could be significantly affected by our ability to develop strategic alliances with high volume manufacturers and with OEMs for incorporation of our active matrix OLED microdisplay technology into their products. While we intend to continue to establish strategic relationships with manufacturers of electronic consumer products, personal computers, chipmakers, lens makers, equipment makers, material suppliers, and/or systems assemblers; there is no assurance that we will be able to continue to establish and maintain strategic relationships on commercially acceptable terms, or that the alliances we do enter into will realize their objectives. Failure to do so would have a material and adverse effect on our business.

Our business depends on international transactions.

We purchase materials from and subcontract manufacturing processes to companies located abroad and may be adversely affected by political and currency risk, as well as the additional costs of doing business with foreign entities. In addition, 47% of our sales were to OEMs outside the U.S. in fiscal 2019 and 2018, respectively. These sales expose us to currency and political risk. In addition, some of our non-U.S. customers have longer receivable periods as is customary in those countries.

Our business may expose us to product liability claims.

Our business may expose us to potential product liability claims. We may face liability to product users for damages resulting from the faulty design or manufacture of our products. While we maintain product liability insurance coverage, there can be no assurance that product liability claims will not exceed coverage limits, fall outside the scope of such coverage, or that such insurance will continue to be available at commercially reasonable rates, if at all.

Our business is subject to environmental regulations and possible liability arising from potential employee claims of exposure to harmful substances used in the development and manufacture of our products.

We are subject to various governmental regulations related to toxic, volatile, experimental and other hazardous chemicals used in our design and manufacturing process. Our failure to comply with these regulations could result in the imposition of fines or in the suspension or cessation of our operations. Compliance with these regulations could require us to acquire costly equipment or to incur other significant expenses. We develop, evaluate and utilize new chemical compounds in the manufacture of our products. While we

attempt to ensure that our employees are protected from exposure to hazardous materials, we cannot assure you that potentially harmful exposure will not occur or that we will not be liable to employees as a result.

Economic conditions may adversely impact our business, operating results and financial condition.

Economic conditions and market instability may affect our customers and suppliers. Any adverse financial or economic impact to our customers may impact their ability to pay timely, or result in their inability to pay. It may also impact their ability to fund future purchases, or increase the sales cycles which could lead to a reduction in revenue and accounts receivable. Our suppliers may increase their prices or may be unable to supply needed raw materials on a timely basis which could result in our inability to meet customers' demand or affect our gross margins. Our suppliers may also impose more stringent payment terms on us. The timing and nature of any recovery in the credit and financial markets remains uncertain, and there can be no assurance that market conditions will improve in the near future or that our results will not be materially and adversely affected.

Our success depends in large part on attracting and retaining highly skilled and qualified technical and consulting personnel.

We must recruit and hire highly skilled technical personnel as employees and as independent contractors in order to develop our products and to assist with servicing and upgrades to our equipment. The competition for skilled technical employees is intense and we may not be able to retain or recruit such personnel. We must compete with companies that possess greater financial and other resources than we do, and that may be more attractive to potential employees and contractors. To be competitive, we may have to increase the compensation, including salaries, bonuses, stock options and other fringe benefits, offered to employees in order to attract and retain such personnel. The costs of attracting and retaining new personnel may have a materially adverse effect on our business and our operating results.

Changes in management could have an adverse effect on our business. We are dependent upon the active participation of several key management personnel in our strategic planning and in our day-to-day business operations. In October 2019, we adopted a work status reduction (the "Work Status Reduction") with the objective of reducing expenses and saving cash. Pursuant to the Work Status Reduction, the work status of each of our executive officers was reduced by twenty percent (20%) and the work status of certain of our vice presidents was reduced by either twenty percent (20%) or ten percent (10%). There is a risk that the executive officers impacted by the Work Status Reduction may be dissatisfied with this change and seek employment with companies that possess greater financial and other resources, or offer to increase their compensation. Due to our limited resources, if we are unable to retain our key employees, we may not be able to effectively manage our operations or timely replace qualified personnel, which may result in weaknesses in operations, further loss of employees and/or reduced productivity among remaining employees. In addition, if we are unable to effectively manage the Work Status Reduction and our other cost reduction measures, our business could be adversely affected.

Our success depends in a large part on the continuing service of key personnel.

Changes in management could have an adverse effect on our business. We are dependent upon the active participation of several key management personnel in our strategic planning and in our day-to-day business operations. We also need to recruit additional management in order to expand our business. The failure to attract and retain additional management or personnel could have a material adverse effect on our operating results and financial performance.

Risks Related To Our Common Stock

The market price of our common stock may be volatile.

The market price of our common stock has been subject to wide fluctuations. During our four most recently completed fiscal quarters, the closing price of our stock ranged from a low of \$0.27 to a high of \$1.07 during 2019. The market price of our common stock in the future is likely to continue to be subject to wide fluctuations in response to various factors, including, but not limited to, the following:

- variations in our operating results and financial conditions;
- sales of common stock under the Company's At The Market equity trading facility;
- changes in financial estimates or investment recommendations by securities analysts following our business;
- actual or anticipated announcements of technical innovations, commercial partnerships, new product developments, or design wins by us or our competitors;
- general conditions in the semiconductor and flat panel display industries; and
- worldwide economic and financial conditions.

In addition, the public stock markets have experienced extreme price and volume fluctuations that have particularly affected the market price for many technology companies and that have often been unrelated to the operating performance of these companies. The broad market fluctuations and other factors may continue to adversely affect the market price of our common stock.

Failure to meet the maintenance criteria of the NYSE American may result in the delisting of our common stock, which could result in lower trading volumes and liquidity, lower prices of our common shares and make it more difficult for us to raise capital.

Our common stock is listed on the NYSE American, and we are subject to its continued listing requirements, including maintaining certain share prices and a minimum amount of shareholder's equity. If we are unable to comply with the NYSE American continued listing requirements, including its trading price requirements, our common stock may be suspended from trading on and/or delisted from the NYSE American. Although we have not been notified of any delisting proceedings, there is no assurance that we will not receive such notice in the future or that we will be able to then comply with NYSE American listing standards. The delisting of our common stock from the NYSE American may materially impair our stockholders' ability to buy and sell our common stock and could have an adverse effect on the market price of, and the efficiency of the trading market for, our common stock. In addition, the delisting of our common stock could significantly impair our ability to raise capital. In December 2019, we received shareholder approval for the Board of Directors to declare a reverse stock split in the range of 10 for 1 to 20 for 1, which may become necessary should the Company fail to meet the NYSE American minimum share price requirement.

The market price of our common stock may be adversely affected by market conditions affecting the stock markets in general, including price and trading fluctuations on the NYSE American.

Market conditions may result in volatility in the level of, and fluctuations in, market prices of stocks generally and, in turn, our common stock and sales of substantial amounts of our common stock in the market, in each case being unrelated or disproportionate to changes in our operating performance. Concerns over global stability and economic conditions in the United States and abroad have contributed to the extreme volatility of the markets which may have an effect on the market price of our common stock.

Future issuances of our common stock could lower our stock price and dilute the interests of existing stockholders.

We may issue additional shares of our common stock in the future, including shares of our common stock in connection with acquisitions, strategic partnerships or joint ventures that we believe will allow us to complement our growth strategy, increase market share in our current markets and expand into adjacent markets, broaden our technology and intellectual property, and strengthen our relationships with distributors and OEMs. Any future issuances of shares of our common stock, including in connection with any future acquisition, partnership or joint venture, may result in the dilution of existing stockholders to the extent we are required to issue equity securities.

The issuance of a substantial amount of common stock could have the effect of substantially diluting the interests of our current stockholders. In addition, the sale of a substantial amount of common stock in the public market, either in the initial issuance or in a subsequent resale by investors who acquired such common stock in a private placement, could have a material adverse effect on the market price of our common stock.

Concentration of ownership of our stock may enable one stockholder or a small number of stockholders to significantly influence matters requiring stockholder approval.

Including ownership of Series B Preferred Shares able to vote on an as converted basis with their common share interests, as of December 31, 2019, Stillwater Holdings LLC (f/k/a Stillwater LLC) owned approximately 12% of our outstanding voting stock, Flat Creek Fiduciary Management, as trustee of a trust which the sole member of Stillwater Holdings LLC has investment control, owned approximately 7% of our outstanding voting stock, Stillwater Trust LLC owned 4% of our outstanding voting stock and the sole member of Stillwater Holdings LLC is the investment manager of Rainbow Gate Corporation, which owned approximately 3% of our outstanding voting stock. Together such stockholders owned approximately 26% of our outstanding voting stock. As a result, these stockholders, if they act together, may be able to exert a significant degree of influence over matters requiring stockholder approval, including the election of directors and approval of significant corporate transactions. Further, if these stockholders act together with another stockholder, Ginola Limited, which has common directors with Mount Union Corp. and Chelsea Trust Company, as of December 31, 2019, they would collectively have represented approximately 31% of our outstanding voting stock. This concentration of ownership may facilitate or hinder a change of control and might affect the market price of our common stock. Furthermore, the interests of this concentration of ownership may not always coincide with our interests or the interests of other stockholders. Nevertheless, the ability to influence the election of our Board of Directors or otherwise have influence does not modify the fiduciary duties of our Board of Directors to represent the interests of all stockholders.

The holders of shares of our Series B Convertible Preferred Stock have and may continue to exercise significant influence over us.

Under the terms of the Certificate of Designations, or Certificate of Designations, governing our Series B Convertible Preferred Stock, the Series B Convertible Preferred Stock generally ranks, with respect to liquidation and dividends, senior to our other securities and, so long as any shares of Series B Convertible Preferred Stock remain outstanding, the approval of the holders of a majority of the Series B Convertible Preferred Stock outstanding at the time of approval is required in order for us to, among other things, (i) amend, alter or repeal our Certificate of Incorporation if such amendment, alteration or repeal adversely affects the powers, preferences or special rights of the Series B Convertible Preferred Stock; (ii) create any series or class of stock ranking senior as to liquidation rights or dividends with the Series B Convertible Preferred Stock (other than Series A Senior Secured Convertible Preferred Stock, or Series A Convertible

Preferred Stock; (iii) redeem or pay dividends on, any class or series of our capital stock (other than the Series A Convertible Preferred Stock); or (iv) so long as there are holders of at least 577 outstanding shares of Series B Convertible Preferred Stock, issue any shares of Series B Convertible Preferred Stock. The terms of the Certificate of Designations also provide that so long as any shares of Series B Convertible Preferred Stock are outstanding, we may not offer, sell or issue, or enter into any agreement, arrangement or understanding to offer, sell or issue, any common stock or common stock equivalent (other than offerings that are underwritten on a firm commitment basis and registered with the SEC under the Securities Act) without the approval of holders of a majority of the Series B Convertible Preferred Stock outstanding. These and other rights granted to holders of the Series B Convertible Preferred Stock enable the holders thereof to exert substantial control over our affairs and potentially exercise their control in a manner adverse to the interest of our other stockholders. The consent requirements set forth in the Certificate of Designations has impaired, and may in the future impair, our ability to raise capital. For example, the holders of the Series B Convertible Preferred Stock recently withheld consent to a proposed capital raise and, as a result, we were unable to proceed with the proposed offering. There can be no assurance that the holders of our outstanding Series B Convertible Preferred Stock will not withhold their consent for any future capital raise we propose. The consent requirements set forth in the Certificate of Designations may also delay or prevent any acquisition of our company on terms that our other stockholders may desire and may adversely affect the market price of our common stock.

We do not intend to pay cash dividends. We last paid a dividend on our capital stock in 2012 and we do not anticipate paying any dividends in the foreseeable future. Consequently, any gains from an investment in our securities will likely depend on whether the price of our common stock increases.

We have not paid dividends on any of our capital stock since 2012. We currently intend to retain our future earnings, if any, to fund the development and growth of our business. In addition, our ABL Facility prohibits us from paying cash dividends on our common stock. As a result, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future. Consequently, in the foreseeable future, you will likely only experience a gain from your investment in our securities if the price of our common stock increases.

If industry or financial analysts do not publish research or reports about our business, or if they issue inaccurate or unfavorable research regarding our common stock, our share price and trading volume could decline.

Due to our continued losses and lack of consistent revenue growth, there may be little or no incentive for securities analysts of brokerage and other financial firms to provide investment coverage of us or to recommend the purchase of our common stock. Any reports that industry or financial analysts publish about us or our business may influence the trading market for our common stock. We do not control these analysts, whether they provide investment coverage of us, or the content and opinions included in any of their reports. If any of the analysts who cover us issues an inaccurate or unfavorable opinion regarding our company, our stock price would likely decline. In addition, the stock prices of many companies in the technology industry have declined significantly after those companies have failed to meet, or significantly exceed, the financial guidance publicly announced by the companies or the expectations of analysts. If our financial results fail to meet, or significantly exceed, our announced guidance or the expectations of analysts or public investors, analysts could downgrade our common stock or publish unfavorable research about us. If, after initiating coverage of us and our common stock, one or more analysts were to cease coverage of our company or fail to publish reports on us regularly, our visibility in the financial markets could decrease, which in turn could cause our stock price or trading volume to decline.

A provision in our certificate of incorporation and by-laws may prevent or delay an acquisition of our Company, which could decrease the market value of our common stock.

Provisions of Delaware law, our certificate of incorporation and our by-laws may discourage, delay or prevent a merger, acquisition or other change in control that stockholders may consider favorable. These provisions may also prevent or delay attempts by stockholders to replace or remove our current management or members of our Board of Directors. These provisions include:

- limitations on the removal of directors;
- advance notice requirements for stockholder proposals and nominations;
- the inability of stockholders to act by written consent or to call special meetings;
- the ability of our Board of Directors to make, alter or repeal our by-laws; and
- the authority of our Board of Directors to issue preferred stock with such terms as our Board of Directors may determine.

In addition, we are subject to the provisions of Section 203 of the Delaware General Corporation Law, which limits business combination transactions with stockholders of 15% or more of our outstanding voting stock that our Board of Directors has not approved. These provisions and other similar provisions make it more difficult for stockholders or potential acquirers to acquire us without negotiation. These provisions may apply even if some stockholders may consider the transaction beneficial to them. As a result, these provisions could limit the price that investors are willing to pay in the future for shares of our common stock. These provisions might also discourage a potential acquisition proposal or tender offer, even if the acquisition proposal or tender offer is at a premium over the then current market price for our common stock.

We are subject to significant corporate regulation as a public company and failure to comply with all applicable regulations could subject us to liability or negatively affect our stock price.

As a publicly traded company, we are subject to a significant body of regulation, including the Sarbanes -Oxley Act of 2002. While we have developed and instituted a corporate compliance program based on what we believe are the current best practices in corporate governance and continue to update this program in response to newly implemented or changing regulatory requirements, we cannot provide assurance that we are or will be in compliance with all potentially applicable corporate regulations. If we fail to comply with any of these regulations, we could be subject to a range of regulatory actions, fines or other sanctions or litigation. If we must disclose any material weakness in our internal control over financial reporting, our stock price could decline.

ITEM 1B. UNRESOLVED STAFF COMMENTS

Not applicable.

ITEM 2. PROPERTIES

Our manufacturing facility and corporate headquarters are located in Hopewell Junction, NY, where we lease approximately 42,000 square feet. The NY facility houses our equipment for OLED microdisplay fabrication, assembly operations, research and development, and product development functions. The lease expires in 2024. We lease approximately 2,000 square feet of office space for design and product development in Santa Clara, CA and the lease expires in 2021.

We believe our facilities are adequate for our current and near-term needs. We believe we will be able to renew these leases or obtain alternative spaces or additional spaces as necessary under acceptable terms. See Note 10 to the Consolidated Financial Statements for more information about our lease commitments.

ITEM 3. LEGAL PROCEEDINGS

From time to time, we may become subject to various legal proceedings that are incidental to the ordinary conduct of our business. In March 2019, we received a demand letter seeking payment of \$0.9 million of outstanding invoices relating to purchased inventory from Suga Electronics Limited, or Suga, a contract manufacturer located in China, which manufactured product sold by their consumer night vision business. We have responded to the demand letter, and requested that Suga provide substantiation of purchased inventory.

During September and October 2019, the Company held discussions with Suga to attempt to reach a settlement; however, in November 2019 the Company received a formal request for arbitration which Suga filed with the International Chamber of Commerce or ICC. The Company retained local counsel in Hong Kong to represent it before the ICC and in December 2019 filed an answer to Suga's request for arbitration including a counterclaim seeking repayment of amounts previously paid to Suga. The parties are currently awaiting the appointment of an arbitrator by the ICC.

As disclosed in the Financial Statements to this Report, during the quarter ended June 30, 2018, we made a decision to exit the consumer night vision business and accrued approximately \$1.0 million related to invoices received for inventory purchased by Suga in anticipation of future production. While we believe that we have adequately accrued for the losses and are in discussions to resolve related claims by the contract manufacturers, there is the risk that additional losses or litigation related expenses may be incurred above the amounts accrued for as of December 31, 2019, if we fail to resolve these claims in a timely and/or favorable manner.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED SHAREHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Our common stock trades on the NYSE American under the symbol "EMAN".

As of March 3, 2020, there were 143 holders of record of our common stock. This does not include persons whose stock is in nominee or "street name" accounts through brokers.

Dividends

There were no declared dividends in 2019 and 2018. Our Asset Based Lending Facility ("ABL Facility") restricts us from paying cash dividends while any obligations are outstanding under the facility. Subject to this restriction, any future decisions to pay cash dividends will be at the discretion of our Board of Directors. It is our current intention to retain any future profits for use in the development and expansion of our business and for general corporate purposes.

Securities Authorized for Issuance under Equity Compensation Plans

Information about our equity compensation plans is incorporated herein by reference to Part IV, Note 14 of this Annual Report.

Purchases of Equity Securities by the Issuer

There were no repurchases of our common stock during the year ended December 31, 2019.

ITEM 6. SELECTED FINANCIAL DATA

Not applicable.

Introduction

The following discussion should be read in conjunction with our financial statements and notes thereto. Our fiscal year ends December 31. This document contains certain forward-looking statements including, among others, anticipated trends in our financial condition and results of operations and our business strategy. These forward-looking statements are based largely on our current expectations and are subject to a number of risks and uncertainties. Please see "Statement Regarding Forward-Looking Statements" and Part I, Item 1A, "Risk Factors". Actual results could differ materially from these forward-looking statements. Important factors to consider in evaluating such forward-looking statements include changes in external factors or in our internal budgeting process which might impact trends in our results of operations; unanticipated working capital or other cash requirements; changes in our business strategy or an inability to execute our strategy due to unanticipated changes in the industries in which we operate; and various competitive market factors that may prevent us from competing successfully in the marketplace. Forward-looking statements do not represent our views as of any date other than the date of this Report.

Business

We design, develop, manufacture and market organic light emitting diode, or OLED miniature displays, which we refer to as OLED-on-silicon microdisplays, virtual imaging products that utilize OLED microdisplays, and related products. We also perform research in the OLED field. Our virtual imaging products integrate OLED technology with silicon chips to produce high-resolution microdisplays which, when viewed through a magnifying headset, create virtual images that appear comparable in size to that of a computer monitor or a large-screen television. Our products enable our original equipment manufacturer, or OEM, customers in the military and commercial markets to develop and market improved or new electronic products.

We believe that our OLED microdisplays offer a number of significant advantages over comparable liquid crystal microdisplays, including higher contrast, greater power efficiency, less weight, more compact size, and negligible image smearing. Using our active matrix OLED technology, many computer and electronic system functions can be built directly into the OLED microdisplay silicon backplane, resulting in compact, high resolution and power efficient systems. Already proven in military and commercial systems, our product portfolio of OLED microdisplays deliver high-resolution, virtual images that perform effectively even in extreme temperatures and high-vibration conditions.

During the fourth quarter of 2018, equipment issues led to lower yields and decreased production volumes, which resulted in a lower gross margin and reduced display revenues. In addition, delays in the qualification of a new, high brightness XLS display type led to the inability to fulfill associated customer orders during the quarter. Although we qualified the XLS display type and began implementing remedial production measures during the fourth quarter of 2018, manufacturing issues continued into the second quarter of 2019, resulting in shipments for the second quarter of fiscal 2019 that were less than forecast and yields and production volumes that were below pre-fourth quarter 2018 levels. As a result, early in the third quarter of 2019 we began accelerating the implementation of remedial measures, although additional technical changes may be necessary before we see a return to pre-fourth quarter 2018 production yields. There can be no assurance as to the ongoing effectiveness of any remedial measures we have implemented or that yields and production volumes will return to the levels previously achieved.

To improve the performance of our production process and older manufacturing equipment, we accelerated the implementation of the following production improvement measures early in the third quarter of 2019:

- daily collaboration between our R&D team and our manufacturing engineers to identify and resolve yield and production issues;
- extending the on-site engagement of an operating engineer from our OLED deposition tool vendor to work with our staff to improve the throughput of this equipment, which is a key component of our display manufacturing process; and
- enhancing our maintenance practices to improve machine performance and minimize unscheduled downtime and scheduling our maintenance staff to provide coverage during all operating shifts.

As a result of these efforts, production yields in the second half of 2019 improved over yields experienced in the first half of 2019. These efforts reduced the incidence of several types of display defects, and yields are continuing to recover and return to the upward trend anticipated as part of our long-term yield improvement plan. Several product lines are now at or above their operational yield plan levels and others are projected to continue to improve through the fourth quarter and beyond. Furthermore, production volumes were up over 50% during the second half of 2019 as compared to the first half of 2019 reflecting greater second half demand, which increased revenues and reduced unit costs. As a result of the improvements in manufacturing efficiency and throughput, our on time delivery of customer orders reached levels of over 95% during the third and fourth quarter. Our backlog at December 31, 2019 was \$11.7 million compared to backlog of \$10.6 million at December 31, 2018.

These efforts did not result in significant additional expense during the third and fourth quarter because they utilized our R&D and production engineers, maintenance staff, and other resources that were in place and already included in our second quarter results.

During the fourth quarter of 2019, we also implemented spending reductions and controls to reduce our overall cost structure. These measures lowered our overall spending as evidenced by the reduction during the second quarter of our R&D and SG&A expenses both year-over-year and sequentially quarter-to-quarter.

In October 2019, we adopted a work status reduction (the "Work Status Reduction") with the objective of reducing expenses and saving cash. Pursuant to the Work Status Reduction, the work status of each of our executive officers was reduced by twenty percent (20%) and the work status of certain of our vice presidents was reduced by either twenty percent (20%) or ten percent (10%). We also negotiated reductions in service fees, which are expected to further reduce our expenses going forward.

Liquidity and Going Concern

As explained below under Liquidity and Capital Resources, the accompanying consolidated financial statements have been prepared on the going concern basis, which assumes we will continue to operate as a going concern and which contemplates the realization of assets and the satisfaction of liabilities and commitments in the normal course of business. However due to continuing losses, our financial position, and uncertainty regarding our ability to borrow under the Asset Based Lending Facility ("ABL Facility"), or continue to raise funds under our ABL Facility, we may not be able to meet our financial obligations as they become due without additional financing or sources of capital.

At December 31, 2019, we had cash and cash equivalents of \$3.5 million, net working capital of \$8.8 million, \$2.9 million of debt outstanding under our ABL Facility and borrowing availability of \$1.2 million. This is in comparison with cash and working capital of \$3.4 million and \$8.8 million, respectively, no borrowings outstanding and borrowing availability under the ABL Facility of \$4.1 million at December 31, 2018. Net cash used in operating activities for the year ended December 31, 2019 was \$5.1 million, compared to \$6.4 million for the year ended December 31, 2018. Our backlog at December 31, 2019 was \$11.7 million compared to backlog of \$10.6 million at December 31, 2018.

We have taken actions to increase revenues and to reduce expenses and are considering financing alternatives. In addition, we have entered into an At The Market ("ATM") facility to raise funds, but there can be no assurance that we will be successful in continuing to increase revenues, reduce expenses or securing additional financing to meet our operating needs. The Company's plans with regard to these matters include the following actions: 1) continue second half 2019 progress on improving manufacturing yields and increasing production volumes, 2) continue the Work Status Reduction and continue to reduce discretionary and other expenses, and 3) considering financing and/or strategic alternatives. Based on the Company's current projections and the anticipated availability of the ABL Facility, we estimate we will have sufficient liquidity to fund operations through the fourth quarter of 2020. However, there can be no assurance the Company's plans will be achieved, or that the Company will be able to continue to borrow under its ABL Facility, or secure additional financing and/or pursue strategic alternatives on terms acceptable to us, or at all.

In addition, even if we successfully generate additional funds through the sale of additional equity securities, borrowings or alternative financing, there can be no assurances that the revenue or capital infusion will be sufficient to enable the Company to develop its business to a level where it will be profitable or generate positive cash flow. If we raise additional funds through the issuance of equity or convertible debt securities, the percentage ownership of our stockholders could be significantly diluted, and these newly issued securities may have rights, preferences or privileges senior to those of existing stockholders. If we incur additional debt, a substantial portion of its operating cash flow may be dedicated to the payment of principal and interest on such indebtedness, thus limiting funds available for our operational business activities. The terms of any debt securities issued could also impose significant restrictions on our operations. In addition, broad market and industry factors may seriously harm the market price of our common stock, regardless of its operating performance, and may adversely impact its ability to raise additional funds.

New Technology Development

Our technology development centers on advancing our industry-leading high brightness full-color microdisplays incorporating our color filter and proprietary direct patterning ("dPd") technology. In the fourth quarter of 2019, we developed a significantly higher efficiency (>2X) OLED display compared to our existing OLED-XLS product. This new display is identified as OLED-XLE and is expected to

be qualified as product in 2020. We believe our dPd 2K x 2K displays demonstrate the best combination of high brightness and resolution in the global market today. We have designed these displays to incorporate the attributes that consumer electronics companies demand for their next generation products including variable persistence and global illumination. We view the continued development and demonstration of the advantages of our dPd technology as integral to driving our growth in the enterprise and consumer AR/VR markets, and to accelerate our discussions with mass production partners.

Recent improvements in our manufacturing processes have led to the production of microdisplays with brightness levels that surpass the 5,000 nits threshold requirements of Tier One companies for their AR/VR applications and put us on track to exceed the future brightness levels required by the military. We have developed microdisplays that achieve a measured brightness of 7,500 nits in fiscal 2018 and are targeting a brightness of 10,000 nits in full color by the end of fiscal 2020, consistent with our goal of achieving over 25,000 nits by the end of 2022.

We have also made proprietary architectural improvements and incorporated superior performing OLED materials that have led to demonstrated improvements in the efficiency and lifetime of our displays by more than 50%. In concert with these initiatives, we are upgrading our existing dPd equipment which we expect will significantly extend the lifetime of our dPd displays while improving production yields and volumes. The equipment upgrade is scheduled to be completed during the second quarter of 2020 with lower volume dPd display production commencing in the third quarter of 2020.

New Product Development

We are developing both small pixel and large area microdisplay architectures for wearable consumer applications. These efforts are actively driven by our consumer electronics customers and are aimed at leveraging our dPd technology for cost effective, large volume production systems.

During the third quarter of 2018, we completed the critical design review for a next generation AR/VR microdisplay. The first prototype, a monochrome white version, was completed in the first quarter of 2019 and demonstrated to our customer in May 2019. Completion of the color display, which will use our dPd technology, is expected in the second half of 2020. This display will have very high resolution, high frame rate and other characteristics needed for AR/VR applications.

Year Ended December 31, 2019 Compared to Year Ended December 31, 2018 (dollars in thousands)

Revenues

	Twelve Months Ended December 31,		
	2019	2018	Change
Product	\$ 24,589	\$ 23,322	\$ 1,267
Contract	2,137	2,913	(776)
Total revenue, net	\$ 26,726	\$ 26,235	\$ 491

Revenues increased \$0.5 million to \$26.7 million for the year ended December 31, 2019, from \$26.2 million for the year ended December 31, 2018, representing a 2% increase.

Product revenues are comprised primarily of sales of displays as well as sales of other components. In 2019, product revenues increased \$1.3 million to \$24.6 million for the year ended December 31, 2019 from revenues of \$23.3 million for the year ended December 31, 2018, representing a 5% increase. The increase in product revenues in 2019 was due to customer demand coupled with increase in throughput and manufacturing yields, which resulted in higher quantities of displays shipped at higher average selling prices as compared to fiscal year 2018. Revenues in 2018 were impacted by manufacturing challenges that began in the fourth quarter of 2018, which affected yields and throughput and resulted in lower than planned shipments. These challenges continued during the first six months of 2019 but were resolved in the third quarter, resulting in increased revenues during the last six months of 2019.

Contract revenues are comprised of revenues from research and development, or R&D, and non-recurring engineering or NRE contracts. In 2019, contract revenues decreased \$0.8 million to \$2.1 million for the year ended December 31, 2019 from revenues of \$2.9 million for the year ended December 31, 2018, representing a 27% decrease. The decrease in contract revenues was a result of the completion of several commercial and US Government R&D contracts, in early 2018.

Cost of Revenues

	Twelve Months Ended December 31,		
	2019	2018	Change
Product	\$ 18,775	\$ 17,797	\$ 978
Contract	1,223	1,754	(531)
Impairment of Consumer Night Vision Business inventory	-	2,690	(2,690)
Total cost of revenues	\$ 19,998	\$ 22,241	\$ (2,243)

Total cost of revenues is comprised of costs of product revenues and contract revenues. Cost of product revenue includes materials, labor and manufacturing overhead, warranty costs and depreciation related to our products. Cost of contract revenue includes direct and allocated indirect costs associated with performance on the contracts, primarily engineering resources and materials. Total cost of revenues decreased by \$2.2 million to \$20.0 million for the year ended December 31, 2019 from \$22.2 million for the year ended December 31, 2018. Total cost of revenues in 2018 include a \$2.7 million impairment of consumer night vision business inventory. Excluding the effects of the Consumer Night Vision impairment, total cost of revenues for the year ended December 31, 2019 increased by \$0.4 million compared to the prior year's periods primarily due to increased revenues in 2019.

Total cost of revenues as a percentage of revenues was 75% and 86%, respectively, for the 2019 and 2018 periods. Excluding the impact of the Consumer Night Vision Business impairment, total cost of revenues as a percentage of revenues was relatively consistent as 75% and 75%, respectively, for the 2019 and 2018 periods.

The following table outlines product, contract and total gross profit and related gross margins for the years ended December 31, 2019 and 2018 (dollars in thousands):

	Twelve Months Ended December 31,	
	2019	2018
Product revenues gross profit	\$ 5,814	\$ 5,525
Product revenues gross margin	24 %	24 %
Contract revenues gross profit	\$ 914	\$ 1,159
Contract revenues gross margin	43 %	40 %
Impairment of Consumer Night Vision Business inventory	\$ —	\$ (2,690)
Total gross profit	\$ 6,728	\$ 3,994
Total gross margin	25 %	15 %
Total gross margin excluding the Consumer Night Vision Business Impairment	25 %	25 %

Total gross profit is a function of revenues less cost of revenues. In fiscal 2019, total gross profit increased approximately \$2.7 million or 68% from gross profit of \$4.0 million in fiscal 2018. Total gross margin was 25% for the fiscal year ended December 31, 2019, higher from 15% for the year ended December 31, 2018. The higher gross profit in 2019 was primarily due to \$2.7 million impairment charge related to the discontinuation of the consumer night vision business and the production challenges during and the fourth quarter of fiscal 2018.

Excluding the impairment charge, the total gross profit and gross margin for the year ended December 31, 2019 and 2018 remained flat at \$6.7 million and 25% due to consistent product revenues, production volumes, and yields in fiscal 2019.

Contract gross margin is dependent upon the mix of internal versus external third party costs and materials, with the external third party costs and materials causing a lower gross margin and reducing the contract gross profit. For the year ended December 31, 2019, contract revenue gross profit was \$0.9 million compared to \$1.2 million for the prior year period. The decrease in contract revenue gross profit for the year ended December 31, 2019 was primarily due to decreased contract revenues during 2019.

Operating Expenses

	Twelve Months Ended December 31,		
	2019	2018	Change
Research and development expense	\$ 5,048	\$ 6,694	\$ (1,646)
Percentage of net revenue	19 %	26 %	
Selling, general and administrative expense	\$ 7,251	\$ 8,967	\$ (1,716)
Percentage of net revenue	27 %	34 %	
Total operating expenses	\$ 12,299	\$ 15,661	\$ (3,362)
Percentage of net revenue	46 %	60 %	

Research and Development Expenses

R&D expenses are Company funded and are primarily comprised of salaries and related benefits, development materials and other costs specifically allocated to the development of new microdisplay products, OLED technologies and production processes. Research and development expenses for the year ended December 31, 2019 were \$5.0 million as compared to \$6.7 million for the year ended December 31, 2018, a decrease of \$1.6 million. The decrease in R&D costs during 2019 reflects a focus of production resources on fulfilling customer orders and improving yields and product throughput, and reduced allocations of production costs to R&D categories.

Selling, General and Administrative Expenses

Selling, general and administrative expenses, or SG&A expenses, consist primarily of personnel expenses, professional services fees, as well as other marketing, general corporate and administrative expenses. SG&A expenses for the year ended December 31, 2019 were \$7.3 million as compared to \$9.0 million for the year ended December 31, 2018, a decrease of approximately \$1.7 million. The decrease was primarily due to lower spending on professional services, legal fees and lower travel associated with negotiations with a prospective consumer electronics and volume manufacturer partners. In addition, expenses were also lower due the impact of the Work Status Reduction adopted in October 2019.

Other Income (Expense)

Other income (expense), net primarily consists of changes in the fair value of a warrant liability as well as interest expense and interest income on cash balances. Other income for the year ended December 31, 2019 was \$1.3 million compared to other income of \$2.1 million for the year ended December 31, 2018.

Income related to the change in fair value of warrant liability was \$1.5 million for the year ended December 31, 2019 as compared to \$2.2 million for the year ended December 31, 2018. This non-cash income is associated with the decrease of a liability related to registered warrants issued in May 2017 and January 2018. We are required to revalue warrants classified on our balance sheet as a liability at the end of each reporting period and reflect a gain or loss from the change in fair value in the period in which the change occurred. We calculate the fair value of the warrants outstanding using the Black-Scholes model.

Other income for the year December 31, 2019 reflects net interest expense of \$0.2 million as compared to net interest expense of \$0.1 million for the year ended December 31, 2018. These amounts represent interest expense on our borrowing under our ABL Facility.

Income Tax Expense (Benefit)

For the years ended December 31, 2019 and 2018, we had no income tax expense. We have a full valuation allowance as The Company recognizes the effect of income tax positions, which are more-likely-than-not of being sustained. We have determined that it was not likely that we will generate sufficient future taxable income to realize the deferred tax assets.

Net Loss

As a result of the above, net loss was approximately \$4.3 million and \$9.5 million for the fiscal years ended December 31, 2019 and 2018, respectively.

Off-Balance Sheet Arrangements

We have no off-balance sheet arrangements that are expected to have a current or future effect on our financial condition, revenues, results of operations, liquidity or capital expenditures.

Liquidity and Capital Resources

As of December 31, 2019, we had \$3.5 million of cash, cash equivalents, and investments as compared to \$3.4 million at December 31, 2018. The \$0.2 million increase in cash was primarily due to cash used in operating activities of \$5.1 million and investing activities of \$1.1 million, offset by cash provided by financing activities of \$6.4 million.

For the year ended December 31, 2019, cash used by operating activities were \$5.1 million, which was attributable to our net loss of \$4.3 million and changes in operating assets and liabilities of \$2.4 million partially offset by net non-cash expenses of \$1.6 million. For the year ended December 31, 2018, cash used by operating activities were \$6.4 million, which was primarily attributable to our net loss of \$9.5 million and the effect of net non-cash expenses and changes in operating assets and liabilities.

For the years ended December 31, 2019 and 2018, cash used by investing activities were \$1.1 million and \$2.3 million, respectively, primarily due to less equipment purchases for upgrading and expanding the capacity of our production line during 2019.

For the year ended December 31, 2019, cash provided by financing activities were \$6.4 million of which \$3.5 million were from the net proceeds from a public offering and associated private placement of our common stock and \$2.9 million in net borrowings under our ABL Facility. For the year ended December 31, 2018, cash provided by financing activities were \$8.5 million of which \$12.1 million were from the net proceeds from a public offering and associated private placement of our common stock and \$0.1 million from the exercise of stock options and warrants. In addition, these amounts were partially offset by the repayment of \$3.8 million in borrowings under our ABL Facility.

Going Concern

For the year ended December 31, 2019, we incurred a net loss of \$4.3 million and used cash in operating activities of \$5.1 million. At December 31, 2019, we had cash and cash equivalents of \$3.5 million, net working capital of \$8.8 million, \$2.9 million of debt outstanding under our ABL Facility and borrowing availability of \$1.2 million.

Due to continuing losses, our financial position, and uncertainty regarding our ability to borrow under the ABL Facility, we may not be able to meet our financial obligations as they become due without additional financing or sources of capital. Management is prepared to reduce expenses and raise additional capital, but there can be no assurance that we will be successful in sufficiently reducing expenses or raising capital to meet its operating needs. In October 2019, senior management work status was reduced by approximately 20%.

Our ABL Facility expires on December 31, 2020 and, while relations with the lender are positive, there is no assurance the lender will renew or extend this facility, or continue to make funds available during 2020 and beyond at present availability levels, or at all. Therefore, in accordance with applicable accounting guidance, and based on our current financial condition and availability of funds, there is substantial doubt about our ability to continue as a going concern through March 31, 2021.

Based on our current projections and the availability of the ABL Facility, we estimate we will have sufficient liquidity through the end of the fourth quarter of 2020. However, there can be no assurance projected results will be achieved or funds will be available under our ABL Facility. If actual results are less than projected or additional needs for liquidity arise, we may be able to raise additional debt or equity financing and is prepared to reduce expenses or enter into a strategic transaction. However, we can make no assurance that we will be able to reduce expenses sufficiently, raise additional capital, or enter into a strategic transaction on terms acceptable to us, or at all.

Underwritten Public Offerings

On January 29, 2018, we completed an underwritten offering of 9,807,105 shares of our common stock together with warrants to purchase 3,922,842 shares of our common stock with an exercise price of \$1.55 per share and a five-year term. (at a public offering price of \$1.35 per fixed combination consisting of one share of Common Stock and associated warrant to purchase four-tenths of one share of Common Stock). We received net proceeds after underwriting discounts and expenses of approximately \$11.9 million.

In a concurrent private placement, certain of our directors and officers purchased an aggregate of 203,708 shares of Common Stock, together with warrants to purchase up to 81,487 shares of Common Stock at the public offering price per fixed combination. The sale of these shares of common stock and warrants was not registered under the Securities Act and is subject to a 180-day lock-up. The private placement closed on February 15, 2018, and the Company received net proceeds of \$0.3 million.

On November 22, 2019, we have entered into an At the Market ("ATM") offering agreement with H.C. Wainwright & Co., LLC, ("Wainwright") relating to shares of our common stock. In accordance with the terms of the sales agreement, we may offer and sell up to 5,000,000 shares of our common stock having an aggregate offering price of up to \$1.7 million from time to time through Wainwright acting as our sales agent. Wainwright will be entitled to compensation at a fixed commission rate equal to 3.0% of the gross proceeds per share sold under the sales agreement. We intend to use the net proceeds from this offering to fund working capital requirements and for other general corporate purposes.

ABL Facility

On December 21, 2016, we entered into an ABL Facility with a lender that provides for up to a maximum amount of \$5 million based on a borrowing base equivalent of 85% of eligible accounts receivable plus the lesser of \$2 million or 50% of eligible inventory. The interest on the ABL Facility is equal to the Prime Rate plus 3% but may not be less than 6.5% with a minimum monthly interest payment of \$2,000. We are obligated to pay the lender a monthly administrative fee of \$1,000 and an annual facility fee equal to 1% of the maximum amount borrowable under the facility. The ABL Facility will automatically renew on December 31, 2020 for a one-year term unless written notice to terminate the Financing Agreement is provided by either party.

The ABL Facility is secured by a lien on all receivables, property and the proceeds thereof, credit insurance policies and other insurance relating to the collateral, books, records and other general intangibles, inventory and equipment, proceeds of the collateral and accounts, instruments, chattel paper, and documents. The ABL Facility contains customary representations and warranties, affirmative and negative covenants and events of default, including a provision that we maintain a minimum tangible net worth of \$13 million and a minimum working capital balance of \$4 million. As of December 31, 2019, there were \$2.9 million net borrowings outstanding under the Financing Agreement, the interest rate was 7.75% and had unused borrowing availability of \$1.2 million. We were in compliance with all financial debt covenants as of December 31, 2019.

Change in Control Agreements

The Company entered into change in control agreements with certain of its executive officers, non-executive officers and managers. The agreements specify various employment-related matters, including annual compensation, performance incentive bonuses, and severance benefits in the event of termination with or without cause.

Dividends

In the years ended December 31, 2019 and 2018, no dividends were declared or paid. It is our intention to retain any future profits for use in the development and expansion of our business and for general corporate purposes. Future decisions to pay cash dividends are at the discretion of our Board of Directors.

Contractual Obligations

The following chart describes our outstanding contractual obligations as of December 31, 2019 (in thousands):

	Payments Due by Period				
	Total	1 Year	2-3 Years	4-5 Years	Thereafter
Operating lease obligations	\$ 4,579	\$ 1,063	\$ 2,068	\$ 1,448	\$ -
Finance lease obligations	46	20	26	-	-
ABL Facility (a)	2,954	2,954	-	-	-
Equipment purchase obligations	272	272	-	-	-
Purchase obligations (b)	3,264	3,264	-	-	-
Total	\$ 11,115	\$ 7,573	\$ 2,094	\$ 1,448	\$ -

(a) The Company's ABL Facility matures in 2020 and is classified as a current liability. Amount includes annual renewal fee.

(b) The majority of purchase orders outstanding contain no cancellation fees except for minor re-stocking fees or reimbursements due to contract manufacturers for components purchased in anticipation of a scheduled production run that are subsequently cancelled.

Critical Accounting Policies

The SEC defines "critical accounting policies" as those that require application of management's most difficult, subjective or complex judgments, often as a result of the need to make estimates about the effect of matters that are inherently uncertain and may change in subsequent periods. Not all of the accounting policies require management to make difficult, subjective or complex judgments or estimates. However, the following policies could be deemed to be critical within the SEC definition.

Revenue and Cost Recognition

All of our revenues are earned from contracts with customers and are classified as either Product or Contract revenues. Contracts include written agreements and purchase orders, as well as arrangements that are implied by customary practices or law.

Product revenue is generated primarily from contracts to produce, ship and deliver OLED microdisplays. Our performance obligations are satisfied, control of our products is transferred, and revenue is recognized at a single point in time when control transfers to our customer for product shipped. Our customary terms are FOB our factory and control is deemed to transfer upon shipment. Shipping and other transportation costs charged to customers are treated as fulfillment activities and are recorded in both revenue and cost of sales at the time control is transferred to the customer. As customers are invoiced at the time control transfers and the right to consideration is unconditional at that time, we do not maintain contract asset balances for product revenue. Additionally, we do not maintain contract liability balances for product revenues, as performance obligations are satisfied prior to customer payment for product. We offer generally a one-year product warranty, for replacement of product only, and do not allow returns. We offer industry standard payment terms that typically require payment from our customers from 30 to 60 days after title transfer.

We also recognize revenues under the over-time method from certain R&D activities (contract revenues) under both firm fixed-price contracts and cost-type contracts. Progress and revenues from research and development activities relating to firm fixed-price contracts and cost-type contracts are generally recognized on an input method of accounting as costs are incurred. Under the input method, revenue is recognized based on efforts expended to date (e.g., the costs of resources consumed or labor hours worked, or machine hours used) relative to total efforts intended to be expended. Contract costs include all direct material, labor and subcontractor costs and an allocation of allowable indirect costs as defined by each contract, as periodically adjusted to reflect revised agreed upon rates. These rates are subject to audit by the other party. Any changes in estimate related to contract accounting are accounted for prospectively over the remaining life of the contract. Under the over-time method, billings may not correlate directly to the revenue recognized. Based upon the terms of the specific contract, billings may be in excess of the revenue recognized, in which case the amounts are included in deferred revenues as a liability on the Consolidated Balance Sheets. Likewise, revenue recognized may exceed customer billings in which case the amounts are reported as unbilled receivables. Unbilled revenues are expected to be billed and collected within one year. The incidental costs related to obtaining product sales contracts are non-recoverable from customers; and accordingly, are expensed as incurred.

Product Warranty

We offer generally a one-year product replacement warranty. In general, our standard policy is to repair or replace the defective products. We accrue for estimated returns of defective products at the time revenue is recognized based on historical activity as well as for specific known product issues. The determination of these accruals requires us to make estimates of the frequency and extent of warranty activity and estimate future costs to replace the products under warranty. If the actual warranty activity and/or repair and replacement costs differ

significantly from these estimates, adjustments to cost of revenue may be required in future periods.

Inventory Valuation

Inventories are stated on a standard cost basis adjusted to approximate the lower of cost (as determined by the first-in, first-out method) or net realizable value. Cost includes materials, labor, and manufacturing overhead related to the production of OLED displays. The standard cost for the Company's products are subject to fluctuation from quarter to quarter, depending primarily on the number of displays produced, fluctuations in manufacturing overhead and labor hours incurred, and the yields experienced in the manufacturing process. The Company regularly reviews inventory quantities on hand, future purchase commitments with the Company's suppliers, and the estimated utility of the inventory. If the Company review indicates a reduction in utility below carrying value, the inventory is reduced to a new cost basis.

Fair Value of Financial Instruments

Our cash, cash equivalents, accounts receivable, short-term investments, accounts payable are stated at cost which approximates fair value due to the short-term nature of these instruments. The fair value of our ABL Facility approximates our carrying value because the interest rate moves with a market based rate plus a margin. The fair value of the liability for common stock purchase warrants is estimated using the Black Scholes option pricing model based on the market value of the underlying common stock at the measurement date, the contractual term of the warrant, risk-free interest rates, expected dividends and expected volatility of the price of the underlying common stock.

Stock-based Compensation

We account for the measurement and recognition of compensation expense for all share-based payment awards made to employees and directors by estimating the fair value of stock awards at the date of grant using the Black-Scholes option valuation model. Stock-based compensation expense is reduced for estimated forfeitures and is amortized over the vesting period using the straight-line method. See Note 14 of the Consolidated Financial Statements- Stock Compensation for a further discussion on stock-based compensation.

Derivative Financial Instruments

We evaluate all of our financial instruments, including issued stock purchase warrants, to determine if such instruments are derivatives or contain features qualifying as embedded derivatives. For derivative financial instruments accounted for as liabilities, the derivative instrument is initially recorded at its fair value and is then re-valued at each reporting date, with changes in the fair value reported in the consolidated statement of operations. We use the Black-Scholes option-pricing model to value the derivative instruments at inception and subsequent valuation dates. The classification of derivative instruments, including whether such instruments should be recorded as liabilities or as equity, is re-assessed at the end of each reporting period. We do not use derivative instruments to hedge exposures to cash flow, market, or foreign currency risks.

Effect of Recently Issued Accounting Pronouncements

See Note 2 of the Consolidated Financial Statements in Item 8 for a full description of recent accounting pronouncements, including the expected dates of adoption and estimated effects on results of operations and financial condition.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Market risk is the risk of loss to future earnings, values or cash flows that may result from changes in the price of a financial instrument. The fair value of a financial instrument, derivative or non-derivative, might change as a result of changes in interest rates, exchange rates, commodity prices, equity prices and other market changes. We have operations internationally and we are exposed to market risks in the ordinary course of our business. These risks include interest rate and foreign currency exchange rate risks.

Interest rate risk

We hold our cash in cash and cash equivalents and certificates of deposits. We do not hold derivative financial instruments or equity securities. At December 31, 2019, we had borrowings of \$2.9 million under our revolving line of credit. A hypothetical 10% increase in borrowing interest rates would have had a material effect on our consolidated financial position, results of operations, or cash flows in the year ended December 31, 2019.

Foreign currency exchange rate risk

We do not have any material foreign currency exchange rate risk because the majority of our transactions are denominated in US dollars.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The report of the independent registered public accounting firm and financial statements are included in Item 15 of this Annual Report on Form 10-K.

None.

ITEM 9A. CONTROLS AND PROCEDURES

(a) Evaluation of Disclosure Controls and Procedures

Our management, with the participation of the principal executive and principal financial officers, have evaluated the effectiveness of our disclosure controls and procedures, as defined in Rules 13a – 15(e) and 15d – 15(e) under the Securities Exchange Act of 1934, as amended, or Exchange Act, as of the end of the period covered by this Annual Report. They have concluded that, based on such evaluation, our disclosure controls and procedures were effective as of December 31, 2019.

(b) Management's Annual Report on Internal Control Over Financial Reporting

Overview

Internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) refers to the process designed by, or under the supervision of, our principal executive officer and principal financial officer, and effected by our board of directors, management and other personnel, 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 in the United States of America. Management is responsible for establishing and maintaining adequate internal control over financial reporting for eMagin.

Internal control over financial reporting cannot provide absolute assurance of achieving financial reporting objectives because of its inherent limitations. Internal control over financial reporting is a process that involves human diligence and compliance and is subject to lapses in judgment and breakdowns resulting from human failures. Internal control over financial reporting also can be circumvented by collusion or improper management override. Because of such limitations, there is a risk that material misstatements may not be prevented or detected on a timely basis by internal control over financial reporting. However, these inherent limitations are known features of the financial reporting process. Therefore, it is possible to design into the process safeguards to reduce, though not eliminate, this risk.

Management has used the framework set forth in the report entitled "Internal Control -- Integrated Framework (2013)" published by the Committee of Sponsoring Organizations of the Treadway Commission to evaluate the effectiveness of eMagin's internal control over financial reporting. A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting such that there is a reasonable possibility that a material misstatement of our annual or interim financial statements will not be prevented or detected on a timely basis.

Management's Assessment

As of December 31, 2019, our management has assessed the effectiveness of our internal control over financial reporting and has determined that our internal control over financial reporting was effective.

(c) Changes in Internal Control over Financial Reporting

There have been no changes in our internal control over financial reporting that occurred during our last fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. These conclusions were communicated to the Audit Committee.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this Item will be incorporated herein by reference from the sections captioned "Election of Directors", "Executive Officers" and "Section 16(a) Beneficial Ownership Reporting Compliance" in our proxy statement to be issued in connection with the Annual General Meeting of Shareholders to be held on June 4, 2020, which will be filed with the SEC within 120 days after the end of our fiscal year ended December 31, 2019 (the "2020 Proxy Statement").

ITEM 11. EXECUTIVE COMPENSATION

The information required by this Item will be incorporated herein by reference from the sections captioned "Compensation of Directors", "Elements of Executive Compensation", "Summary Compensation Table", and "Outstanding Equity Awards Table" in the 2020 Proxy Statement.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this Item will be incorporated herein by reference in the 2020 Proxy Statement.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this Item will be incorporated herein by reference from the sections captioned "Transaction with Related Persons" in the 2020 Proxy Statement.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The information required by this Item will be incorporated herein by reference from the section captioned "Audit Fees" in the 2020 Proxy Statement.

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES**(a) Financial Statements and Schedules****1. Financial Statements**

The following consolidated financial statements are filed as part of this report under Item 8 of Part II "Financial Statements and Supplementary Data:

- F-2 Consolidated Balance Sheets at December 31, 2019 and 2018.
- F-3 Consolidated Statements of Operations for the Years Ended December 31, 2019 and 2018.
- F-4 Consolidated Statements of Changes in Shareholders' Equity for the Years Ended December 31, 2019 and 2018.
- F-5 Consolidated Statements of Cash Flows for the Years Ended December 31, 2019 and 2018.
- F-6 Notes to the Consolidated Financial Statements

2. Financial Statement Schedules

Financial statement schedules not included herein have been omitted because they are either not required, not applicable, or the information is otherwise included herein.

3. Exhibits

The following exhibits are filed or incorporated by reference as part of this Annual Report on Form 10-K.

Exhibit Number	Description
<u>2.1</u>	<u>Agreement and Plan of Merger between Fashion Dynamics Corp., FED Capital Acquisition Corporation and FED Corporation dated March 13, 2000 (incorporated by reference to exhibit 2.1 to the Registrant's Current Report on Form 8-K/A filed on March 17, 2000).</u>
<u>3.1</u>	<u>Amended and Restated Certificate of Incorporation (incorporated by reference to an appendix to the Registrant's Definitive Proxy Statement filed on September 21, 2006).</u>
<u>3.2</u>	<u>Certificate of Amendment of Amended and Restated Certificate of Incorporation (incorporated by reference to an appendix to the Registrant's Definitive Proxy Statement filed on October 26, 2010).</u>
<u>3.3</u>	<u>Bylaws of the Registrant (incorporated by reference to exhibit 99.3 to the Registrant's Definitive Proxy Statement filed on June 14, 2001).</u>
<u>3.4</u>	<u>Certificate of Designations of Series B Convertible Preferred Stock (incorporated by reference to Exhibit 4.2 of the Registrant's current report on Form 8-K filed on December 23, 2008).</u>
<u>4.1</u>	<u>Form of Common Stock Purchase Warrant (incorporated by reference to Exhibit 4.1 to the Registrant's current report on Form 8-K filed on December 23, 2008).</u>
<u>4.2</u>	<u>Form of Common Stock Purchase Warrant (incorporated by reference to Exhibit 4.1 to the Registrant's current report on Form 8-K filed on December 18, 2015).</u>
<u>4.3</u>	<u>Form of Letter Agreement (incorporated by reference to exhibit 4.1 of the Registrant's Current Report on Form 8-K filed on August 24, 2016).</u>
<u>4.4</u>	<u>Form of Common Stock Purchase Warrant (incorporated by reference to exhibit 4.2 of the Registrant's Current Report on Form 8-K filed on August 24, 2016).</u>
<u>4.5</u>	<u>Form of Common Stock Purchase Warrant (incorporated by reference to exhibit 4.1 of the Registrant's Current Report on Form 8-K filed on April 8, 2019).</u>
<u>4.6</u>	<u>Form of Pre-Funded Common Stock Purchase Warrant (incorporated by reference to exhibit 4.1 of the Registrant's Current Report on Form 8-K filed on April 12, 2019).</u>
<u>4.7</u>	<u>Form of Common Stock Purchase Warrant (incorporated by reference to exhibit 4.2 of the Registrant's Current Report on Form 8-K filed on April 12, 2019).</u>
<u>4.8</u>	<u>Description of Registrants Securities</u>
<u>10.1</u>	<u>Lease between International Business Machines Corporation ("IBM") and FED Corporation dated May 28, 1999 (incorporated by reference to exhibit 10.9 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2000 filed on March 30, 2001).</u>
<u>10.2</u>	<u>Securities Purchase Agreement, dated December 18, 2008 (incorporated by reference to exhibit 99.1 of the Registrant's Current Report on Form 8-K filed on December 23, 2008).</u>
<u>10.3</u>	<u>Registration Rights Agreement, dated December 18, 2008 (incorporated by reference to exhibit 99.2 of the Registrant's Current Report on Form 8-K filed on December 23, 2008).</u>
<u>10.4</u>	<u>Exchange Agreement, dated December 18, 2008 (incorporated by reference to exhibit 99.3 of the Registrant's Current Report on Form 8-K filed on December 23, 2008).</u>
<u>10.5</u>	<u>2011 Incentive Stock Plan (incorporated by reference to exhibit 99.1 of the Registrant's Current Report on Form 8-K filed on November 8, 2011).*</u>
<u>10.6</u>	<u>2013 Incentive Stock Plan, filed April 2, 2013, as filed in the Registrant's Definitive Proxy Statement incorporated herein by reference.*</u>

<u>10.7</u>	<u>Securities Purchase Agreement, dated as of December 17, 2015 (incorporated by reference to exhibit 10.1 of the Registrant's Current Report on Form 8-K filed on December 18, 2015).</u>
<u>10.8</u>	<u>Placement Agency Agreement, dated as of December 17, 2015 (incorporated by reference to exhibit 10.2 of the Registrant's Current Report on Form 8-K filed on December 18, 2015).</u>
<u>10.9</u>	<u>8th Lease Amendment between International Global Foundries U.S. 2 LLC and eMagin Corporation, effective as of March 21, 2016 (incorporated by reference to exhibit 99.1 of the Registrant's Current Report on Form 8-K filed on May 9, 2016).</u>
<u>10.10</u>	<u>Executive Employment Agreement, dated as of July 1, 2016, by and between the Company and Andrew G. Sculley, Jr. (incorporated by reference to exhibit 99.1 of the Registrant's Current Report on Form 8-K filed on July 7, 2016).</u>
<u>10.11</u>	<u>Financing Agreement, dated as of March 24, 2017, by and between the Company and Rosenthal & Rosenthal, Inc. (incorporated by reference to exhibit 10.31 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2016 filed on March 29, 2017).</u>
<u>10.12</u>	<u>Form of Strategic Bonus Agreement (incorporated by reference to exhibit 10.2 to the Company's Annual Report on form 10-K/A for the year ended December 31, 2018 filed on April 30, 2019).</u>
<u>10.13</u>	<u>Form of Amended and Restated Change in Control Agreement (incorporated by reference to exhibit 10.1 to the Company's Current Report on Form 8-K filed on October 18, 2019).</u>
<u>10.14</u>	<u>Form of Amended and Restated Strategic Bonus Agreement (incorporated by reference to exhibit 10.2 to the Company's Current Report on Form 8-K filed on October 18, 2019).</u>
<u>10.15</u>	<u>At Market Offering Agreement, between eMagin Corporation and H.C. Wainwright & Co., LLC (incorporated by reference to exhibit 10.1 to the Company's Current Report on Form 8-K filed on November 22, 2019).</u>
<u>10.16</u>	<u>2019 Employee and Consultant Stock Option and Incentive Plan filed December 5, 2019, as filed in the registrant's Definitive Proxy Statement incorporated herein by reference.*</u>
<u>10.17</u>	<u>2019 Non-Employee Director Stock Option and Incentive Plan filed December 5, 2019, as filed in the Registrant's Definitive Proxy Statement incorporated herein by reference.*</u>
<u>21.1</u>	<u>Subsidiaries of the Company (filed herewith).</u>
<u>23.1</u>	<u>Consent of Independent Registered Public Accounting Firm (filed herewith).</u>
<u>31.1</u>	<u>Certification by Chief Executive Officer pursuant to Sarbanes Oxley Section 302 (filed herewith).</u>
<u>31.2</u>	<u>Certification by Chief Financial Officer pursuant to Sarbanes Oxley Section 302 (filed herewith).</u>
<u>32.1</u>	<u>Certification by Chief Executive Officer pursuant to 18 U.S.C. Section 1350 furnished herewith).</u>
<u>32.2</u>	<u>Certification by Chief Financial Officer pursuant to 18 U.S.C. Section 1350 (furnished herewith).</u>
101.INS	XBRL Instance Document (filed herewith).
101.SCH	XBRL Taxonomy Extension Schema Document (filed herewith).
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document (filed herewith).
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document (filed herewith).
101.LAB	XBRL Taxonomy Extension Label Linkbase Document (filed herewith).
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document (filed herewith).
* Each of the Exhibits noted by an asterisk is a management compensatory plan or arrangement.	

SIGNATURES

In accordance with Section 13 or 15(d) of the Exchange Act, the registrant caused this report to be signed on its behalf by the undersigned, thereunto duly authorized on this 11th day of March 2020.

eMAGIN CORPORATION

By: /s/ Andrew G. Sculley
Andrew G. Sculley
Chief Executive Officer

In accordance with the Exchange Act, this report has been signed below by the following persons on March 11, 2020, on behalf of the registrant and in the capacities indicated.

<u>Signature</u>	<u>Title</u>
<u>/s/ Andrew G. Sculley</u> Andrew G. Sculley	Chief Executive Officer, Director (Principal Executive Officer)
<u>/s/ Mark A. Koch</u> Mark A. Koch	Acting Chief Financial Officer (Chief Accounting Officer and Principal Financial Officer)
<u>/s/ Jill J. Wittels</u> Jill J. Wittels	Chair of the Board
<u>/s/ Ellen Richstone</u> Ellen Richstone	Director
<u>/s/ Paul Cronson</u> Paul Cronson	Director
<u>/s/ Eric Braddom</u> Eric Braddom	Director
<u>/s/ Stephen Seay</u> Stephen Seay	Director

To the Shareholders and the Board of Directors of eMagin Corporation

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of eMagin Corporation and its subsidiary (the Company) as of December 31, 2019 and 2018, the related consolidated statements of operations, changes in shareholders' equity and cash flows for the years then ended, and the related notes to the consolidated financial statements (collectively, the financial statements). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for the years then ended, in conformity with accounting principles generally accepted in the United States of America.

Emphasis of Matter Regarding Going Concern

The accompanying financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 2 to the financial statements, the Company has recurring negative cash flows from operations, has suffered recurring losses from operations and there is uncertainty regarding the Company's ability to borrow under its asset based lending facility. This raises substantial doubt about the Company's ability to continue as a going concern. Management's plans in regard to these matters also are described in Note 2. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Change in Accounting Principle

As discussed in Note 2 to the financial statements, the Company has changed its method of accounting for leases as of January 1, 2019 due to the adoption of Accounting Standards Codification Topic 842, *Leases*.

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 Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with 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. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

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.

/s/ RSM US LLP

We have served as the Company's auditor since 2011.

Stamford, Connecticut
March 11, 2020

eMAGIN CORPORATION
CONSOLIDATED BALANCE SHEETS
(In thousands, except share and per share data)

	December 31, 2019	December 31, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 3,515	\$ 3,359
Accounts receivable, net	3,966	3,186
Unbilled accounts receivable	155	224
Inventories	8,832	8,582
Prepaid expenses and other current assets	1,130	875
Total current assets	17,598	16,226
Equipment, furniture and leasehold improvements, net	8,100	8,921
Operating lease right - of - use assets	3,729	—
Intangibles and other assets	160	269
Total assets	\$ 29,587	\$ 25,416
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 1,302	\$ 2,024
Accrued compensation	1,778	1,634
Revolving credit facility, net	2,891	—
Common stock warrant liability	23	1,497
Other accrued expenses	1,401	1,827
Deferred revenue	277	38
Operating lease liability - current	775	—
Other current liabilities	342	427
Total current liabilities	8,789	7,447
Finance lease liability - long term	24	—
Operating lease liability - long term	3,067	—
Total liabilities	11,880	7,447
Commitments and contingencies (Note 9)		
Shareholders' equity:		
Preferred stock, \$.001 par value: authorized 10,000,000 shares:		
Series B Convertible Preferred stock, (liquidation preference of \$5,659) stated value \$1,000 per share, \$.001 par value: 10,000 shares designated and 5,659 issued and outstanding as of December 31, 2019 and 2018.		
	—	—
Common stock, \$.001 par value: authorized 200,000,000 shares, issued 50,250,378 shares, outstanding 50,088,312 shares as of December 31, 2019 and issued 45,323,339 shares, outstanding 45,161,273 shares as of December 31, 2018.		
	50	45
Additional paid-in capital	258,767	254,736
Accumulated deficit	(240,610)	(236,312)
Treasury stock, 162,066 shares as of December 31, 2019 and 2018.	(500)	(500)
Total shareholders' equity	17,707	17,969
Total liabilities and shareholders' equity	\$ 29,587	\$ 25,416

See notes to Consolidated Financial Statements.

eMAGIN CORPORATION
CONSOLIDATED STATEMENTS OF OPERATIONS
(In thousands, except share and per share data)

	Twelve Months Ended December 31,	
	2019	2018
Revenues:		
Product	\$ 24,589	\$ 23,322
Contract	2,137	2,913
Total revenues, net	26,726	26,235
Cost of revenues:		
Product	18,775	17,797
Contract	1,223	1,754
Impairment of Consumer Night Vision Business inventory	—	2,690
Total cost of revenues	19,998	22,241
Gross profit	6,728	3,994
Operating expenses:		
Research and development	5,048	6,694
Selling, general and administrative	7,251	8,967
Total operating expenses	12,299	15,661
Loss from operations	(5,571)	(11,667)
Other income (expense):		
Change in fair value of common stock warrant liability	1,474	2,194
Interest expense, net	(201)	(69)
Total other income	1,273	2,125
Loss before provision for income taxes	(4,298)	(9,542)
Income taxes	—	—
Net loss	\$ (4,298)	\$ (9,542)
Loss per share, basic	\$ (0.09)	\$ (0.21)
Loss per share, diluted	\$ (0.09)	\$ (0.21)
Weighted average number of shares outstanding:		
Basic	48,132,714	44,429,114
Diluted	48,132,714	44,429,114

See notes to Consolidated Financial Statements.

eMAGIN CORPORATION
CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY
(In thousands, except share data)

	Preferred Shares	Preferred Stock	Common Shares	Common Stock	Additional Paid-in Capital	Accumulated Deficit	Treasury Stock	Total Shareholders' Equity
Balance, December 31, 2017	5,659	\$ —	35,182,589	\$ 35	\$ 244,726	\$ (226,770)	\$ (500)	\$ 17,491
Exercise of common stock options	—	—	99,937	—	98	—	—	98
Exercise of common stock warrants	—	—	30,000	—	46	—	—	46
Public offering of common shares, net of offering costs	—	—	10,010,813	10	9,256	—	—	9,266
Stock based compensation	—	—	—	—	610	—	—	610
Net loss	—	—	—	—	—	(9,542)	—	(9,542)
Balance, December 31, 2018	5,659	\$ —	45,323,339	\$ 45	\$ 254,736	\$ (236,312)	\$ (500)	\$ 17,969
Exercise of common stock options	—	—	12,500	—	9	—	—	9
Public offering of common shares, net of offering costs	—	—	4,914,539	5	3,471	—	—	3,476
Stock based compensation	—	—	—	—	551	—	—	551
Net loss	—	—	—	—	—	(4,298)	—	(4,298)
Balance, December 31, 2019	5,659	\$ —	50,250,378	\$ 50	\$ 258,767	\$ (240,610)	\$ (500)	\$ 17,707

See notes to Consolidated Financial Statements.

eMAGIN CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Twelve Months Ended	
	December 31,	
	2019	2018
Cash flows from operating activities:		
Net loss	\$ (4,298)	\$ (9,542)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	2,046	1,989
Change in fair value of common stock warrant liability	(1,474)	(2,194)
Impairment of Consumer Night Vision Business inventory	—	1,270
Impairment of Consumer Night Vision Business tooling	—	76
Stock-based compensation	551	610
Amortization of operating lease right-of-use assets	538	—
Changes in operating assets and liabilities:		
Accounts receivable	(780)	1,342
Unbilled accounts receivable	69	183
Inventories	(250)	(2,632)
Prepaid expenses and other current assets	(255)	453
Deferred revenues	239	(727)
Operating lease liabilities	(530)	—
Accounts payable, accrued expenses, and other current liabilities	(966)	2,793
Net cash used in operating activities	(5,110)	(6,379)
Cash flows from investing activities:		
Purchase of equipment	(1,110)	(2,296)
Net cash used in investing activities	(1,110)	(2,296)
Cash flows from financing activities:		
Borrowings (repayments) under revolving line of credit, net	2,891	(3,808)
Proceeds from public offering, net	3,476	12,172
Proceeds from warrant exercise, net	—	46
Proceeds from exercise of stock options	9	98
Net cash provided by financing activities	6,376	8,508
Net increase (decrease) in cash and cash equivalents	156	(167)
Cash and cash equivalents, beginning of period	3,359	3,526
Cash and cash equivalents, end of period	\$ 3,515	\$ 3,359
Cash paid for interest	\$ 177	\$ 106
Cash paid for income taxes	\$ —	\$ —

See notes to Consolidated Financial Statements.

Note 1 – Nature Of Business

eMagin Corporation and its wholly owned subsidiary, Virtual Vision, Inc. (the “Company”), designs, manufactures and supplies OLED-on-silicon microdisplays and virtual imaging products which utilize OLED microdisplays. The Company’s products are sold mainly in North America, Asia, and Europe.

Note 2 – Significant Accounting Policies

Basis of Presentation

The accompanying consolidated financial statements include the accounts of eMagin Corporation and its wholly owned subsidiary. All intercompany transactions have been eliminated in consolidation. The Company manages its operations on a consolidated, integrated basis in order to optimize its equipment and facilities and to effectively service its global customer base, and concludes that it operates in a single business segment.

Use of Estimates

In accordance with accounting principles generally accepted in the United States of America, management utilizes certain estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. On an on-going basis, management evaluates its estimates and judgments related to, among others, allowance for doubtful accounts, warranty reserves, inventory reserves, stock-based compensation expense, deferred tax asset valuation allowances, litigation and other loss contingencies. Management bases its estimates and judgments on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results could differ from those estimates.

Revenue and Cost Recognition

All of the Company’s revenues are earned from contracts with customers and are classified as either Product or Contract revenues. Contracts include written agreements and purchase orders, as well as arrangements that are implied by customary practices or law.

Product revenue is generated primarily from contracts to produce, ship and deliver OLED microdisplays. eMagin’s performance obligations are satisfied, control of our products is transferred, and revenue is recognized at a single point in time when control transfers to our customer for product shipped. Our customary terms are FOB our factory and control is deemed to transfer upon shipment. The Company has elected to treat shipping and other transportation costs charged to customers as fulfillment activities and are recorded in both revenue and cost of sales at the time control is transferred to the customer. As customers are invoiced at the time control transfers and the right to consideration is unconditional at that time, the Company does not maintain contract asset balances for product revenue. Additionally, the Company does not maintain contract liability balances for product revenues, as performance obligations are satisfied prior to customer payment for product. The Company offers a one-year product warranty, for replacement of product only, and does not allow returns. The Company offers industry standard payment terms that typically require payment from our customers from 30 to 60 days after title transfers.

The Company also recognizes revenues under the over time method from certain research and development (“R&D”) activities (contract revenues) under both firm fixed-price contracts and cost-type contracts. Progress and revenues from research and development activities relating to firm fixed-price contracts and cost-type contracts are generally recognized on an input method of accounting as costs are incurred. Under the input method, revenue is recognized based on efforts expended to date (e.g., the costs of resources consumed or labor hours worked, or machine hours used) relative to total efforts intended to be expended. Contract costs include all direct material, labor and subcontractor costs and an allocation of allowable indirect costs as defined by each contract, as periodically adjusted to reflect revised agreed upon rates. These rates are subject to audit by the other party. Any changes in estimate related to contract accounting are accounted for prospectively over the remaining life of the contract. Under the over time method, billings may not correlate directly to the revenue recognized. Based upon the terms of the specific contract, billings may be in excess of the revenue recognized, in which case the amounts are included in deferred revenues as a liability on the Consolidated Balance Sheets. Likewise, revenue recognized may exceed customer billings in which case the amounts are reported as unbilled receivables. Unbilled revenues are expected to be billed and collected within one year. The incidental costs related to obtaining product sales contracts are non-recoverable from customers; and accordingly, are expensed as incurred.

The Company adopted the provisions of ASC No. 606, *Revenue from Contracts with Customers*, and related amendments ("ASC 606") on January 1, 2018 using the modified retrospective adoption method with the cumulative effect of initially applying the guidance recognized at the date of initial application. During 2017, the Company analyzed its revenue recognition policies under ASC 606 and then current revenue recognition policies and determined that the performance obligations, transaction price, allocation of transaction price, recognition of contract costs and timing of revenue recognition would not be materially impacted by adopting ASC 606. Accordingly, there was no modified retrospective adoption adjustment necessary as of January 1, 2018.

Product Warranty

The Company offers a one-year product replacement warranty. The standard policy is to repair or replace the defective products. The Company accrues for estimated returns of defective products at the time revenue is recognized based on historical activity as well as for specific known product issues. The determination of these accruals requires the Company to make estimates of the frequency and extent of warranty activity and estimate future costs to replace the products under warranty. If the actual warranty activity and/or repair and replacement costs differ significantly from these estimates, adjustments to cost of revenue may be required in future periods.

The following table provides a summary of the activity related to the Company's warranty liability, included in other current liabilities, during the years ended December 31, 2019 and 2018 (in thousands):

	Twelve Months Ended December 31,	
	2019	2018
Beginning balance	\$ 423	\$ 468
Warranty accruals and adjustments	58	132
Warranty claims	(181)	(177)
Ending balance	\$ 300	\$ 423

Research and Development Expenses

Research and development costs are expensed as incurred.

Cash and Cash Equivalents

All highly liquid instruments with an original maturity of three months or less at the date of purchase are considered to be cash equivalents.

Accounts Receivable

The majority of the Company's commercial accounts receivable are due from Original Equipment Manufacturers ("OEM's"). Credit is extended based on an evaluation of a customer's financial condition and, generally, collateral is not required. Accounts receivable are payable in U.S. dollars, are due within 30-90 days and are stated at amounts due from customers net of an allowance for doubtful accounts. Any account outstanding longer than the contractual payment terms is considered past due.

Unbilled Accounts Receivable

Unbilled receivables principally represent revenues recorded under the over time method of accounting that have not been billed to customers in accordance with the contractual terms of the arrangement. We anticipate that the majority of the balance at December 31, 2019 will be collected during the 2020 fiscal year. As of December 31, 2019 and 2018, unbilled accounts receivable was \$0.2 million and \$0.2 million, respectively.

Allowance for Doubtful Accounts

The allowance for doubtful accounts reflects an estimate of probable losses inherent in the accounts receivable balance. The allowance is determined based on a variety of factors, including the length of time receivables are past due, historical experience, the customer's current ability to pay its obligation, and the condition of the general economy and the industry as a whole. The Company will record a specific reserve for individual accounts when the Company becomes aware of a customer's inability to meet its financial obligations, deterioration in the customer's operating results or financial position, or deterioration in the customer's credit history. If circumstances related to customers change, the Company would further adjust estimates of the recoverability of receivables. Account balances, when determined to be uncollectible, are charged against the allowance.

Inventories

Inventories are stated on a standard cost basis adjusted to approximate the lower of cost (as determined by the first-in, first-out method) or net realizable value. Cost includes materials, labor, and manufacturing overhead related to the purchase and production of inventories. The Company regularly reviews inventory quantities on hand, future purchase commitments with the Company's suppliers, and the estimated utility of the inventory. If the Company review indicates a reduction in utility below carrying value, the inventory is reduced to a new cost basis.

Equipment, Furniture and Leasehold Improvements

Equipment, furniture and leasehold improvements are stated at cost. Depreciation on equipment is calculated using the straight-line method of depreciation over the estimated useful life ranging from three to 10 years. Amortization of leasehold improvements is calculated by using the straight-line method over the shorter of their estimated useful lives or lease terms. Expenditures for maintenance and repairs are charged to expense as incurred.

The Company performs impairment tests on its long-lived assets when circumstances indicate that their carrying amounts may not be recoverable. If required, recoverability is tested by comparing the estimated future undiscounted cash flows of the asset or asset group to its carrying value. Impairment losses, if any, are recognized based on the excess of the assets' carrying amounts over their estimated fair values.

Intangible Assets - Patents

Acquired patents are recorded at purchase price as of the date acquired and amortized over the expected useful life which is generally the remaining life of the patent. Total intangible amortization expense was approximately \$32 and \$54 thousand for the years ended December 31, 2019 and 2018, respectively.

Advertising

Costs related to advertising and promotion of products are charged to sales and marketing expense as incurred. There was no advertising expense for the years ended December 31, 2019 and 2018.

Shipping and Handling Fees

The Company includes costs related to shipping and handling in cost of goods sold.

Income Taxes

The Company accounts for income taxes under an asset and liability approach that requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been recognized in the Company's financial statements or tax returns. The effect on deferred tax assets and liabilities of changes in tax rates will be recognized as income or expense in the period that the change occurs. The Company recognizes the effect of income tax positions which are more-likely-than-not of being sustained. A valuation allowance for deferred tax assets is recorded when it is more likely than not that some or all of the benefit from the deferred tax asset will not be realized. Changes in circumstances, assumptions and clarification of uncertain tax regimes may require changes to any valuation allowances associated with the Company's deferred tax assets.

Due to the Company's operating loss carryforwards, all tax years remain open to examination by the major taxing jurisdictions to which the Company is subject. In the event that the Company is assessed interest or penalties at some point in the future, it will be classified in the financial statements as tax expense.

For additional details regarding our accounting for income taxes, see Note 11 in the accompanying consolidated financial statements.

Net Loss per Common Share

Basic loss per share is computed using the weighted average number of common shares outstanding during the period, and excludes any dilutive effects of common stock equivalent shares such as stock options, warrants, and convertible preferred stock. Diluted loss per share is computed using the weighted average number of common shares outstanding and potentially dilutive common stock equivalent shares outstanding during the period. Common stock equivalent shares are excluded from the computation if their effect is anti-dilutive.

In accordance with Accounting Standards Codification ("ASC") 260, entities that have issued securities other than common stock that participate in dividends with the common stock ("participating securities") are required to apply the two-class method to compute basic EPS. The two-class method is an earnings allocation method under which EPS is calculated for each class of common stock and

participating security as if all such earnings had been distributed during the period.

The Company's Series B Convertible Preferred stock ("Preferred Stock – Series B") is considered a participating security as the preferred stock participates in dividends with the common stock, which requires the use of the two-class method when computing basic and diluted earnings per share. The Preferred Stock – Series B is not required to absorb any net loss. Although the Company paid a one-time special dividend in 2012, the Company does not expect to pay dividends on its common or preferred stock in the near future.

For the years ended December 31, 2019 and 2018, the Company reported a net loss and as a result, basic and diluted loss per common share are the same. Therefore, in calculating net loss per share amounts, shares underlying the potentially dilutive common stock equivalents were excluded from the calculation of diluted net income per common share because their effect was anti-dilutive.

The following is a table of the potentially dilutive common stock equivalents for the years ended December 31, 2019 and 2018 that were not included in diluted EPS as their effect would be anti-dilutive:

	Twelve Months Ended December 31,	
	2019	2018
Options	5,404,985	4,678,420
Warrants	19,295,773	9,055,773
Convertible preferred stock	7,545,333	7,545,333
Total potentially dilutive common stock equivalents	32,246,091	21,279,526

Comprehensive Income (loss)

Comprehensive income (loss) refers to net income (loss) and other revenue, expenses, gains and losses that, under generally accepted accounting principles, are recorded as an element of shareholders' equity but are excluded from the calculation of net income (loss).

The Company's operations did not give rise to any material items includable in comprehensive income (loss), which were not already in net income (loss) for the years ended December 31, 2019 and 2018. Accordingly, the Company's comprehensive income (loss) is the same as its net income (loss) for the periods presented.

Fair Value of Financial Instruments

Cash, cash equivalents, accounts receivable, short-term investments and accounts payable are stated at cost, which approximates fair value due to the short-term nature of these instruments. The Asset Based Lending Facility, ("ABL Facility") is also stated at cost, which approximates fair value because the interest rate is based on a market based rate plus a margin.

We have categorized our assets and liabilities that are valued at fair value on a recurring basis into three-level fair value hierarchy in accordance with GAAP. Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. The fair value hierarchy gives the highest priority to quoted prices in active markets for identical assets and liabilities (Level 1) and lowest priority to unobservable inputs (Level 3).

Assets and liabilities recorded in the balance sheets at fair value are categorized based on a hierarchy of inputs as follows:

Level 1 – Unadjusted quoted prices in active markets of identical assets or liabilities.

Level 2 – Quoted prices for similar assets or liabilities in active markets or inputs that are observable for the asset or liability, either directly or indirectly through market corroboration, for substantially the full term of the financial instrument.

Level 3 – Unobservable inputs for the asset or liability.

The common stock warrant liability discussed in Note 12 is currently the only financial assets or liability recorded at fair value on a recurring basis, and is considered a Level 3 liability. The fair value of the common stock warrant liability is included in current liabilities on the accompanying financial statements as of December 31, 2019, as the warrants are currently exercisable

The following table shows the reconciliation of the Level 3 warrant liability measured and recorded at fair value on a recurring basis, using significant unobservable inputs (in thousands):

	Estimated Fair Value
Balance as of January 1, 2019	\$ 1,497
Fair value of warrants issuance during period	-
Change in fair value of warrant liability, net	(1,474)
Balance as of December 31, 2019	\$ 23

The fair value of the liability for common stock purchase warrants at December 31, 2019 was estimated using the Black Scholes option pricing model based on the market value of the underlying common stock at the measurement date, the five year contractual term of the warrants, risk-free interest rates of 1.56%, no expected dividends and expected volatility of the price of the underlying common stock ranging from 40.3% to 46.4%.

Stock-based Compensation

The Company uses the fair value method of accounting for share-based compensation arrangements. The fair values of stock options are estimated at the date of grant using the Black-Scholes option valuation model. Stock-based compensation expense is reduced for estimated forfeitures and is amortized over the vesting period using the straight-line method.

Derivative Financial Instruments

The Company evaluates all financial instruments, including issued stock purchase warrants, to determine if such instruments are derivatives or contain features qualifying as embedded derivatives. For derivative financial instruments accounted for as liabilities, the derivative instrument is initially recorded at its fair value and is then re-valued at each reporting date, with changes in the fair value reported in the consolidated statement of operations. The Company uses the Black-Scholes option-pricing model to value the derivative instruments at inception and subsequent valuation dates. The classification of derivative instruments, including whether such instruments should be recorded as liabilities or as equity, is re-assessed at the end of each reporting period. The Company does not use derivative instruments to hedge exposures to cash flow, market, or foreign currency risks.

Concentration of Credit Risk

The majority of eMagin's products are sold throughout North America, Asia, and Europe. Sales to the Company's recurring customers are made generally on open account while sales to occasional customers are typically made on a prepaid basis. eMagin performs periodic credit evaluations on its recurring customers and generally does not require collateral. An allowance for doubtful accounts is maintained for credit losses.

Financial instruments which potentially subject the Company to concentrations of credit risk consist of cash and cash equivalents and short-term investments. The Company's cash and cash equivalents are deposited with financial institutions which, at times, may exceed federally insured limits. The Company invests surplus cash in a government money market fund that consists of U.S Government obligations and repurchase agreements collateralized by U.S. Government Obligations, which is not insured. To date, the Company has not experienced any loss associated with this risk.

Concentrations

The Company purchases principally all of its silicon wafers, which are a key ingredient in its OLED production process, from two suppliers located in Taiwan and Korea.

For the year ended December 31, 2019 and 2018, no single customer accounted for over 10% of net revenues.

Liquidity and Going Concern

The accompanying consolidated financial statements have been prepared on the going concern basis, which assumes that the Company will continue to operate as a going concern and which contemplates the realization of assets and the satisfaction of liabilities and commitments in the normal course of business. For the year ended December 31, 2019, the Company incurred a net loss of \$4.3 million and used cash in operating activities of \$5.1 million. At December 31, 2019, the Company had cash and cash equivalents of \$3.5 million, net working capital of \$8.8 million, outstanding debt of \$2.9 million, and outstanding borrowing availability under its ABL Facility of \$1.2 million.

Due to continuing losses, the Company's financial position, and uncertainty regarding the Company's ability to borrow under its ABL Facility, or continue to raise funds under its ATM facility, the Company may not be able to meet its financial obligations as they become

due without additional financing or sources of capital. Management is prepared to reduce expenses and raise additional capital, but there can be no assurance that the Company will be successful in sufficiently reducing expenses or raising capital to meet its operating needs.

The Company's ABL Facility expires on December 31, 2020 and renews automatically for another year unless terminated pursuant to its terms. Although our relationship with the lender is positive, there is no assurance the lender will renew or extend this facility, or continue to make funds available during 2020 and beyond at present availability levels, or at all. Therefore, in accordance with applicable accounting guidance, and based on the Company's current financial condition and availability of funds, there is substantial doubt about the Company's ability to continue as a going concern through twelve months from the date these financial statements were issued.

The Company has taken actions to increase revenues and to reduce expenses and is considering financing alternatives, but there can be no assurance that the Company will be successful in sufficiently increasing revenues, reducing expenses or securing additional financing to meet its operating needs. The Company's plans with regard to these matters include the following actions: 1) focus production and engineering resources on improving manufacturing yields and increasing production volumes, 2) a senior management Work Status Reduction, 3) reduce headcount and not replace departed employees, 4) reduce discretionary and other expenses, and 5) considering financing and/or strategic alternatives. In October 2019, senior management work status was reduced by approximately 20% under a work status reduction program.

Based on the Company's current projections, operational and yield improvements, and the anticipated availability of the ABL Facility, the Company estimates it will have sufficient liquidity to fund operations through the end of the fourth quarter of 2020. However, there can be no assurance the Company's plans will be achieved, or that the Company will be able to continue to borrow under its ABL Facility, continue to raise funds under its ATM facility, secure additional financing, and/or pursue strategic alternatives on terms acceptable to the Company, or at all.

Accounting Policy Updates

The Company adopted Accounting Standards Update ("ASU") 2016-02, Leases (Topic 842) on January 1, 2019. The Company evaluates whether leases are classified as operating or financing based on certain assumptions that require judgment, such as the asset's fair value, the asset's estimated residual value, the interest rate implicit in the lease, and the asset's economic useful life.

At the inception of a contractual arrangement, the Company determines whether the contract contains a lease by assessing whether there is an identified asset and whether the contract conveys the right to control the use of the identified asset in exchange for consideration over a period of time. If both criteria are met, the Company calculates the associated lease liability and corresponding right-of-use ("ROU") assets upon lease commencement using a discount rate based on a credit-adjusted secured borrowing rate commensurate with the term of the lease. The Company records lease liabilities within current or noncurrent liabilities based upon the length of time associated with the lease payments. The operating lease ROU assets includes any lease payments made and excludes lease incentives and initial direct costs incurred, if any, and are recorded as noncurrent assets. Lease terms may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option.

Leases with an initial term of 12 months or less are not recorded on the accompanying consolidated balance sheet. Lease expense for minimum lease payments is recognized on a straight-line basis over the lease term.

Equipment under capital lease obligations are classified as revenue earning assets and the related depreciation is recorded on the assets. Debt related to capital lease obligations is included in the Company's debt obligations.

Recently Adopted Accounting Standards

In August 2018, the SEC adopted the final rule under SEC Release No. 33-10532 - Disclosure Update and Simplification, amending certain disclosure requirements that were redundant, duplicative, overlapping, outdated or superseded. In addition, the amendments expanded the disclosure requirements on the analysis of stockholders' equity for interim financial statements. Under the amendments, an analysis of changes in each caption of stockholders' equity presented in the balance sheet must be provided in a note or separate statement. The analysis should present a reconciliation of the beginning balance to the ending balance of each period for which a statement of comprehensive income is required to be filed. This final rule was effective on November 5, 2018. The Company adopted the guidance on January 1, 2019, and such adoption did not have a material impact on its financial statements.

In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842) and subsequently issued amendments that replaced existing lease accounting guidance. The accounting standard requires lessees to recognize a lease liability and corresponding right-of-use asset on their balance sheets. The Company adopted the guidance effective January 1, 2019. The Company elected the transition package of three practical expedients permitted under the transition guidance and elected the optional transition method that allows for a cumulative-effect adjustment in the period of adoption, without a restatement of prior periods.

As a result of the adoption, the Company adjusted its beginning balance at January 1, 2019 by recording operating lease ROU assets and liabilities through a cumulative-effect adjustment. The adoption impacted the accompanying consolidated balance sheet, but did not

have an impact on the consolidated statements of operations and comprehensive loss.

The impact of the adoption of ASC 842 on the accompanying consolidated balance sheet as of January 1, 2019 was as follows (in thousands).

	December 31, 2018	Adjustments Due to the Adoption of ASC 842	January 1, 2019
<i>Right of Use Assets (1)</i>			
Operating lease - right of use asset	\$ —	\$ 4,267	\$ 4,267
<i>Operating lease liabilities</i>			
Current	\$ —	\$ 964	\$ 964
Noncurrent	\$ —	\$ 3,432	\$ 3,432

(1) Operating lease right-of-use assets includes deferred rent of \$129 thousand

Recently Issued Accounting Standards

In June 2016, the FASB issued ASU No. 2016-13, Financial Instruments - Credit Losses (Topic 326) and subsequently issued amendments. The guidance affects the Company's accounts receivable, and it requires the measurement of expected credit losses to be based on relevant information from past events, including historical experiences, current conditions and reasonable and supportable forecasts that affect collectability. This new guidance is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2022. Based on the composition of the Company's receivables, current market conditions and historical credit loss activity, the Company does not expect the adoption of this ASU to have a significant impact on the consolidated financial statements.

In August 2018, the FASB issued ASU No. 2018-13, Fair Value Measurement (Topic 820) a guidance that adds, amends, and removes certain disclosure requirements related to fair value measurements. Among other changes, this standard requires certain additional disclosure surrounding Level 3 assets, including changes in unrealized gains or losses in other comprehensive income and certain inputs in those measurements. This new guidance is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019. Certain amended or eliminated disclosures in this standard may be adopted early, while certain additional disclosure requirements in this standard can be adopted on its effective date. In addition, certain changes in the standard require retrospective adoption, while other changes must be adopted prospectively. The Company is currently evaluating the impact of this guidance on the Company's disclosures; however, the Company does not expect the adoption of this ASU to have a significant impact on the consolidated financial statements.

In December 2019, the FASB issued ASU 2019-12, Income Taxes (Topic 740) as part of its initiative to reduce complexity in accounting standards. This standard simplify the accounting for income taxes. This new guidance is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2020. This standard may be adopted early, while certain additional disclosure requirements in this standard can be adopted on its effective date. In addition, certain changes in the standard require retrospective adoption, while other changes must be adopted prospectively. The Company is currently evaluating the impact of this guidance on the Company's disclosures; however, the Company does not expect the adoption of this ASU to have a significant impact on the consolidated financial statements.

Note 3 - Impairment of Consumer Night Vision Business Assets

During the quarter ended June 30, 2018 the Company made a decision to exit the business associated with its two consumer night vision products, BlazeSpark and BlazeTorch (the "Consumer Night Vision Business"). The Company's decision was based on lower than anticipated sales and an assessment performed during the quarter of the anticipated level of additional engineering, marketing and financial resources necessary to modify the products for an expanded market. As a result, the Company concluded an impairment had occurred and wrote-down \$2.7 million of related Consumer Night Vision Business inventory, which includes an accrual of \$1.4 million of inventory purchased by a contract manufacturer in anticipation of future production, and \$0.1 million of production tooling, which are reflected in cost of revenues in the accompanying Consolidated Statements of Operations.

Note 4 – Revenue Recognition

All of the Company's revenues are earned from contracts with customers and are classified as either Product or Contract revenues. Contracts include written agreements and purchase orders, as well as arrangements that are implied by customary practices or law.

Disaggregation of Revenue

The Company sells products directly to military contractors and OEM's and they use our displays in a diverse range of applications encompassing the military, and commercial, including medical and industrial, market sectors. Revenues are classified as either military, commercial, consumer or multiple based on management's knowledge of the customer's products and markets served by displays or the R&D contract work. Revenues classified as Multiple are for sales to customers that incorporate the Company's displays in products that could be used for either Military or Commercial applications. R&D activities are performed for both military customers and U.S. Government defense related agencies and consumer companies. Product and Contract revenues are disclosed on the Consolidated Statements of Operations.

Additional disaggregated revenue information for the years ended December 31, 2019 and 2018 were as follows (in thousands):

	Twelve Months Ended December 31,	
	2019	2018
North and South America	\$ 14,566	\$ 13,969
Europe, Middle East, and Africa	11,112	9,157
Asia Pacific	1,048	3,109
Total	\$ 26,726	\$ 26,235

	Twelve Months Ended December 31,	
	2019	2018
Military	65 %	75 %
Commercial, including industrial and medical	12 %	10 %
Consumer	4 %	6 %
Multiple	19 %	9 %
	100 %	100 %

Accounts Receivable from Customers

Accounts receivable, net of allowances, associated with revenue from customers were approximately \$4.0 million and \$3.2 million as of December 31, 2019 and 2018, respectively.

Contract Assets and Liabilities

Unbilled Accounts Receivables (Contract Assets) - Pursuant to the over time revenue recognition model, revenue may be recognized prior to the customer being invoiced. An unbilled accounts receivable is recorded to reflect revenue that is recognized when the proportional performance method is applied and such revenue exceeds the amount invoiced to the customer. Unbilled receivables are disclosed on the Consolidated Balance Sheet as of December 31, 2019 and 2018.

Customer Advances and Deposits (Contract Liabilities)

The Company recognizes a contract liability when it has billed and received consideration from the customer pursuant to the terms of a contract but has not yet recognized the related revenue. These billings in excess of revenue are classified as deferred revenue on the Consolidated Statements of Operations.

Total contract assets and liabilities consisted of the following amounts (in thousands):

	December 31, 2019	December 31, 2018
Unbilled Receivables (contract assets)	\$ 155	\$ 224
Deferred Revenue (contract liabilities)	\$ (277)	\$ (38)

During the years ended December 31, 2019 and 2018, the Company recognized \$0.2 million and \$0.7 million of revenue related to its contract liabilities that existed at December 31, 2018 and 2017, respectively.

Remaining Performance Obligations.

The Company has elected the practical expedient, which allows disclosure of remaining performance obligations only for contracts with an original duration of greater than one year. Such remaining performance obligations primarily relate to engineering and design services. As of December 31, 2019 and 2018, the aggregate amount of the transaction price allocated to remaining performance obligations was \$1.4 million and \$1.1 million. The Company expects to recognize revenue on all of its remaining performance obligations over the next 12 months.

Note 5 – Accounts Receivable, net

Accounts receivable consisted of the following (in thousands):

	December 31, 2019	December 31, 2018
Accounts receivable	\$ 4,105	\$ 3,325
Less allowance for doubtful accounts	(139)	(139)
Accounts receivable, net	\$ 3,966	\$ 3,186

Note 6 – Inventories, net

The components of inventories were as follows (in thousands):

	December 31, 2019	December 31, 2018
Raw materials	\$ 2,788	\$ 3,701
Work in process	1,561	1,033
Finished goods	5,248	4,888
Total inventories	9,597	9,622
Less inventory reserve	(765)	(1,040)
Total inventories, net	\$ 8,832	\$ 8,582

Note 7 – Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets consist of the following (in thousands):

	December 31, 2019	2018
Vendor prepayments	\$ 657	\$ 702
Other prepaid expenses	473	173
Total prepaid expenses and other current assets	\$ 1,130	\$ 875

Note 8 – Equipment, Furniture and Leasehold Improvements

Equipment, furniture and leasehold improvements consist of the following (in thousands):

	December 31, 2019	2018
Computer hardware and software	\$ 893	\$ 800
Lab and factory equipment	17,482	17,107
Furniture, fixtures and office equipment	59	48
Assets under capital leases	116	66
Construction in progress	2,668	2,114
Leasehold improvements	60	22
Total equipment, furniture and leasehold improvements	21,278	20,157
Less: accumulated depreciation	(13,178)	(11,236)
Equipment, furniture and leasehold improvements, net	\$ 8,100	\$ 8,921

Depreciation expense was \$1.9 million for the years ended December 31, 2019 and 2018, respectively. Depreciation expense was \$11 thousand for assets under capital leases for the year ended December 31, 2019.

Note 9 – Debt / Line of Credit

(in thousands)

	2019	2018
Revolving credit facility	\$ 2,891	\$ —
Less: unamortized debt issuance costs	—	—
Revolving credit facility, net	\$ 2,891	\$ —

On December 21, 2016, the Company entered into a new ABL Facility with a lender that provides for up to a maximum amount of \$5 million based on a borrowing base equivalent of 85% of eligible accounts receivable plus the lesser of \$2 million or 50% of eligible inventory. The interest on the ABL Facility is equal to the Prime Rate plus 3% but may not be less than 6.5% with a minimum monthly interest payment of \$2 thousand. The Company is also obligated to pay the lender a monthly administrative fee of \$1 thousand and an annual facility fee equal to 1% of the maximum amount borrowable under the facility. As of December 31, 2019, the interest rate on outstanding borrowings was 7.75%. The ABL Facility renewed on December 31, 2019 and will automatically renew on December 31, 2020 for a one-year term unless written notice to terminate the agreement is provided by either party. In conjunction with entering into the financing, the Company incurred \$0.2 million of debt issuance costs including lender and legal costs that were amortized over the original three-year term of the ABL Facility. The ABL Facility agreement contains certain lenders remedies that upon events of default, give the bank the ability to terminate the facility before the scheduled maturity date. Accordingly, the Company classifies borrowing under the ABL Facility as current liabilities on the accompanying balance sheets.

The ABL Facility is secured by a lien on all receivables, property and the proceeds thereof, credit insurance policies and other insurance relating to the collateral, books, records and other general intangibles, inventory and equipment, proceeds of the collateral and accounts, instruments, chattel paper, and documents. Collections received on accounts receivable are directly used to pay down the outstanding borrowings on the credit facility.

The ABL Facility contains customary representations and warranties, affirmative and negative covenants and events of default. The Company is required to maintain a minimum tangible net worth of \$13 million and a minimum working capital balance of \$4 million at all times. As of December 31, 2019, the Company had unused borrowing availability of \$1.2 million and were in compliance with all financial debt covenants.

For the years ended December 31, 2019 and 2018, interest expense includes interest paid, or accrued, and amortization or write-off of debt issuance costs of approximately \$82 thousand on outstanding debt.

Note 10 – Leases

The Company leases office and manufacturing facilities in Hopewell Junction, NY under a non-cancelable operating lease agreement. The lease for these facilities, as amended, expires in May 2024 and does not contain a renewal option. The lease agreement does not contain any residual value guarantees, or material restrictive covenants.

The Company also leases an office facility for its design group in Santa Clara, California. During the fourth quarter of 2019, the Company signed a two-year extension of this lease that expires in October 2021. The lease agreement does not contain any residual value guarantees, material restrictive covenants or a renewal option.

The Company's operating leases generally do not provide an implicit rate, and therefore the Company uses its incremental borrowing rate as the discount rate when measuring operating lease liabilities. The incremental borrowing rate represents an estimate of the interest rate the Company would incur at lease commencement to borrow an amount equal to the lease payments on a collateralized basis over the term of a lease within a particular currency environment. The Company used incremental borrowing rates as of January 1, 2019 for operating leases that commenced prior to that date.

On May 2, 2019, the Company entered into a three-year finance lease commitment for phone equipment. Finance leases are included in equipment, furniture and leasehold improvements, net, Other current liabilities, and Finance lease liability – long term in our consolidated Balance Sheet.

Rent expense was approximately \$1.0 million for each of the years ended December 31, 2019 and 2018.

The components of lease expense were as follows (in thousands):

	Twelve Months Ended December 31, 2019
Finance Lease Cost:	
Amortization of right-of-use assets	\$ 11
Interest on lease liabilities	3
Operating lease cost	986
Short-term lease cost	58
Total Lease Cost	\$ 1,058

Other Information

Cash paid for amounts included in the measurement lease liabilities:

Operating cash flows from operating leases	\$ 1,012
Financing cash flows from finance leases	\$ 13
Right-of-use assets obtained in exchange for new finance lease liabilities	\$ 50
Right-of-use assets obtained in exchange for new operating lease liabilities	\$ 110

	December 31, 2019
Finance lease right-of-use assets	\$ 40
Operating lease right-of-use assets	\$ 3,729
Finance lease liability, current	\$ 16
Finance lease liability, non-current	\$ 24
Operating lease liabilities, current	\$ 775
Operating lease liabilities, non-current	\$ 3,067
Weighted average remaining lease terms - finance leases	2.33 years
Weighted average remaining lease terms - operating leases	4.42 years
Weighted average discount rate - finance leases	10.91%
Weighted average discount rate - operating leases	8.48%

Future annual minimum lease payments and finance lease commitments as of December 31, 2019 were as follows (in thousands):

	Operating Leases	Finance Leases
2020	\$ 1,063	\$ 20
2021	1,054	20
2022	1,014	6
2023	1,022	-
2024	426	-
Thereafter	-	-
Total undiscounted future minimum lease payments	4,579	46
Less imputed interest	737	6
Lease liability	\$ 3,842	\$ 40

Note 11 – Income Taxes

New Tax Legislation

On December 22, 2017, the President of the United States signed into law the Tax Cuts and Jobs Act (“TCJA”). The legislation significantly changed U.S. tax law by, among other things, lowering the corporate income tax rate from 35% to 21% and changing the carryforward and utilization of net operating losses. We will monitor future interpretations of the TCJA as they develop, and accordingly our estimates may change.

As a result of the reduction in federal corporate income tax rates provisioned by the TCJA the Company recorded a reduction to its deferred tax assets of \$19.0 million at December 31, 2017 and a corresponding reduction to its valuation allowance. The Company’s net deferred tax asset at December 31, 2019 and 2018 reflect the current reduced federal income tax rates. In addition, the Company will file a claim for a federal tax refund of approximately \$0.2 million for its AMT credit carryforward in tax years 2018 to 2021 pursuant

to the applicable provisions of the TCJA.

Net loss before income taxes consists of the following (in thousands):

	For the Years Ended December 31,	
	2019	2018
Domestic, current	\$ (4,298)	\$ (9,542)
Total	\$ (4,298)	\$ (9,542)

The tax effects of significant items comprising the Company's deferred taxes are as follows (numbers are in thousands):

	For the Years Ended December 31,	
	2019	2018
Deferred tax assets:		
Federal and state net operating loss carryforwards	\$ 30,428	\$ 30,350
Research and development tax credit carryforwards	2,479	2,438
Stock based compensation	1,632	1,470
Other provision and expenses not currently deductible	1,327	1,345
Total deferred tax assets	35,866	35,603
Deferred tax liabilities:		
Depreciation and amortization	(693)	(726)
Prepaid expenses	(195)	(151)
Total deferred liabilities	(888)	(877)
Less: valuation allowance	(34,978)	(34,726)
Net deferred tax asset	\$ —	\$ —

The Company accounts for income taxes under an asset and liability approach that requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been recognized in the Company's financial statements or tax returns. The effect on deferred tax assets and liabilities of changes in tax rates will be recognized as income or expense in the period that the change occurs. A valuation allowance for deferred tax assets is recorded when it is more likely than not that some or all of the benefit from the deferred tax asset will not be realized. Changes in circumstances, assumptions and clarification of uncertain tax regimes may require changes to any valuation allowances associated with the Company's deferred tax assets.

As of December 31, 2019, the Company's deferred tax assets were generated primarily from the federal and state net operating loss, stock based compensation and research and development tax credits. In assessing the realizability of deferred tax assets, management determined that it is more likely than not that none of the deferred tax assets will be realized. Therefore, the Company has provided a full valuation allowance against the deferred tax assets at December 31, 2019 and 2018.

As of December 31, 2019 and 2018, the Company had net deferred tax assets before its valuation allowance of \$35.0 million and \$34.7 million, respectively.

During the year ended December 31, 2019, the Company did not utilize its prior years' net operating loss carryforwards and the net operating loss of \$5.3 million that originated in 1998 expired. As of December 31, 2019, eMagin has federal and state net operating loss carryforwards of \$142.7 million and federal research and development tax credit carryforwards of \$2.5 million. Pursuant to provisions of the TCJA, the net operating losses originating in years subsequent to 2017 totaling \$14.7 million can be carried forward indefinitely.

The federal net operating losses and tax credit carryforwards will expire as follows (in thousands):

	Net Operating Losses	Research and Development Tax Credits
2019-2020	\$ 24,931	\$ 653
2021-2024	41,283	-
2025-2037	61,755	1,826
No Expiration	14,705	-
	\$ 142,674	\$ 2,479

The utilization of net operating losses can be subject to a limitation due to the change of ownership provisions under Section 382 of the Internal Revenue Code and similar state provisions. Such limitation may result in the expiration of the net operating losses before their utilization. The Company has done an analysis regarding prior year ownership changes, and it has been determined that the Section 382 limitation on the utilization of net operating losses will currently not materially affect the Company's ability to utilize its net operating losses.

The difference between the statutory federal income tax rate on the Company's pre-tax loss and the Company's effective income tax rate is summarized as follows:

	For the Years Ended December 31,	
	2019	2018
U.S. Federal income tax benefit at federal statutory rate	21 %	21 %
Change in valuation allowance	(6)	(21)
Permanent differences	7	(3)
NOL Expiration - 1998	(26)	-
Other, net	4	3
Effective tax rate	- %	- %

The Company did not have unrecognized tax benefits at December 31, 2019 and 2018. The Company recognizes interest accrued and penalties related to unrecognized tax benefits in tax expense. During the years ended December 31, 2019 and 2018, the Company recognized no interest and penalties.

The Company files income tax returns in the U.S. federal jurisdiction and in certain U.S. states. Generally, the Company's tax filings are subject to tax examinations by major taxing jurisdictions during the three years period subsequent to the due date of such returns, or if later, when the return is filed. However, due to the Company's operating losses, the utilization of a net operating loss subjects the year that such loss originated to being open for examination by major taxing jurisdictions to which the Company is subject.

Note 12 – Warrants

The Company accounts for common stock warrants pursuant to applicable accounting guidance contained in ASC 815, "Derivatives and Hedging - Contracts in Entity's Own Equity" and makes a determination as to their treatment as either equity instruments or a warrant liability based on an analysis of the underlying warrant agreements.

	Issued	Outstanding	Exercise Price	Expire
2015 Warrant Issuance	383,500	383,500	2.05	Jun 2021
2016 Warrant Issuance	2,947,949	2,947,949	2.60	Feb 2023
2017 Warrant Issuance ⁽¹⁾⁽²⁾	100,000	100,000	2.25	Mar 2022
2017 Warrant Issuance ⁽¹⁾	1,650,000	1,650,000	2.45	Nov 2022
2018 Warrant Issuance ⁽¹⁾	4,004,324	3,974,324	1.55	Jul 2023
2019 Warrant Issuance	240,000	240,000	0.55	Apr 2024
2019 Warrant Issuance ⁽³⁾	4,000,000	4,000,000	0.49	Oct 2024
2019 Warrant Issuance ⁽⁴⁾	6,000,000	6,000,000	0.78	Oct 2024

- (1) Warrants are subject to liability accounting.
- (2) Issued in conjunction with an unsecured line of credit as described in Note 9: Debt / Line of Credit .
- (3) Immediately exercisable pre-funded warrants at an exercise price of \$0.01 per share.
- (4) Private Placement unregistered warrants exercisable six months following issuance .

Equity classified warrants

The 2015, 2016, and 2019 warrants share similar terms, and the exercise price of the Warrant Shares are subject to adjustment in the event of any stock dividends and splits, reverse stock splits, stock dividends, recapitalizations, reorganizations or similar transactions. The Warrants will be exercisable on a "cashless" basis in certain circumstances, including in the event a registration statement is not in effect at time of exercise. The warrant agreements contain a clause specifying that in the event there is no effective registration in effect for the underlying warrant shares to be issued at time of exercise, in no circumstance will the Company be required to net cash settle the warrants.

Based on the Company's analysis of the terms and conditions of the warrants, the Company has concluded that they meet the conditions outlined in applicable accounting guidance to be classified as equity instruments. As a result, the Company has accounted for the exercise price paid by investors for purchase of the pre-funded warrants as additional paid in capital on the accompanying Balance Sheets as of December 31, 2019.

Liability classified warrants

The 2017 and 2018 warrants have alternative settlement provisions that, at the option of the holder, provide for physical settlement or if, at the time of settlement there is no effective registration statement, a cashless exercise as defined in the warrant agreement.

Based on analysis of the underlying warrant agreement and applicable accounting guidance, the Company concluded that these registered warrants require the issuance of registered securities upon exercise and do not sufficiently preclude an implied right to net cash settlement. Accordingly, these warrants were classified in the accompanying Consolidated Balance Sheet as a current liability upon issuance and will be revalued at each subsequent balance sheet date.

The fair value of the liability for common stock purchase warrants is estimated using the Black Scholes option pricing model based on the market value of the underlying common stock at the measurement date, the contractual term of the warrant, risk-free interest rates, expected dividends and expected volatility of the price of the underlying common stock.

Based on the Black Scholes method the fair value of the Company's warrants are as follows (in thousands):

	2019	2018
2018 January and February Issuance		
Fair Value at December 31,	\$ 22	\$ 1,342
2017 May issuance		
Fair Value at December 31,	1	155
	\$ 23	\$ 1,497
Twelve Months Ended December 31,		
Change in Fair Value of common stock warrant liability ⁽¹⁾	\$ 1,474	\$ 2,194

(1) The combined changes in fair value is reflected as income from change in the fair market value of common stock warrant liability.

Note 13 – Shareholders' Equity

Preferred Stock - Series B Convertible Preferred Stock ("the Preferred Stock – Series B")

The Company has designated 10,000 shares of the Company's preferred stock as Preferred Stock – Series B at a stated value of \$1,000 per share. The Preferred Stock – Series B is convertible into common stock at a conversion price of \$0.75 per share. The holders of the Preferred Stock – Series B are not entitled to receive dividends unless the Company's Board of Directors declare a dividend for holders of the Company's common stock and then the dividend shall be equal to the amount that such holder would have been entitled to receive if the holder converted its Preferred Stock – Series B into shares of the Company's common stock. In the event of a liquidation, dissolution, or winding up of the Company, the Preferred Stock – Series B is entitled to receive liquidation preference before the Common Stock. The Company may at its option redeem the Preferred Stock – Series B by providing the required notice to the holders of the Preferred Stock – Series B and paying an amount equal to \$1,000 multiplied by the number of shares for all of such holder's shares of outstanding Preferred Stock – Series B to be redeemed.

As of December 31, 2019 and 2018, there were 5,659 shares of Preferred Stock – Series B issued and outstanding.

Common Stock

Common share activity due to options and warrants (dollar amounts in thousands):

	Twelve Months Ended December 31,	
	2019	2018
Options exercised	12,500	99,937
Proceeds	\$ 9	\$ 98
Warrants exercised	-	30,000
Proceeds	\$ -	\$ 46

Equity Issuances

On January 25, 2018 the Company entered into an underwriting agreement to issue and sell 9,807,105 shares of Company Common Stock, together with warrants to purchase 3,922,842 shares of Common Stock with an initial exercise price of \$1.55 per share (at a public offering price of \$1.35 per fixed combination consisting of one share of Common Stock and associated warrant to purchase four tenths of one share of Common Stock). The offering closed on January 29, 2018 and the Company received net proceeds after underwriting discounts and expenses of \$11.9 million.

In a concurrent private placement, certain of our directors and officers purchased an aggregate of 203,708 shares of Common Stock, together with warrants to purchase up to 81,487 shares of Common Stock at the public offering price of \$1.35 per fixed combination. The private placement closed on February 15, 2018, and the Company received net proceeds of \$0.3 million.

On April 9, 2019, the Company closed a registered direct offering of 4.0 million shares of common stock at a purchase price per share of \$0.50, for gross proceeds of approximately \$2.0 million before deducting placement agent fees and other offering expenses. The Company also issued unregistered warrants to the investor to purchase up to 3.0 million shares of common stock at an exercise price of \$0.78 per share. The warrants are exercisable nine months following issuance and will expire five and one-half years from the issuance date.

On April 11, 2019, the Company closed an additional \$2.0 million registered direct offering consisting of immediately exercisable pre-funded warrants to purchase up to 4.0 million shares of our common stock at a purchase price of \$0.49 per warrant and an exercise price of \$0.01 per share. In a concurrent private placement, the Company also issued to the investor in the registered direct offering unregistered warrants to purchase up to 3.0 million shares of the Company's common stock at an exercise price of \$0.78 per share. The unregistered warrants are exercisable six months following issuance and will expire five and one-half years from the issuance date.

On November 22, 2019, the Company entered into an ATM offering agreement with H.C. Wainwright & Co., LLC, ("Wainwright") relating to shares of our common stock. In accordance with the terms of the sales agreement, we may offer and sell up to 5.0 million shares of our common stock having an aggregate offering price of up to \$1.7 million from time to time through Wainwright acting as our sales agent. Wainwright will be entitled to compensation at a fixed commission rate equal to 3.0% of the gross proceeds per share sold under the sales agreement. We intend to use any net proceeds from this offering to fund working capital requirements and for other general corporate purposes.

Note 14 – Stock Compensation

Employee stock purchase plan

In 2005, the shareholders approved the 2005 Employee Stock Purchase Plan ("ESPP"). The ESPP provides the Company's employees with the opportunity to purchase common stock through payroll deductions. Employees may purchase stock semi-annually at a price that is 85% of the fair market value at certain plan-defined dates. At December 31, 2016, the number of shares of common stock available for issuance was 300,000. As of December 31, 2019, the plan had not been implemented.

Incentive compensation plans

The 2017 Incentive Stock Plan (the "2017 Plan") adopted and approved by the shareholders on May 25, 2017 provides for grants of common stock and options to purchase shares of common stock to employees, officers, directors and consultants. The 2017 Plan has an aggregate of 2.0 million shares. Vesting terms of the options range from immediate vesting to a ratable vesting period of 5 years.

The 2019 Employee and Consultant Stock Option and Incentive Plan (the "2019 Employee and Consultant Plan") was adopted and approved by the shareholders on December 5, 2019 was designed to enhance the flexibility to grant equity awards to officers, employees and consultants and to ensure grant of equity awards to eligible recipients. The 2019 Plan has an aggregate of 5.0 million shares and permits an award of stock options (both incentive and non-qualified options), stock appreciation rights, restricted stock, restricted stock units, unrestricted stock, dividend equivalent rights and cash-based awards. A minimum vesting period of one year is required for all equity awards.

Option activity for the year ended December 31, 2019 is summarized as follows:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (In Years)	Aggregate Intrinsic Value
Outstanding at December 31, 2018	4,678,420	\$ 2.81		
Options granted	1,438,695	0.65		
Options exercised	(12,500)	0.70		
Options forfeited	(9,200)	2.66		
Options cancelled or expired	(690,430)	1.54		
Outstanding at December 31, 2019	5,404,985	\$ 2.40	3.52	\$ —
Vested or expected to vest at December 31, 2019 (1)	5,401,528	\$ 2.40	3.52	\$ —
Exercisable at December 31, 2019	5,232,179	\$ 2.40	3.52	\$ —

(1) The expected to vest options are the result of applying the pre-vesting forfeiture rate assumptions to total unvested options.

At December 31, 2019, there were 5.0 and 2.0 million shares available for grant under the 2019 Employee and Consultant and Non - Employee Director Incentive Plans and 49,834 shares available for grant under the 2017 Plan. There are no shares available for grant under older plans.

The aggregate intrinsic value in the table above represents the difference between the exercise price of the underlying options and the quoted price of the Company's common stock on December 31, 2019 for the options that were in-the-money. As of December 31, 2019 there were no options that were in-the-money. The Company's closing stock price was \$0.34 as of December 31, 2019. The Company issues new shares of common stock upon exercise of stock options. The intrinsic value of options exercised was \$2.0 thousand for the year ended December 31, 2019.

Stock-based compensation

The Company uses the fair value method of accounting for share-based compensation arrangements. The fair value of stock options is estimated at the date of grant using the Black-Scholes option valuation model. Stock-based compensation expense is reduced for estimated forfeitures and is amortized over the vesting period using the straight-line method.

The following table summarizes the allocation of non-cash stock-based compensation to the Company's expense categories for the years ended December 31, 2019 and 2018 (in thousands):

	Twelve Months Ended December 31,	
	2019	2018
Cost of revenues	\$ 25	\$ 36
Research and development	85	95
Selling, general and administrative	441	479
Total stock compensation expense	\$ 551	\$ 610

At December 31, 2019, total unrecognized compensation costs related to stock options was approximately \$0.4 million, net of estimated forfeitures. Total unrecognized compensation cost will be adjusted for future changes in estimated forfeitures and is expected to be recognized over a weighted average period of approximately 0.7 years.

The following key assumptions were used in the Black-Scholes option pricing model to determine the fair value of stock options granted:

	Twelve Months Ended December 31,	
	2019	2018
Dividend yield	0 %	0 %
Risk free interest rates	1.77-2.48 %	2.16-2.75 %
Expected volatility	41.7 to 49.2 %	46.4 to 50.0 %
Expected term (in years)	3.5 to 4.0	3.5 to 4.8

The weighted average fair value per share for options granted in 2019 and 2018 was \$0.65 and \$1.70, respectively.

There were no dividends declared or paid in 2019 or 2018. The Company does not expect to pay dividends in the near future; therefore, it used an expected dividend yield of 0%. The risk-free interest rate used in the Black-Scholes option pricing model is based on the implied yield at the time of grant available on U.S. Treasury securities with an equivalent term. Expected volatility is based on the weighted average historical volatility of the Company's common stock for the equivalent term. The expected term of options represents the period that the Company's stock-based awards are expected to be outstanding and was determined based on historical experience and vesting schedules of similar awards.

Note 15 – Commitments and Contingencies

Equipment Purchase Commitments

The Company has committed to equipment purchases of approximately \$0.3 million at December 31, 2019.

Employee benefit plans

The Company's U.S. employees participate in a defined contribution plan. Under the provisions of the plan, an employee is fully vested with respect to Company contributions after five years of service. The Company matches employee contributions of 50% up to a

maximum of 3% of qualified compensation. The Company's contributions were \$0.1 million for the year ended December 31, 2019 and there were no Company contributions for the years ended December 31, 2018.

Change in Control agreements

The Company entered into change in control agreements with certain of its executive officers, non-executive officers and managers. The agreements specify various employment-related matters, including annual compensation, performance incentive bonuses, and severance benefits in the event of termination with or without cause.

Litigation

From time to time, the Company is subject to various legal proceedings and claims that arise in the ordinary course of business. In March 2019, we received a demand letter seeking payment of \$0.9 million of outstanding invoices relating to purchased inventory from Suga Electronics Limited, or Suga, a contract manufacturer located in China, which manufactured product sold by their consumer night vision business. We responded to the demand letter, and requested that Suga provide substantiation of purchased inventory.

During September and October 2019, the Company held discussions with Suga to attempt to reach a settlement; however, in November 2019 the Company received a formal request for arbitration which Suga filed with the International Chamber of Commerce or ICC. The Company retained local counsel in Hong Kong to represent it before the ICC and in December 2019 filed an answer to Suga's request for arbitration including a counterclaim seeking repayment of amounts previously paid to Suga. The parties are currently awaiting the appointment of an arbitrator by the ICC.

As disclosed, during the quarter ended June 30, 2018, we made a decision to exit the consumer night vision business and accrued approximately \$1.0 million related to invoices received for inventory purchased by Suga in anticipation of future production. While we believe that we have adequately accrued for the losses and are in discussions to resolve related claims by the contract manufacturers, there is the risk that additional losses or litigation related expenses may be incurred above the amounts accrued for as of December 31, 2019, if we fail to resolve these claims in a timely and/or favorable manner.

Note 16 – Quarterly Financial Information (Unaudited)

Summarized quarterly financial information for 2019 and 2018 are as follows (in thousands except share data):

	Quarters Ended			
	March 31, 2019	June 30, 2019	September 30, 2019	December 31, 2019
Revenues	\$ 6,112	\$ 5,361	\$ 7,919	\$ 7,334
Gross profit	\$ 1,336	\$ 225	\$ 2,491	\$ 2,676
Net income (loss) before income tax	\$ (1,439)	\$ (2,337)	\$ (315)	\$ (207)
Net loss	\$ (1,439)	\$ (2,337)	\$ (315)	\$ (207)
Net loss per share - basic	\$ (0.03)	\$ (0.05)	\$ (0.01)	\$ (0.00)
Net loss per share - diluted	\$ (0.03)	\$ (0.05)	\$ (0.01)	\$ (0.00)
Weighted average number of shares outstanding - basic	45,161,273	48,817,940	49,173,773	49,316,852
Weighted average number of shares outstanding - diluted	45,161,273	48,817,940	49,173,773	49,316,852

	Quarters Ended			
	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018
Revenues	\$ 6,867	\$ 7,066	\$ 6,867	\$ 5,435
Gross profit	\$ 1,980	\$ 106	\$ 2,379	\$ (471)
Net loss before income tax	\$ (2,081)	\$ (5,065)	\$ 63	\$ (2,459)
Net loss	\$ (2,081)	\$ (5,065)	\$ 63	\$ (2,459)
Net loss per share - basic	\$ (0.05)	\$ (0.11)	\$ 0.00	\$ (0.05)
Net loss per share - diluted	\$ (0.05)	\$ (0.11)	\$ 0.00	\$ (0.05)
Weighted average number of shares outstanding - basic	42,255,189	45,111,273	45,149,717	45,161,273
Weighted average number of shares outstanding - diluted	42,255,189	45,111,273	45,265,370	45,161,273

Note 17 – Subsequent Events

On February 13, 2020, we have entered into a n amendment to the ATM offering agreement, dated November 22, 2019, with Wainwright. The Amendment modifies the Agreement to amend the aggregate offering price up to \$2.5 million of the shares that the Company may offer and sell through Wainwright from time to time. Wainwright will be entitled to reimbursement up to \$15 thousand under the sales agreement. We intend to use the net proceeds from this offering to fund working capital requirements and for other general corporate purposes.

eMagin Corporation

Description of the Registrant's Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934

The following is a summary of the rights and preferences of the common stock and preferred stock of eMagin Corporation, a Delaware corporation (the "Company"), and certain provisions of the Company's amended and restated certificate of incorporation (the "certificate of incorporation"), amended and restated bylaws (the "bylaws") and certificate of designations (the "certificate of designations") of the Company's Series B Convertible Preferred Stock (the "Series B Preferred Stock"), and applicable provisions of the Delaware General Corporation Law (the "DGCL"). This summary does not purport to be complete and is qualified in its entirety by the provisions of our certificate of incorporation, bylaws and the certificate of designations, each of which is included as an exhibit to the Annual Report on Form 10-K of which this exhibit forms a part, and the DGCL.

In this description, the terms "the Company," "we," "our" and "us" means eMagin Corporation.

General

We are authorized to issue 200,000,000 shares of common stock, \$0.001 par value per share, and 10,000,000 shares of preferred stock, \$0.001 par value per share, of which 10,000 shares have been designated as Series B Preferred Stock. Our Series B Preferred Stock is not registered pursuant to Section 12 of the Exchange Act of 1934, as amended (the "Exchange Act") nor listed on any securities exchange, however we include a summary of certain terms of the Series B Preferred Stock as relevant to holders of our common stock.

Common Stock

Dividend Rights

Subject to the preferences applicable to holders of shares of our preferred stock, holders of common stock are entitled to receive ratably dividends, if any, when and as declared by our board of directors out of any funds of the Company of the legally available therefor.

Under the bylaws, our board of directors has the power to declare dividends or distributions out of contributed surplus, and to determine that any dividend shall be paid in cash or shall be satisfied in paying up in full shares to be issued to the shareholders credited as fully paid or partly paid or partly in one way or partly in the other. Our board of directors may also pay any fixed cash dividend whenever the position of the Company justifies such payment.

Liquidation and Preemptive Rights

Subject to the preferences applicable to holders of shares of our preferred stock, in the event of our voluntary or involuntary liquidation, dissolution or winding up, the holders of shares of our common stock will be entitled to share equally in any of the assets available for distribution after we have paid in full all of our debts.

Holders of common stock have no preemptive, subscription, redemption or conversion rights. The rights, preferences and privileges of holders of common stock are subject to, and may be adversely affected by, the rights of the holders of our outstanding Series B Preferred Stock and the shares of any other series of preferred stock that we may designate and issue in the future.

Voting Rights

The holders of shares of our common stock are entitled to notice of any shareholders' meeting in accordance with our bylaws and to one vote for each share held of record on all matters submitted to a vote of the shareholders.

Election and Removal of Directors

Except in the case of vacancies, each director is elected by the affirmative vote of a majority of the votes cast as the general meeting of our shareholders.

Our bylaws provide that any vacancies on the board of directors not filled at any general meeting will be deemed casual vacancies and the board of directors, so long as a quorum of directors remains in office, will have the power at any time and from time to time, to appoint any individual to be a director so as to fill a casual vacancy. A director so appointed will hold office only until the next following annual general meeting. If not reappointed at such annual general meeting, the director will vacate office at the conclusion of the annual general meeting.

Special Meetings of Shareholders

Special general meetings of our shareholders may be called (i) by our board of directors or (ii) when requisitioned by shareholders pursuant to the provisions of the Exchange Act.

Restrictions on Transfers of Shares of Common Stock

Our board of directors may in its absolute discretion, and without providing a reason, refuse to register the transfer of a share, which is not fully paid up. Our board of directors may also refuse to register a transfer unless the shares of common stock are (i) listed on an appointed stock exchange (of which the NYSE is one) or (ii) (A) a duly executed instrument of transfer is provided to us or our transfer agent accompanied by the certificate (if any has been issued) in respect of the shares to which it relates and by such other evidence as our board of directors may reasonably require to show the right of the transferor to make.

Transfer Agent and Registrar

Continental Trust Company, N.A. is the transfer agent and registrar for the common stock.

Listing

The common stock is quoted on the NYSE American under the trading symbol "EMAN".

Preferred Stock

We may issue shares of our preferred stock from time to time, in one or more series. Our board of directors will determine the rights, preferences and privileges of the shares of each wholly unissued series, and any qualifications, limitations or restrictions thereon, including dividend rights, conversion rights, preemptive rights, terms of redemption or repurchase, liquidation preferences, sinking fund terms and the number of shares constituting any series or the designation of any series. Our board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of the common stock. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deferring or preventing a change in control of the Company and may adversely affect the market price of the common stock and the voting and other rights of the holders of common stock.

Series B Preferred Stock

On December 19, 2008, we filed a Certificate of Designations with the State of Delaware, which designates 10,000 shares of our preferred stock as Series B Preferred Stock, of which 5,659 shares are issued and outstanding.

Dividends

The Series B Preferred Stock rank senior to our common stock as to payment of dividends and distribution of assets upon our liquidation, dissolution, or winding up, whether voluntary or involuntary. The holders of the Series B Preferred Stock are not entitled to receive dividends unless our board of directors declares a dividend for holders of the common stock and then the dividend shall be equal to the amount that such holder would have been entitled to receive if the holder converted its preferred stock into shares of common stock. The Series B Preferred Stock are not entitled to interest payments.

Conversion

Each share of Series B Preferred Stock has a stated value of \$1,000 and has a conversion price of \$0.75 per share. The Series B Preferred Stock does not pay interest.

Voting Rights

Each share of Series B Preferred Stock has voting rights equal to (i) the number of shares of common stock issuable upon conversion of such shares of Series B Preferred Stock at such time (determined without regard to the shares of common stock so issuable upon such conversion in respect of accrued and unpaid dividends on such share of Series B Preferred Stock) when the Series B Preferred Stock votes together with the common stock or any other class or series of our capital stock and (ii) one vote per share of preferred stock when such vote is not covered by the immediately preceding clause. Each holder of Series B Preferred Stock is entitled to notice of any shareholders' meeting in accordance with our bylaws and may vote with holders of common stock upon the election of directors and upon any other matter submitted to a vote of shareholders, except those matters required by law to be submitted to a vote of holders of our preferred stock or Series B Preferred Stock voting separately as a class or series, and except as provided in the certificate of designations for the Series B Preferred Stock. The affirmative vote or consent of the holders of a majority of the outstanding shares of Series B Preferred Stock (the "majority holders"), voting separately as a class, will be required for (1) any amendment, alteration, or repeal, whether by merger or consolidation or otherwise, of our certificate of incorporation if the amendment, alteration, or repeal materially and adversely affects the powers, preferences, or special rights of the Series B Preferred Stock, (2) the creation and issuance of any Senior Dividend Stock or Senior Liquidation Stock (each, as defined in the certificate of designations), (3) the redemption of or payment of dividends on, any class or series of our capital stock or (4) any sale, lease or conveyance of all or substantially all of our assets, or any merger, consolidation, or business combination with any other person or any liquidation, dissolution or winding up of the Company.

In addition, the terms of the certificate of designations also provide that so long as any shares of Series B Preferred Stock are outstanding, we may not offer, sell or issue, or enter into any agreement, arrangement or understanding to offer, sell or issue, any common stock or common stock equivalent (other than offerings that are underwritten on a firm commitment basis and registered with the SEC under the Securities Act of 1933, as amended) or engage in certain other financings and/or capital raises without the approval of majority holders. These and other rights granted to holders of the Series B Preferred Stock pursuant to the certificate of designations and the securities purchase agreement governing the sale of the Series B Preferred Stock enable the holders thereof to exert substantial control over our affairs and potentially exercise their control in a manner adverse to the interest of holders of our common stock.

The General Corporation Law of the State of Delaware, the state of our incorporation, provides that the holders of Series B Preferred Stock will have the right to vote separately as a class (or, in some cases, as a series) on an amendment to the certificate of incorporation if the amendment would change the par value, the number of authorized shares of the class or the powers, preferences or special rights of the class or series so as to adversely affect the class or series, as the case may be. This right is in addition to any voting rights that may be provided for in the applicable certificate of designation.

Liquidation Rights

In the event of our liquidation, dissolution, or winding up, the Series B Preferred Stock is entitled to receive liquidation preference before the common stock. We may at our option redeem the Series B Preferred stock by providing the required notice to the holders of the Series B Preferred Stock and paying an amount equal to \$1,000 multiplied by the number of shares for all of such holder's shares of outstanding Series B Preferred Stock to be redeemed.

Delaware Law and Certain Charter and Bylaw Provisions

Provisions of Delaware law, our certificate of incorporation and our bylaws may discourage, delay or prevent a merger, acquisition or other change in control that stockholders may consider favorable. These provisions may also prevent or delay attempts by stockholders to replace or remove our current management or members of our board of directors. These provisions include:

- limitations on the removal of directors;
- advance notice requirements for stockholder proposals and nominations;
- the inability of stockholders to act by written consent or to call special meetings;
- the ability of our board of directors to make, alter or repeal our bylaws; and
- the authority of our board of directors to issue preferred stock with such terms as our board of directors may determine.

In addition, we are subject to the provisions of Section 203 of the DGCL. Section 203 prohibits a publicly-held Delaware corporation from engaging in a "business combination" with an "interested stockholder" for a period of three years after the person became an interested stockholder, unless the business combination is approved in a prescribed manner. A "business combination" includes mergers, asset sales and other transactions resulting in a financial benefit to the interested stockholder. Subject to certain exceptions, an "interested stockholder" is a person who, together with affiliates and associates, owns, or within the prior three years did own, 15% or more of the corporation's voting stock.

Subsidiaries of the Company

Virtual Vision, Inc. formed in the State of Delaware

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the Registration Statements , on Form S-1, as amended (No. 333-222375), on Form S-1MEF (No. 333-222682), on Form S-8 (Nos. 333-189300, 333-219968, 333-235672, and 333-179219), and on Form S-3 (Nos. 333-215261 and 333-218839) of eMagin Corporation of our report dated March 11, 2020, relating to the consolidated financial statements of eMagin Corporation, appearing in this Annual Report on Form 10-K of eMagin Corporation for the year ended December 31, 2019.

/s/ RSM US LLP

Stamford, Connecticut
March 11, 2020

**CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO SECTION 302 OF THE
SARBANES-OXLEY ACT OF 2002**

I, Andrew G. Sculley, certify that:

1. I have reviewed this annual report on Form 10-K of eMagin Corporation.
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 periods 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 registrant as of, and for, the periods presented in this report;
4. The registrant'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 registrant 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 registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the periods 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 registrant'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 registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal controls over financial reporting which are reasonably likely to adversely affect the registrant'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 registrant's internal controls over financial reporting.

By: /s/ Andrew G. Sculley
Andrew G. Sculley
Chief Executive Officer
(Principal Executive Officer)

Dated: March 11, 2020

**CERTIFICATION OF PRINCIPAL FINANCIAL AND ACCOUNTING OFFICER
PURSUANT TO SECTION 302 OF THE
SARBANES-OXLEY ACT OF 2002**

I, Mark A. Koch, certify that:

1. I have reviewed this annual report on Form 10-K of eMagin Corporation.
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 periods 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 registrant as of, and for, the periods presented in this report;
4. The registrant'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 registrant 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 registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the periods 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 registrant'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 registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal controls over financial reporting which are reasonably likely to adversely affect the registrant'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 registrant's internal controls over financial reporting.

Dated: March 11, 2020

By: /s/ Mark A. Koch

Mark A. Koch
Acting Chief Financial Officer
(Principal Accounting and Financial Officer)

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report of eMagin Corporation (the "Company") on Form 10-K for the period ended December 31, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Andrew G. Sculley, Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- (1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

The foregoing certification is being furnished solely to accompany the Report pursuant to 18 U.S.C. section 1350 and is not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and is not to be incorporated by reference into any filing of the Company, whether made before or after the date hereof, regardless of any general incorporation language in such filing.

By: /s/ Andrew G. Sculley
Andrew G. Sculley
Chief Executive Officer
(Principal Executive Officer)

Dated: March 11, 2020

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report of eMagin Corporation (the "Company") on Form 10-K for the period ended December 31, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Mark A. Koch, Acting Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- (1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

The foregoing certification is being furnished solely to accompany the Report pursuant to 18 U.S.C. section 1350 and is not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and is not to be incorporated by reference into any filing of the Company, whether made before or after the date hereof, regardless of any general incorporation language in such filing.

By: /s/ Mark A. Koch

Mark A. Koch
Acting Chief Financial Officer
(Principal Accounting and Financial
Officer)

Dated: March 11, 2020
