

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, 2021

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 (§ 232.405 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, a 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	<input type="checkbox"/>	Smaller Reporting Company	<input checked="" type="checkbox"/>
Accelerated filer	<input type="checkbox"/>	Emerging growth company	<input type="checkbox"/>
Non-accelerated filer	<input checked="" type="checkbox"/>		

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 has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report.

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, 2021, 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 \$3.48 was approximately \$235.8 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 1, 2022 was 72,979,479.

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 2022, 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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STATEMENT REGARDING FORWARD-LOOKING STATEMENTS

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. 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 financing when 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 ability to maintain our operations as a result of potential employee, customer and supplier disruptions caused by the COVID-19 pandemic or any resurgences and quarantine restrictions;
- our anticipated cash needs and our estimates regarding our capital requirements;
- our ability to repay our indebtedness pursuant to the asset based lending, or ABL facility;
- 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 augmented reality/virtual reality, or 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 impact of the majority holder of our Series B convertible stock, being able to prevent us from entering into significant corporate transactions, including certain capital raising transactions;
- changes in demand by original equipment manufacturer or 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;
- our ability to comply with the terms of government awards; and
- provisions in certain of our organizational documents, commercial agreements, government awards, and our military contracts that may prevent or delay an acquisition of, partnership with, or investment in us and our ability to develop original equipment manufacturer and mass production partnerships.

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

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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,” “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 former consumer night vision products business, which we exited in 2018.

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

Summary of Risk Factors

We are providing the following summary of the risk factors contained in this Annual Report on Form 10-K to enhance the readability and accessibility of our risk factor disclosures. We encourage you to carefully review the full risk factors contained in this Annual Report on Form 10-K in their entirety for additional information regarding the material factors that make an investment in our securities speculative or risky. These risks and uncertainties include, but are not limited to, the following:

Risks related to our financial position, including risks relating to:

- our ability to continue as a going concern;
- our ability to generate revenue or obtain financing to mitigate the going concern risk;
- our ability to meet obligations and continue our current level of operations; and
- uncertainty regarding our ability to obtain additional capital funding.

Risks related to our business and industry, including risks relating to:

- the impact of significant fluctuations in our operating results;
- the impact of production challenges on our ability to deliver against orders or introduce new products;
- dependence on critical machines and tools that can break down and impact production;
- reliance on sole and limited source suppliers;
- the impact of supply chain shortages and increased demand;
- the impact of inflation on our production costs, revenue, and profit margins;
- the impact of the COVID-19 pandemic on our business;
- the impact of material requirements planning on demand and capacity;
- the variability of production yields;
- demand changes due to economic conditions, governmental regulations and alternative technologies;
- the highly competitive nature of the display industry;
- advantages our competitors have over us;
- variations in cyclical demand;
- product sales that are subject to lengthy OEM development periods;
- the need to develop new products or enhancements to maintain or improve our profit margins;
- the impact of a failure to develop and maintain relationships with companies that use our technology;
- the variability of our military and commercial contract revenue and future licensing revenue;
- the dependency of our AR/VR display development efforts on overall acceptance of AR/VR systems in the marketplace;
- the speed of development of the market segments for consumer and commercial AR/VR systems; and
- the impact of rescheduling and or/ cancellations of orders to our backlog.

Risks related to ownership of our common stock, including risks related to:

- the volatility in the market price of our common stock;
- share price risk related to provisions in agreements limit our ability to engage in mergers and acquisitions;
- risks related to maintaining or losing our NYSE American listing;
- the potential dilutive impact of future issuance of additional shares of common stock;
- the expectation that we will not pay dividends in the foreseeable future;
- the nature and content of public research reports about us;
- the impact of anti-takeover provisions in our governing documents and under Delaware law;
- the ability of Series B convertible preferred stockholders to hinder a change in control that might increase our market price;
- the ability of Series B convertible preferred stockholders to block transactions that might benefit our share price;
- the potential impact on our share price of sales of large blocks of our common stock held by the Series B convertible preferred stockholders; and

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the impact of any failure to maintain effective internal controls and governance standards.

Risks related to our indebtedness, including risks relating to:

asset based lending, or ABL facility covenants that impose operating and financial restrictions;
risks related to repayment of ABL facility;
the potential impact of non-renewal of the ABL facility; and
the impact of variable rate provisions on our debt service obligations and interest expense.

Risks related to our intellectual property, including risks related to:

protection of our patents and technology;
intellectual property risks from conducting business in foreign jurisdictions;
changes to patent law; and
the potential impact of defending third party claims against us.

Risks related to governmental, legal or regulatory matters, including risks related to:

the impact of changes in federal budget priorities on display revenue;
the impact of changes in federal budget priorities on research and development, or R&D, contract revenue;
the impact of governmental and customer's bid process on our revenues and profits;
our ability to obtain government funding and perform under award conditions;
the impact of compliance with U.S. government procurement laws and regulations;
the impact of compliance with economic sanctions, export control laws, and related regulations; and
compliance with environmental regulations and possible liability.

Risks related to Information Technology, including risks related to:

the reliance of our business on our Information Technology systems; and
the impact of a potential security breach on our business.

General risks, including risks relating to:

our ability to attract and retain key personnel;
economic conditions may adversely impact our business;
risks related to international transactions;
risks related to product liability claims; and
the impact of changes in accounting principle on our reported financial results.

PART I

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. We are one of the leading U.S. producers of OLED microdisplays and manufacture our products at our facility located in the Hudson Valley of New York State. 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, consumer and commercial markets to develop and market improved or new electronic products. We believe our Direct Patterning Technology, or dPd™, could significantly transform the way the world consumes information. Since 2001, our microdisplays have been used in AR/VR, aircraft helmets, heads-up display systems, thermal scopes, night vision goggles, weapon systems and a variety of other applications.

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 45 issued U.S. patents and 13 pending U.S. patent applications, and have over 20 years of manufacturing know-how and other proprietary technologies to create our high-performance OLED microdisplays. We also have 16 issued foreign patents and 10 pending foreign patent applications. 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.

Consumer, commercial (in which we include the medical and industrial sectors), and military customers are increasingly turning to us because of our technological leadership in display brightness and resolution. This leadership in brightness is further demonstrated by our proprietary dPd capability. Unlike traditional OLED microdisplays that produce colors by using a white source with filters that eliminate about 80% of the emitted light, with dPd we make full color displays by directly depositing each of the primary color materials on respective sub-pixels, without the use of filters. We have fabricated full color displays, including our 4kX4k and WUXGA displays using our dPd tool, which was newly upgraded and installed during 2021. In July 2021, using our dPd technology we created full color WUXGA displays with a brightness of over 10,000 cd/m², which we demonstrated to industry analysts in October 2021. We expect to achieve a brightness level of over 28,000 cd/m² ready for mass production of full color displays by 2023. We achieved the highest monochrome brightness levels in the market years ago and are continuing our leadership with color displays. Display brightness is critical for AR/VR devices because of optics inefficiency and the need to eliminate motion artifacts. This is especially important for heads up displays used in bright, daylight environments. Our high resolution and small pixel pitch are also important to eliminate the “screen door” effect that comes with expanding lower resolution displays over wide fields of view. We continue our development work for a tier-one consumer electronics company customer and are targeting similar levels of brightness on proof-of-concept displays using our full color dPd process.

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. And finally, as the technology leader in this space, we may see future opportunities to license technologies like dPd to OEMs and other global manufacturers.

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.

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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 some 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 split 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 very bright OLED microdisplays using our patented dPd technology and have demonstrated color high resolution 4K x 4K displays and widescreen ultra-extended graphics array, or WUXGA, microdisplays with brightness in excess of 10,000 nits, which we believe is the world's highest resolution and brightness OLED microdisplay. 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 eMagin is the only U.S. manufacturer of OLED microdisplays. 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 dimmable for nighttime light security. OLED microdisplays possess

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performance characteristics important to demanding military and commercial (e.g., industrial and medical) 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 2022, we expect to sell displays under a program with a prime contractor to support the F-35 Lightning II helmet mounted display systems. These custom designed OLED displays are a key component in providing enhanced contrast and projection of images and symbology display as compared to LCD technology.

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 Binocular (ENVG-B), Enhanced Night Vision Goggle II, the Enhanced Night Vision Goggle III, the Javelin CLU medium-range anti-tank missile system, Thermal weapons sights, 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 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, AMO Wavefront, IMV (formerly BCF), Liteye, Trijicon, FLIR Systems, and Nordic NeuroLab.

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 and immersive content 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;

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AR 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 market includes developing partnerships with both tier-one consumer companies and high-volume production manufacturing companies.

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; nighttime 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 x 2K displays in its consumer headsets. In first quarter 2017, we entered into an agreement with an additional 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. During 2019, we demonstrated a 4K display at a major industry conference. During 2020, we entered into an agreement with another tier-one consumer company to design a display. During 2021, we demonstrated a new prototype for a widescreen ultra-extended graphics array (WUXGA) (1920x1200 pixels) that uses our dPd technology to achieve 10,000 candela per square meter (cd/m²) of maximum luminance, which we believe is the world's brightest high-resolution, full-color OLED microdisplays.

Our Products

Our first commercial microdisplay, the super video graphics array, or SVGA+, Active Matrix 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 2010, we introduced the VGA microdisplay. 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 SXGA096, as well as an upgrade to the SXGA120 and WUXGA displays. 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 x 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. Following the upgrade, we received the tool back from the vendor and began fabricating dPd prototypes during the second half of 2020 and have sent samples to customers for evaluation. During 2021, we achieved full color brightness levels of over 10,000 cd/m² on WUXGA displays which were demonstrated to industry analysts, and exhibited at a tradeshow in customer headsets. After receipt and qualification of an advanced dPd tool which we purchased with the help of government grants, we expect to achieve a brightness level of over 28,000 cd/m² ready for mass production of full color displays by 2023. During 2021 we completed the manufacturing qualification process for our high-luminance and power-efficient XLE displays and began to ramp production to meet customer demand. Our current XLE displays are qualified at over 1,500 cd/m². These displays use eMagin's existing backplane and are compatible with designs used by many customers, thereby providing an upgrade in luminance levels. Several of the display types listed below are currently available in XLE luminance levels.

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 for full color video.

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Digital SVGA OLED-XL (800x600)

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/XLE (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.

SXGA-120 (Super eXtended Graphics Array, 1292 x 1200)

Our SXGA-120 active array microdisplay is comprised of 1292 x 1036 square pixels with a 12-micron pitch and a 69% fill factor. An extra 12 columns and 12 rows (beyond the 1280 x 1024 main array) are provided to enable the active SXGA-120 display to be shifted by steps of 1 or 2 pixels in the X and Y directions for optical alignment purposes. The SXGA-120 is well suited to use in Weapon and Night Vision Systems using an FPGA and a SXGA or 720P camera source. It shares compatibility with the VGA display allowing for a common drive platform. It is also suitable for use in HMD's requiring a balance between display size and FOV having a large pixel size making wider FOV easier to accomplish.

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. 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. Each full pixel is laid out as three 3.2 x 9.6 micron identical sub-pixels, which together form the 9.6-micron square RGB color group. 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. On-board circuitry ensures consistent color and brightness over a wide range of operating temperatures.

2K x 2K Display (2048 x 2048)

The 2Kx2K Reconfigurable Color OLED-XL (2K_CFXL) active array is comprised of 2072 x 2072 square color pixels with a 9.3-micron pitch and a 75% fill factor. An extra 24 columns and 24 rows (beyond the 2048 x 2048 main array) are provided to enable the 2K_CFXL display to be shifted by steps of 1 pixel in the X and Y directions for optical alignment purposes. Each full pixel is laid out as three 3.1 x 9.3 micron identical sub-pixels, which together form the 9.3-micron square RGB color group. Three primary color filter stripes are applied in alignment with the sub-pixels on a white-emissive OLED layer to form the color display. The 2K is intended for near-to-eye applications that demand high brightness, high resolution, high image quality, compact size, and low power such as virtual reality and avionics systems.

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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. Additionally, we provide license-free source code for these kits (Firmware and FPGA Verilog) to enable our customer to accelerate their time to market.

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.

Drive Boards

Through an agreement with Bild Innovative Technology we offer its line of OLED microdisplay compact driver boards to eMagin customers. Under this arrangement, customers now have the option of purchasing eMagin OLED microdisplays together with compact drive boards, thereby streamlining their prototyping efforts. The initial boards available from eMagin will be for SXGA096, SXGA120, and DSVGA resolutions, with more to be added in the future.

Government Contract Revenues and Government Awards

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 addition, we have applied for and received U.S. government awards for the purchase of capital equipment.

In June 2020, we announced a \$5.5 million award received under the U.S. Department of Defense Industrial Base Analysis, or IBAS, Program for OLED Supply Chain Assurance. In July 2020, we announced a \$33.6 million award the U.S. Department of Defense to sustain and enhance U.S. domestic capability for high resolution, high brightness OLED microdisplays that will include equipment to manufacture our dPd displays. These funds will be used to purchase capital equipment over a 33 month period that will increase capacity, improve yields, and sustain operations at our Hopewell Junction, New York headquarters.

During 2021, we made progress towards our goals of securing new U.S. military programs, broadening our presence in foreign military applications, we continue to participate in discussions with the U.S. government 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 earn revenue from contracts with the U.S. government, either directly or funded through contractors that 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.

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 2021, our efforts towards consumer AR/VR applications continued. We were also awarded several contracts to fund our efforts to improve production yields and OLED device performance in 2020.

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 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

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customers serving a variety of markets, including military, 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. Capitalizing on this strategy, in 2020, we received U.S. Department of Defense awards to procure capital equipment to enhance our manufacturing capabilities to produce OLED microdisplays used in several key military programs.

Strengthen our technology leadership. Our advanced backplane designs, intellectual property portfolio coupled with our OLED fabrication techniques and know-how, and 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. With the help of equipment to be provided under our U.S. government awards, we intend to reduce our production costs primarily by improving manufacturing yields, eliminate single point of failure equipment, lower fixed costs through reduced cycle time and increased automation. The U.S. government awards will also enable us to procure a dPd tool capable of producing production quantities of these high-brightness, high-resolution displays. 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 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 U.S. military and have received technology achievement awards from the U.S. 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; the Association of the United States Army, or 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.

Expand into new display markets. In the future, technologies like dPd combined with our advanced backplane design capability may open the door to enabling improvements over both traditional displays outside the microdisplay market, including cell

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phones and other larger scale displays, as well as improving the feasibility of emerging display technologies like microLED.

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, New York facilities. We also utilize distributors in Asia and Korea.

An OEM design cycle typically requires between 6 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,	
	2021	2020
Military	66 %	73 %
Commercial, including industrial and medical	11 %	6 %
Consumer	7 %	11 %
Multiple	16 %	10 %
Total	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,	
	2021	2020
United States	61 %	56 %
International	39 %	44 %

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Backlog

As of December 31, 2021, we had a backlog of approximately \$13.8 million, an increase of approximately \$2.9 million over the backlog of \$10.9 million at December 31, 2020. Backlog is comprised of scheduled delivery dates through 2022 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, New York. We currently lease approximately 63,000 square feet of space, which houses our 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. At the end of the lease term we have two five-year options to extend the lease.

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 employ a variety of specialized equipment in our manufacturing processes, including anode organic deposition tools, various sealing equipment, dicers, wire bonding equipment, heat testing ovens, and others.

We believe manufacturing efficiency is an important factor for success, across all of our markets. As previously announced, we have been designing, specifying, and ordering advanced OLED manufacturing equipment under our \$34.0 million in Defense Production Act Title III funding and \$5.0 million IBAS funding grants. We have placed orders for all major pieces of equipment funded by these programs, including an order for an advanced, production-capable dPd organic deposition tool that is expected to improve yield and throughput of this innovative technology by the end of 2023. Overall, the Company remains on track and within requirements of the U.S. Defense Production Act Title III and IBAS funding grants and anticipate improvements in manufacturing yield and reliability over the next 24 months as this equipment is qualified and added to the production line. The new equipment will help us increase capacity and yield for all display types, address critical production points, and replace certain older equipment, which we expect will aid us in meeting expected demand for our microdisplays.

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 OLIGHTEK 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, there are several manufacturing facilities in China to build OLED microdisplays for the consumer AR/VR marketplace that came online. 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 include:

our ability to design, manufacture and deliver new products, including those implementing dPd, on a timely basis;

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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 45 issued U.S. patents and 13 pending U.S. patent applications. We also have 16 issued foreign patents and 10 pending foreign patent applications. 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 data rights to some of our technology as a result of its funding a 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.

U.S. 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, or BIS, 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

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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, 2021, we had a total of 103 employees, of which 101 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.

Human Capital

Oversight and Management

Our Human Resources organization is tasked with leading our organization in managing employment-related matters, including recruiting and hiring, onboarding and training, compensation planning, talent management and development. We are committed to providing team members with the training and resources necessary to continually strengthen their skills. Our executive team is responsible for periodically reviewing team member programs and initiatives, including healthcare and other benefits, as well as our management development and succession planning practices. Management periodically reports to the Board and its committee's human capital measures and results that guide how we attract, retain and develop a workforce to enable our business strategies.

Diversity, Equity and Inclusion

We believe that a diverse workforce is critical to our success, and we continue to monitor and improve the application of our hiring, retention, compensation and advancement processes for women and underrepresented populations across our workforce, including our team members of color, veterans and LGBTQ to enhance our inclusive and diverse culture. We continue to invest in recruiting diverse talent.

We strive to have a diverse culture of employees representing different genders, ages, ethnicities, sexual orientation, gender identity and abilities.

Workplace Safety and Health

A vital part of our business is providing our workforce with a safe, healthy and sustainable working environment. Our Environmental, Health and Safety program focuses on implementing change through employee observation and feedback channels to recognize risk and continuously improve our processes, as well as conducting regular risk reviews and self-audits at our manufacturing facility to explore new opportunities to reduce potential employee exposure to occupational injuries.

Importantly during 2021, our experience and continuing focus on workplace safety have enabled us to preserve business continuity without sacrificing our commitment to keeping our colleagues and workplace visitors safe during the COVID-19 pandemic. At the onset of the pandemic we established a team to monitor new COVID-19 related developments and support our operations to respond to the ever-changing landscape.

The team consists of our Executive Management team, Human Resources, Manufacturing, IT, and Safety, and provides updates to the Board of Directors. The team's goals are to:

- support safe working environments in our operations;
- regularly communicate to inform and update employees; and
- provide oversight of training on COVID-19 safety practices.

We took immediate action at the onset of the COVID-19 pandemic to enact rigorous safety protocols in our facilities by improving sanitation measures, implementing mandatory social distancing, temperature screening, use of facing coverings, reducing on-site staff through staggered shifts and schedules, remote working where possible, and restricting visitor access to our locations. These actions, in addition to generally being deemed an essential business, have enabled us to continue operating our business with minimal disruptions during the pandemic.

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

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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, <https://www.emagin.com/investors/corporate-governance>, the charters of our Audit, Compensation, Governance and Nominating committees, our Code of Business Conduct and 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.

ITEM 1A. RISK FACTORS

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, 2021 that includes an explanatory paragraph referring to our negative cash flow and recurring losses from operations, which raises substantial doubt about our 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 for the twelve months from the issuance date of those financial statements. 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 \$5.2 million and \$11.4 million for the years ended December 31, 2021 and 2020, respectively. As of December 31, 2021 we had an accumulated deficit of \$257 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 will 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 to remediate manufacturing issues that have resulted in production delays; integrate new equipment on our manufacturing line, including equipment provided under government awards, 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, 2021, the Company had \$5.7 million of cash, \$2.0 million of outstanding indebtedness and borrowing availability of \$2.3 million under its ABL Facility.

Our cash position as of December 31, 2021 reflects the receipt of approximately \$0.2 million in net proceeds from sales of our common shares under an at-the-market, or ATM facility entered into in November 2021. 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 sufficient revenue or secure additional external financing when 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. 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, 2021 we had \$2.0 million in borrowings outstanding, and unused borrowing availability of \$2.3 million, under our ABL Facility.

We incurred net losses of \$5.2 million and \$11.4 million for the years ended December 31, 2021 and 2020, respectively. Net cash used in operating activities for the years ended December 31, 2021 and 2020 was \$7.4 million and \$4.9 million, respectively. As of December 31, 2021, we had cash and cash equivalents of \$5.7 million, net working capital of \$11.8 million, accounts payable of \$1.3 million and an accumulated deficit of \$257 million. If we are unable to generate sufficient revenue or secure additional external financing when required we may have to curtail our operations or cease our development plans and operations.

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.

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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 first quarter of 2023. 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 first quarter of 2023, 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, 2022. Although relations 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 2022 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 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 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 ability to raise additional funding, 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 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 us. 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. In addition, there can be no assurances that the majority holder of our Series B convertible preferred stock, will not withhold its consent for any future capital raise we propose. See "The holders of shares of our Series B convertible preferred stock have exercised, and may continue to exercise, significant influence over us." 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.

Risks Related To Our Business and Industry

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:

- demand for our products;
- the receipt and timing of orders and the timing of delivery of orders;
- the amount of R&D contract or nonrecurring engineering work we may have in a given year;
- 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;

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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.

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 2020 and 2021, and also had delays in getting vendor support personnel due to COVID-19 travel restrictions during 2021. While we are continually making improvements in production processes; 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.

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 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. 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.

Semiconductor industry supply chain shortages and increased demand may reduce the availability of raw materials we need for production and have led to longer lead times and increased material costs. If we are unable to purchase sufficient quantities of raw materials at acceptable prices, we may be unable to meet demand for our products in a timely manner or within budget.

Currently, the semiconductor industry is experiencing supply chain shortages, which have impacted our semiconductor industry suppliers' ability to provide us with the raw materials in the amounts we require for production. Shortages in the semiconductor industry, whether due to capacity constraints, ongoing supply chain disruptions, or natural disasters, adversely affect our ability to manufacture microdisplays. Our inability to obtain 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 business, financial condition, and results of operations.

Prolonged inflation and supply chain disruptions could result in lost revenue, higher costs and decreased profit margins.

Recent inflationary pressures have resulted in the increased cost of raw materials we use in the production of our products. Rising prices for not only raw materials, but also semiconductor chips, freight, packaging, labor and energy, increases the costs to manufacture and distribute our products. In addition, we have experienced shortages in certain raw materials and component inputs of our products, some suppliers have been unable to meet delivery schedules due to excess demand and labor shortages, and lead times have lengthened throughout our supply chain. Our efforts to mitigate supply chain weaknesses may not be successful or may have unfavorable effects. For example, efforts to purchase raw materials in advance for product manufacturing may result in increased storage costs or excess supply. If our costs continue to rise due to continuing significant inflationary pressures or supply chain disruptions, we may not be able to fully offset such higher costs through price increases. In addition, delays in obtaining materials from our suppliers could result in lost opportunities to sell our products due to their availability. Increased costs and decreased product availability due to supply chain issues could adversely impact our revenue and/or gross margin, and could thereby harm our business, financial condition, and results of operation.

The COVID-19 pandemic has affected our business and could materially adversely affect our financial condition and results of operations and ability to continue as a going concern.

The COVID-19 pandemic has resulted in authorities imposing, and businesses and individuals implementing, numerous unprecedented measures to try to contain the virus, such as travel bans and restrictions, quarantines, shelter-in-place/stay-at-home and social distancing orders, and shutdowns. These measures have impacted and may further impact our workforce and operations, the operations of our customers, and those of our respective vendors, suppliers, and partners.

The COVID-19 pandemic has impacted our business. We have experienced occasional production disruptions related to the unwillingness or inability of certain of our equipment repair vendors to travel to our facility, the temporary loss of services of employees quarantined due to COVID-19 and delays in the supply of raw materials caused by disruptions due to COVID-19. Any period of interrupted access to our manufacturing facilities or our workforce, or similar limitations for our vendors and suppliers, can impact our ability to meet customer demand and could have a material adverse effect on our financial condition and results of operations, particularly if prolonged. In addition, if we are unable to continue regularly scheduled maintenance of our manufacturing equipment, our manufacturing capabilities may be negatively impacted and we may experience further unscheduled closures and/or production disruptions, which could have a material adverse effect on our financial condition and results of operations.

Due to the measures implemented to contain the COVID-19 outbreak, our suppliers, located both inside and outside of the United States, may have limited supplies of, or may be unable to produce, the components we use to manufacture our products. Any significant disruption in the supply of such components could impair our ability to satisfy customer orders, which could have a material adverse effect on our financial condition and results of operations.

Certain of our customers have experienced, and may continue to experience, disruptions in their operations and supply chains, which can result in delayed, reduced, or canceled orders, or collection risks, and which may adversely affect our results of operations. Any existing or future delays, reductions or cancellation of orders from our customers military, commercial or consumer market customers may adversely affect our results of operations.

COVID-19 has caused us to modify our business practices (including employee travel, employee work locations, cancellation of physical participation in meetings, events and conferences, and social distancing measures), and we may take further actions as may be required by government authorities or that we determine are in the best interests of our employees, customers, partners, vendors, and suppliers. Work-from-home and other measures introduce additional operational risks, including cybersecurity risks, and have affected the way we conduct our activities, which could have an adverse effect on our operations. Due to the increase in employees working from home and accessing our network and systems remotely, we face increased risk of security breaches and other disruptions which could compromise our information technology systems, and expose to liability, theft of sensitive data or damage to our reputation. There is no certainty that such measures will be sufficient to mitigate the risks posed by the virus, and future employee virus or workforce disruptions could lead to unavailability of key personnel and harm our ability to perform critical functions. In addition, our ability to attract, recruit and retain highly skilled and qualified technical and consulting personnel or other employees may be impacted by COVID-19 travel restrictions, and other COVID-19 health concerns related to relocation on the part of potential employees and their families.

The pandemic has significantly increased economic and demand uncertainty. It is possible that the current outbreak and continued spread of COVID-19, and any resurgence related to the Omicron variant, or other vaccine resistant strains, will cause the economic slowdown to continue, and it is possible that it could cause a global recession. Although vaccines are becoming more widely available, there is a significant degree of uncertainty and lack of visibility as to the extent and duration of the COVID-19 pandemic and related slowdowns or economic trends. Although demand for the Company's products has remained steady, the Company's inability to obtain components and other materials or services on a timely basis has resulted in manufacturing delays, increased costs, and in reduced or delayed sales. If these trends worsen or result in lost orders it could materially and adversely affect our business, financial condition, and results of operations. Although many jurisdictions are now open with social distancing measures implemented to curtail the spread of COVID-19,

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we cannot predict the length of time that it will take for our supply chain to be restored and any meaningful economic recovery to take place. We also cannot predict whether the Omicron variant or other vaccine resistant strains will lead to additional surges in new cases of COVID-19, or the severity of such surges if/when they occur, such that governmental authorities decide to reimpose quarantines, lockdowns or travel restrictions, which could further materially and adversely affect our results and financial condition. It is also not possible to predict with certainty the impact of executive orders providing for mandatory COVID-19 vaccinations will have on our workforce. Our implementation of these requirements may result in attrition, including attrition of critically skilled labor, and difficulty securing future labor needs, which could have a material adverse effect on our business, financial condition, and results of operations.

We have experienced occasional delays in product shipments, which may be exacerbated if there are additional surges of quarantines, lockdowns or travel restrictions are re-imposed or heightened. There is no assurance that our operations will not be further disrupted in the future by additional impacts of the COVID-19 virus or any resurgences, on either our internal operations or those of our suppliers or customers, including the possible impact of travel restrictions on key support personnel for our critical production equipment. A continued economic slowdown could adversely affect our business in 2022. Given the significant economic uncertainty and volatility created by the pandemic, it is difficult to predict the nature and extent of the impact on demand for our products. These expectations are subject to change without warning and investors are cautioned not to place undue reliance on them. Unanticipated consequences of the pandemic and resulting economic uncertainty could adversely affect our liquidity and capital resources in the future as well as our ability to continue as a going concern.

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 fiscal years 2019, 2020 and 2021 we experienced low production yields and output and an adverse impact on our gross margins and operating results due to equipment failures.

Demand for our products is dependent on economic conditions, changes in government regulation and could be impacted by alternative display technologies.

Historically, approximately 8% 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

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products.

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 levels may increase if we build products to meet an 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.

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

Our prospects could be significantly affected by our ability to maintain and develop strategic alliances with tier-one consumer companies and 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 military and commercial contract revenue is variable and dependent on a small number of customers. The continuation of our consumer contract revenue and our goal of developing a licensing revenue stream using our dPd and other display technology is subject to many risks and uncertainties.

Our military and commercial contract revenue is historically comprised of a small number of customers and can vary significantly from year to year. Specifically, our military and commercial contract revenue has varied from \$2.1 million in the year ended December 31,

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2019, to \$4.4 million in the year ended December 31, 2020, to \$1.9 million in the year ended December 31, 2021. Our prospects for commercial contract revenue are dependent on the market and technology for AR/VR systems which is in its early stages. Industry players are evaluating numerous display alternatives including OLED microdisplays, LCOS displays, smartphone screens and other display technologies. Numerous AR/VR devices are presently available in the marketplace and beginning to gain acceptance. Our 2021 commercial contract revenue primarily relates to work with a tier-one consumer customer that is presently in the development and proof of concept stages. In the event that companies with which we are not engaged launch AR/VR devices that gain widespread market acceptance, continued business with us may not serve the strategic interests of our present or future consumer customers. This consumer customer may not be satisfied with the performance of our dPd displays and terminate their development process with us, or choose to use OLED microdisplays produced by a competing company, or alternative display technologies. In the event we were no longer engaged in OLED microdisplay development for consumer companies, if this customer were to terminate its development process with us or if we were to lose other commercial or military contract revenue, our business and operating results could be adversely affected.

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

Although we believe our displays are suitable for AR/VR systems and products that 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 displays and dPd technology for AR/VR hardware. We are unable to predict when or if customers will choose to incorporate our displays into their AR/VR hardware, or if consumers will accept their systems. In addition, even if consumers accept AR/VR products, manufacturers may choose to manufacture systems using our competitors' displays, or their own in-house display designs. Our success in commercializing and licensing our dPd displays suitable for AR/VR products is important in our ability to achieve positive cash flow and profitability. If we are unable to commercialize our dPd displays for AR/VR products, we may be unable to increase revenues or achieve profitability or positive cash flow.

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

We seek to partner with companies to develop widespread market acceptance of our displays and related 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 AR/VR systems and products using our displays. 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 using our displays from gaining widespread market acceptance.

Amounts included in our backlog may not result in actual revenue or translate into profits. Our backlog is subject to rescheduling and/or cancellation and is, therefore an uncertain indicator of future operating results.

As of December 31, 2021, we had a backlog of approximately \$13.8 million, an increase of approximately \$2.9 million over the backlog of \$10.9 million at December 31, 2020. Backlog is comprised of scheduled delivery dates through 2022 of non-binding customer purchase orders and purchase agreements. Our backlog may vary depending upon the timing of when orders are received and shipment dates scheduled. 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. We have experienced postponements, cancellations and reductions in expected purchase orders due to changes in our customers' spending plans, market volatility, regulatory delays and/or other factors, including the impact of the COVID-19 pandemic and our inability to meet customer demand due to unexpected down time of our manufacturing equipment. There can be no assurance as to our customers' requirements, our ability to meet customer demands, or that actual purchases will be consistent with our stated backlog. As a result, our backlog as of any particular date is an uncertain indicator of future revenue and earnings. If any significant portion of our backlog fails to materialize, our results of operations, cash flows and liquidity would be materially and adversely affected.

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 \$1.17 to a high of \$4.84. 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 by our existing shareholders;
- 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 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.

Provisions in certain of our commercial agreements and our military business may prevent or delay an acquisition of partnership with, or investment in us, 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.

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.

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.

In addition, we notified the holders of our Series B convertible preferred stock that the \$0.75 conversion price was reduced to \$0.3022 due to sales of our common stock in December 2019, as required by a dilution provision in the related Series B preferred stock agreements. As a result, the number of shares of common stock issuable upon the conversion of the Series B preferred stock was increased from 7.5 million to 18.3 million shares. If the holders of the Series B convertible preferred stock sell any or all of the common

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stock issuable upon conversion of the Series B convertible preferred stock, this could have a material adverse effect on 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.

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 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

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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 majority holder of our Series B convertible stock, has prevented, and may in the future prevent, us from entering into significant corporate transactions that our management and Board have otherwise approved, including certain capital raising transactions.

The consent requirements set forth in the certificate of designations has impaired, and may in the future impair, our ability to enter into significant corporate transactions, including certain capital raising transactions. For example, the securities purchase agreement pursuant to which we sold the Series B convertible preferred stock provides that so long as there are holders of at least 577 outstanding shares of Series B convertible preferred stock and until such date that (i) all shares of our Series B convertible stock become eligible for resale under Rule 144 without volume restrictions or (ii) a registration statement registering the sale of such shares become effective, unless we obtain the prior written consent of the majority holders, we may not issue or sell any securities in a capital raising transaction, unless such securities are not and will not be registered under the Securities Act until on or after the effective date of a registration statement registering the sale of the Series B convertible stock. The majority holder of our Series B convertible preferred stock, has previously withheld consent to certain capital raises that were proposed by our management and approved by our Board, most recently in September 2021. As a result, we were unable to proceed with the proposed offerings and raise capital at the times, at the prices, and in the amounts, that our management and our Board deemed most beneficial to the Company. There can be no assurances that the majority holder of our Series B convertible preferred stock, will not withhold its 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.

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

As of March 1, 2022, Stillwater Holdings LLC (f/k/a Stillwater LLC) beneficially owned or controlled shares representing approximately 15% of our outstanding voting stock including ownership in Series B preferred shares that vote on an if converted basis. Flat Creek Fiduciary Management, as trustee for, a trust which the sole member of Stillwater Holdings LLC has investment control, owned approximately 3% of our outstanding voting stock, Flat Creek Fiduciary Management LLC, as trustee for a trust for the benefit of the sole member of Stillwater Holdings LLC and the descendants of such member, which owned approximately 3% of our outstanding voting stock. Together such stockholders owned approximately 21% 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 March 1, 2022, they would collectively own or control shares representing approximately 24% 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. Since January 2022, the holders of the Series B preferred shares have not sold shares of our outstanding common stock. Future sales of common stock by the holders of the Series B preferred shares or any other large shareholder may negatively impact the price or 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, internal and disclosure controls 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 applicable 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. As part of the review of our compliance program, we continually review and analyze our internal control over financial reporting for Sarbanes-Oxley Section 404 compliance. As part of that process we have and in the future may discover material weaknesses or significant deficiencies in our internal control as defined under standards adopted by the Public Company Accounting Oversight Board that require remediation. For example, in connection with our 2020 year end audit, we identified a significant deficiency in our internal controls over financial reporting related to our failure to reflect an increase in potentially dilutive common stock equivalents that could be issued as a result of sales of our common stock under our at-the-market sales agreement priced below our Series B preferred stock conversion rate. This correction had no impact on any financial statement amounts or earnings per share. Any failure to maintain effective controls or timely effect any necessary improvement of our internal and disclosure controls could harm operating results or cause us to fail to meet our reporting obligations, which could affect our ability to remain listed with NYSE American. Ineffective internal and disclosure controls could also cause investors to lose confidence in our reported financial information, which would likely have a negative effect on the trading price of our securities.

Risks Related To Our Indebtedness

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 may 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 business strategy, prevent us from entering into transactions that would otherwise benefit our business and/or negatively affect our financial condition and results of operations.

Our ABL Facility matures on December 31, 2022 and there can be no assurance that we will be able to extend or renew the facility.

Our ABL Facility expires on December 31, 2022. 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 2022 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 \$2.0 million net outstanding borrowings under the ABL Facility as of December 31, 2021.

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.

Third parties may assert claims against us which could harm our business.

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 Governmental, Legal or Regulatory Matters

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

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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, including our 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 satisfy all of the conditions of the total of \$39.1 million in U.S. governmental awards we were awarded during 2020 for purchases of capital equipment over a three-year period. The receipt of the significant amount of U.S. government awards during 2020 may impact the U.S. government's decisions regarding future awards for capital equipment contracts for R&D development work we may apply for. 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 been awarded a total of \$39.1 million in awards 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. Despite our position as the only U.S. commercial manufacturer of OLED microdisplays, there is a risk that future funding decisions, including awards of contracts for R&D development work may be influenced by political or other considerations that encompass the significant amount of awards we received during 2020. 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 the receipt of the \$39.1 million in awards we received during 2020. Some of these conditions include, improvements in yield, throughput and profitability, sourcing and installation of related equipment, and quarterly and annual reporting of progress and compliance with program terms. In addition, not all of the terms and conditions associated with such funds have been finalized, 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 also a risk that the actual price of equipment purchased may exceed the amounts budgeted under the awards, which would require use of our resources. The U.S. government will retain title to approximately 80% of the equipment purchased under this multi-year program, until a determination of performance is made at the end of the program. The award agreements contain an obligation to prioritize U.S. Department of Defense related orders, as well as penalties if we do not continue to produce OLED microdisplays for five years past the end of the program. Should the U.S. government retain title to our equipment at the end of the program, this could cause a disruption or limitation in our ability to operate. In addition, conditions imposed by these government awards could limit our flexibility, or the desire of potential partners to engage in business combinations.

There is no assurance that any future 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.

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. Certain of our products are controlled as defense articles and subject to license requirements from the DDTC for export. 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.

Continued trade tensions among the United States, China, and Russia have led to increased tariffs, trade restrictions and buy American initiatives, and have affected customer ordering patterns. The United States has imposed restrictions on the export of U.S.-regulated products and technology to our international customers, including those located in China, Russia, and certain regions of Ukraine. As a result of these ongoing tensions, we believe there is a risk that U.S. laws and regulations governing the export of goods and technology, including the EAR and ITAR, may be revised to impose even tighter restrictions, which could negatively impact our ability to successfully market and sell our non-military products to customers located in China, Russia, and certain regions of the Ukraine. Existing and future restrictions could also potentially interfere with our ability to pursue manufacturing in China and our efforts to partner with consumer companies who might seek to build displays using our technology at high volume manufacturing facilities located in China.

Our business is subject to environmental regulation and possible liability.

Our operations are subject to various federal, state and local regulations related to toxic, volatile, experimental, and other hazardous chemicals used in our design and manufacturing process. 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, and our business, results of operations and financial condition could be adversely affected.

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. Although we have cyber insurance coverage, 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.

General Risks

Our success depends in large part on attracting and retaining highly skilled and qualified management, 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. 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.

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.

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

Economic conditions, market and political instability, changes in trade agreements and conflicts, such as the conflict between Russia and Ukraine, could adversely affect global markets and transactions and may adversely 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 from the effects of adverse economic conditions or market and political instability on credit and financial markets is 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 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, 39% and 44% of our sales were to OEMs outside the United States in 2021 and 2020, respectively. These sales expose us to currency and political risk. For example, the U.S. government has imposed sanctions through several executive orders restricting U.S. companies from conducting business with specified Russian and Ukrainian individuals and companies. As a result of the uncertainty regarding these executive orders we have stopped shipments to Russia and placed all orders on hold. 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 reported financial results may be adversely affected by changes in accounting principles generally accepted in the United States.

GAAP are subject to interpretation by the Financial Accounting Standards Board, or FASB, the United States Securities and Exchange Commission, or the SEC, and various bodies formed to promulgate and interpret appropriate accounting principles. A change in these principles or interpretations could have a significant effect on our reported financial results for periods prior and subsequent to such change. The adoption of new standards may require enhancements or changes in our systems and will continue to require significant time and effort of our financial management team. We cannot predict the impact of all of the future changes to accounting principles or our accounting policies on our consolidated financial statements going forward, which could have a significant effect on our reported financial results and could affect the reporting of transactions completed before the announcement of the change. In addition, if we were to change our critical accounting estimates, including those related to inventory, contract revenue and other revenue sources, our

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operating results could be significantly affected.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our manufacturing facility and corporate headquarters are located in Hopewell Junction, NY, where we lease approximately 63,000 square feet. The NY facility houses our equipment for OLED microdisplay fabrication, assembly operations, research and development, and product development functions. In November 2020, we entered into a new ten-year lease expanding our footprint from approximately 50,000 to 63,000 square feet, including an additional 8,000 square foot of space to be used as a class 10 clean room and additional storage space. The lease expires in 2031. Additionally, we have two five-year options to extend the lease as part of this agreement. In October 2021, the Company signed an additional two-year extension of the lease of approximately 2,000 square feet of office space for design and product development in Santa Clara, CA.

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 included elsewhere in this report 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 our consumer night vision business. We have responded to the demand letter, and requested that Suga provide substantiation of purchased inventory. On August 1, 2019 we were notified by Suga that they intend to pursue arbitration. During September and October 2019, we held preliminary discussions with Suga to attempt to reach a settlement, however in November 2019 we received a formal request for arbitration which Suga filed with the International Chamber of Commerce or ICC. We 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. An arbitrator was appointed and arbitral proceedings for the consideration of the claims and counterclaims began during 2021. The parties were permitted to settle at any point during the arbitration proceedings and the parties reached a tentative settlement in April 2021. On May 12, 2021 the parties executed settlement agreements and mutual releases from all claims in exchange for a payment of \$0.6 million to Suga from the Company.

As disclosed in the financial statements in our Annual Report on Form 10-K for the year ended December 31, 2018, the Company 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. As a result of the May 12, 2021 settlement of the arbitration with Suga, the Company removed the \$1.0 million accrual from its balance sheet, wrote off \$0.3 million in prepayments and recorded a gain of \$0.1 million in Other Income/Expense during the second quarter of 2021.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

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

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

As of December 31, 2021, there were 131 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 2021 and 2020. Our 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, 2021.

ITEM 6. [RESERVED]

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Introduction

The following discussion should be read in conjunction with our financial statements and notes thereto. Our fiscal year ends December 31. This Report 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" of this Report. 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 which enable the visualization of digital information and imagery.

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 microdisplays 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.

We have been deemed to be an essential business in the State of New York and have continued to produce and ship products during the COVID-19 pandemic. We have implemented employee health and safety measures per Centers for Disease Control and Prevention, or CDC, guidelines, and monitor, federal, state and local governmental regulations to respond to the latest health and safety guidelines. As of the date of this Report, we have experienced disruptions in supply, had several employees test positive for the COVID-19 virus and had to close our facilities for cleaning purposes. There is no assurance that our operations will not be disrupted in the future by additional impacts of the COVID-19 pandemic, the Omicron variant, or other resurgences of the virus, on either our internal operations or those of our suppliers or customers, including the possible impact of disruptions in the supply of silicon wafers or other raw materials that could harm our ability to meet demand for our products in a timely manner, or within budget. In addition, please review the various risk factors relating to the COVID-19 pandemic discussed in Part II, Item 1A of this Report.

Operating expenses for 2021, including R&D expenses, increased approximately \$1.3 million compared to 2020. The majority of the increase was in R&D expenses due to materials and other overhead costs related to development and qualification of our higher brightness XLE and dPd displays and a decrease in costs allocated to contracts cost of goods sold, reflecting lower contract revenues in the 2021 periods.

We are continually making improvements in production processes; however the majority of our equipment is older and malfunctions in single point of failure equipment has the potential to delay our production until repairs can be made. We experienced equipment issues in 2020, and experienced some equipment issues during 2021. In addition, we have also experienced delays in the delivery of certain of the components used in the manufacture of our products, and also had delays in getting vendor support personnel, due to COVID-19 travel restrictions, resulting in occasional production disruptions. Equipment purchased during 2021, and expected to be purchased in 2022 under our government awards programs is expected to reduce our single point of failure risk and improve manufacturing yields and throughput. As part of our ongoing efforts to improve our throughput, yield, and quality practices, we are working with an industrial engineering firm to develop an operations excellence strategy and to obtain the AS9100 quality certification.

Our backlog at December 31, 2021 was \$13.8 million compared to backlog of \$10.9 million at December 31, 2020. Backlog is comprised of orders believed to be firm with scheduled delivery dates over the next twelve months and does not include contract revenues.

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We believe that our U.S.-based design and manufacturing, combined with in-house advanced backplane design, and our dPd technology give us a competitive advantage. Our direct patterning equipment is operational. We have fabricated full color displays including our 4kX4k and WUXGA displays, using our dPd tool, which was newly upgraded and installed during 2021. In July 2021, using our dPd technology we created full color WUXGA displays with a brightness of over 10,000 cd/m² and exhibited these displays to industry analysts in October 2021. We continue our development work for a tier one consumer customer and are targeting similar levels of brightness on proof-of-concept displays using our full color dPd process.

We received a validation of our products and technology during 2020 from the U.S. government. In 2020, we received two Department of Defense, or DOD, awards totaling \$39.1 million. We believe we are the only commercial U.S. manufacturer of OLED microdisplays and our displays are used in many U.S. military programs.

Consumer, commercial (in which we include the medical and industrial sectors), and military customers are increasingly turning to us because of our technological leadership in display brightness and resolution. This leadership in brightness is further demonstrated by our proprietary dPd capability. Unlike traditional OLEDs that produce colors by using a white source with filters that eliminate about 80% of the emitted light, with dPd, we make full color displays by directly depositing each of the primary color materials on respective sub-pixels, without the use of filters. In July 2021, we achieved full color brightness levels of over 10,000 cd/m² and expect to achieve a brightness level of over 28,000 cd/m² ready for mass production of full color displays by 2023. We achieved the highest monochrome brightness levels in the market years ago and are continuing our leadership with color displays. Display brightness is critical for AR/VR devices because of optics inefficiency and the need to eliminate motion artifacts. This is especially important for heads up displays used in bright, daylight environments. Our high resolution and low pixel pitch are also important to eliminate the "screen door" effect that comes with expanding lower resolution displays over wide fields of view.

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.

Results of Operations

Comparative results of operations for the years ended December 31, 2021 and 2020 (in thousands):

Revenues

	Twelve Months Ended December 31		
	2021	2020	Change
Product	\$ 24,176	\$ 25,042	\$ (866)
Contract	1,870	4,382	(2,512)
Total revenue, net	\$ 26,046	\$ 29,424	\$ (3,378)

Total revenues decreased \$3.4 million to \$26.0 million for the year ended December 31, 2021 compared to \$29.4 million for the year ended December 31, 2020, representing a 12% decrease.

Product revenues are comprised primarily of sales of displays as well as sales of other hardware. In 2021, product revenues decreased \$0.8 million to \$24.2 million for the year ended December 31, 2021 from revenues of \$25.0 million for the year ended December 31, 2020, representing a 3% decrease. The decrease in product revenues in 2021 was primarily due to unexpected down time of our manufacturing equipment and resulting capacity constraint resulting in \$1.1 million in late orders that did not ship in 2021.

Contract revenues primarily reflected development associated with proof of concept display for a tier-one consumer customer. In 2021, contract revenues decreased \$2.5 million to \$1.9 million for the year ended December 31, 2021 from revenues of \$4.4 million for the year ended December 31, 2020, representing a 57% decrease. Contract revenues of \$1.9 million in 2021 primarily reflected development work for an advanced display design and proof of concept for a consumer AR/VR device, which work is ongoing through 2022. Contract revenues are milestone based and not uniformly distributed throughout the project duration.

Cost of Revenues

	Twelve Months Ended December 31		
	2021	2020	Change
Product	\$ 20,480	\$ 21,054	\$ (574)
Contract	973	2,005	(1,032)
Total cost of revenues	\$ 21,453	\$ 23,059	\$ (1,606)

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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 \$1.6 million to \$21.5 million for the year ended December 31, 2021 from \$23.1 million for the year ended December 31, 2020.

Total cost of revenues as a percentage of revenues was 82% and 78%, respectively, for the years ended December 31, 2021 and 2020.

As discussed in Note 2 of the Consolidated Financial Statements included elsewhere in this report, during the first quarter of 2021 we changed our method of allocating overhead to inventory. The impact of this change for the year ended December 31, 2021 was an increase of approximately \$0.6 million in the carrying value of our work in process and finished goods inventory as of December 31, 2021, and a corresponding decrease in product cost of goods sold. This decreased our net loss by \$0.6 million and our loss per share by \$0.01 as compared to results that would have been obtained using the former method of estimation.

The decrease in product cost of goods sold for the year ended December 31, 2021 was primarily related to the decrease in product revenues compared to the prior year period.

The decrease in contract cost of goods sold for the year ended December 31, 2021, was due to the decrease in contract revenues related to the timing of activities under our development agreement with a tier-one consumer customer.

The following table outlines product, contract and total gross profit and related gross margins for the years ended December 31, 2021 and 2020 (dollars in thousands):

	Twelve Months Ended December 31	
	2021	2020
Product revenues gross profit	\$ 3,696	\$ 3,988
Product revenues gross margin	15 %	16 %
Contract revenues gross profit	\$ 897	\$ 2,377
Contract revenues gross margin	48 %	54 %
Total gross profit	\$ 4,593	\$ 6,365
Total gross margin	18 %	22 %

Total gross profit is a function of revenues less cost of revenues. In 2021, total gross profit decreased approximately \$1.8 million or 28% from gross profit of \$6.4 million in 2020. Total gross margin was 18% for the fiscal year ended December 31, 2021, down from 22% for the year ended December 31, 2020. Gross margin for 2021 was primarily impacted by decreases in contract revenues gross profit related to timing of activities under our agreement for development work with a tier-one consumer customer.

Product revenue gross profit of 15% for the year ended December 31, 2021 decreased from 16% in the prior year period due to the impact of lower product revenues in 2021.

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, 2021, contract revenue gross profit was \$0.9 million compared to \$2.4 million for the prior year period. The decrease in contract revenue gross profit for the year ended December 31, 2021 primarily reflects the decrease in contract revenues.

Operating Expenses

	Twelve Months Ended December 31		
	2021	2020	Change
Research and development expense	\$ 6,976	\$ 5,715	\$ 1,261
Percentage of net revenue	27 %	19 %	
Selling, general and administrative expense	\$ 7,579	\$ 7,567	\$ 12
Percentage of net revenue	29 %	26 %	
Total operating expenses	\$ 14,555	\$ 13,282	\$ 1,273
Percentage of net revenue	56 %	45 %	

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 technologies, microdisplay products, OLED technologies and production processes. R&D related costs associated with fulfilling contracts are categorized as contract cost of revenues. R&D expenses for the year ended December 31, 2021 were \$7.0 million as compared to \$5.7 million for the year ended December 31, 2020, an increase of \$1.3 million. The increase in R&D costs during 2021 reflects materials and other overhead costs related to development and qualification of our higher brightness XLE and dPd displays and a decrease of \$0.8 million in costs allocated to contract cost of goods sold, reflecting lower contract revenues in 2021.

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, 2021 were \$7.6 million, comparable to the year ended December 31, 2020.

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, 2021 was \$4.8 million compared to other expense of \$4.5 million for the year ended December 31, 2020.

Income related to the change in fair value of warrant liability was \$3.2 million for the year ended December 31, 2021 as compared to an expense of \$4.6 million for the year ended December 31, 2020. This non-cash income or expense in fiscal years 2021 and 2020 is associated with changes in the 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.

In addition, during 2021 we recognized other income of \$0.4 million which includes a \$0.1 million gain upon settlement of an arbitration proceeding with a contract manufacturer and \$0.3 million in reimbursement of labor overhead charges under government grant programs.

Net interest expense for the year ended December 31, 2021 was \$0.9 million as compared to net interest expense of \$0.1 million for the year ended December 31, 2020. This increase of \$0.8 million primarily relates to modifications of our facility lease agreement in December 2020 that resulted in a change in classification of related expenditures from rent expense recognized during 2020 under an operating lease to interest expense and amortization under a finance lease recognized in 2021.

Gain on forgiveness of debt

Gain on forgiveness of debt of \$2.0 million for the year ended December 31, 2021, reflects indebtedness payable to the Small Business Administration that was forgiven during the three months ended March 31, 2021, pursuant to the terms of the Paycheck Protection Program and the CARES Act.

Income Tax Expense (Benefit)

For the years ended December 31, 2021 and 2020, we had no income tax expense. We have a full valuation allowance as we recognize 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 \$5.2 million and \$11.4 million for the fiscal years ended December 31, 2021 and 2020, respectively.

Liquidity and Capital Resources

As of December 31, 2021, we had \$5.7 million of cash and cash equivalents, working capital of \$11.8 million and borrowing outstanding and borrowing availability under the ABL Facility of \$2.0 million and \$2.3 million, respectively. The \$2.6 million decrease in cash was primarily due to cash used in operating activities of \$7.4 million and investing activities of \$11.9 million, offset by cash provided by financing activities of \$15.4 million. The remaining decrease in cash was due to the decrease in restricted cash of \$1.3 million.

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On June 8, 2020, the Company received a loan under the U.S. Small Business Administration's, or SBA, Paycheck Protection Program, or PPP, from Key Bank National Association related to the COVID-19 pandemic for \$1.9 million. The terms, of the PPP loan, included a fixed interest rate of 1% per annum, a maturity date two years from the date of the funding of the loan, and deferral of payments for six months. During 2020, we used the proceeds to pay qualified payroll costs, in accordance with PPP and Section 1106 of the CARES Act requirements. We applied for forgiveness of the entire loan in the fourth quarter of 2020. In April 2021, the Company received a forgiveness notice from the SBA and received a related acknowledgement letter from its lender stating that they received payment in full from the SBA effective March 31, 2021. We recorded this amount in the Condensed Consolidated Statements of Operations as a gain on forgiveness of debt in the first quarter of 2021.

On June 11, 2020, we were granted a \$5.5 million award from IBAS. We received these funds for procurement and installation of capital equipment in our NY-based manufacturing facility. This award was created to focus on strengthening the U.S. Manufacturing and Defense Industrial Base. The release of funds to us began in August 2020 in accordance with down payments and progress payment schedules of the various capital equipment vendors.

On July 28, 2020, we received a \$33.6 million award for the purchase of capital equipment over the next 33 months from the U.S. Department of Defense to sustain and enhance U.S. domestic capability for high resolution, high brightness OLED microdisplays that will be based on the Company's proprietary dPd. This investment is in addition to the \$5.5 million award announced on June 11, 2020, under the IBAS Program for OLED Supply Chain Assurance and will be used to increase capacity and sustain operations at eMagin's Hopewell Junction, New York headquarters.

As of December 31, 2021, the Company has ordered all equipment awarded by these grants, including a production-capable dPd organic deposition tool that is expected to improve yield and throughput of this innovative technology. The Company has taken delivery of four pieces of production equipment and received \$12.5 million of the total \$39.1 million in government granted awards for initial deposits required by capital equipment vendors. Overall, the Company remains on track and within requirements of the U.S. Defense Production Act Title III and IBAS funding grants.

For the year ended December 31, 2021, cash used by operating activities were \$7.4 million, which was attributable to our net loss of \$5.2 million and changes in operating assets and liabilities of \$0.4 million and net non-cash gain of \$1.8 million. For the year ended December 31, 2020, cash used by operating activities were \$4.9 million, which was primarily attributable to our net loss of \$11.4 million and the effect of net non-cash expenses of \$7.6 million and changes in operating assets and liabilities of \$1.0 million.

For the years ended December 31, 2021 and 2020, cash used by investing activities were \$11.9 million and \$2.5 million, respectively, primarily due to equipment purchases for improving manufacturing yields and production capacity and to advance our dPd technology including grant proceeds for capital expenditures of \$10.5 million in 2021.

As of December 31, 2021, we had outstanding commitments to purchase approximately \$1.4 million in capital expenditures, and expect to make additional capital expenditures during 2022 to improve our manufacturing and R&D capabilities. These commitments exclude \$20.5 million expected to be purchased and funded by the DOD, as described above. Cash used in investing activities during the year ended December 31, 2020 was \$1.4 million for equipment purchases.

For the year ended December 31, 2021, cash provided by financing activities was \$15.4 million, including \$9.1 million in proceeds from government grants, \$6.4 million in proceeds from the exercise of warrants and employee stock options. For the year ended December 31, 2020, cash provided by financing activities were \$14.3 million of which \$9.8 million were from the net proceeds from a public offering and associated private placement of our common stock and \$1.9 million in net borrowings under our ABL Facility.

Going Concern

The consolidated financial statements included elsewhere in this report have been prepared on a going concern basis, which assumes that 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.

The Company's ABL Facility expires on December 31, 2022, and renews automatically for another year unless terminated pursuant to its terms. The ABL Facility agreement contains certain lenders remedies that give the bank the ability to impose discretionary reserves against our borrowing availability or terminate the facility upon events of default. 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 2022 and beyond at present availability levels, or at all.

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. In addition, the COVID-19 pandemic has significantly increased economic and demand uncertainty across the globe and contributed to supply chain shortages and disruptions. Although demand for

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the Company's products has remained steady, the Company's ability to obtain components and other materials or services on a timely basis has resulted in manufacturing delays, and increased costs. If these trends worsen as a result of COVID-19 or other semiconductor supply chain issues or result in lost orders it could materially and adversely affect our business, financial condition, and results of operations. 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.

We have taken actions to increase revenues and to reduce expenses and is considering financing alternatives. Our plans with regard to these matters include the following actions:

- focus production and engineering resources on improving manufacturing yields and increasing production volumes;
- continue the Work Status Reduction program that began in October 2019 wherein senior management work status was reduced by approximately 20%;
- continue to utilize government grants for purchase of capital equipment and funding manufacturing personnel;
- reduce discretionary and other expenses;
- seek to enter new markets;
- sale of common shares under our ATM equity facility; and
- consider additional financing and/or strategic alternatives.

We are reassessing our business plan and forecasts over the next two years. Based on our known cash needs as of March 2022, and the anticipated availability of its ABL facility, we have developed plans to extend our liquidity to support its working capital requirements through the first quarter of 2023.

However, there can be no assurance the Company's plans will be achieved and the Company will be able to meet its financial obligations as they become due without obtaining additional financing or sources of capital. 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.

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 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 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.

Equity Raises

On November 18, 2021, we entered into an ATM offering agreement with H.C. Wainwright & Co., LLC, or Wainwright, relating to sales of shares of our common stock under an ATM facility. On November 18, 2021 we also filed a prospectus supplement to allow the sale of shares of our common stock having an aggregate offering price of up to \$10.0 million under the ATM facility.

During 2021, we raised \$0.2 million, net of offering expenses, through the sale of shares under the ATM facility. We used and intend to use the net proceeds from sales made under the ATM facility for working capital and other general corporate purposes.

ABL Facility

On December 21, 2016, we entered into an asset based revolving credit 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 renewed on December 31, 2021 and will automatically renew on December 31, 2022 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

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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, 2021, there were \$2.0 million in net borrowings outstanding under the Financing Agreement, the interest rate was 6.5% and had unused borrowing availability of \$2.3 million. We were in compliance with all financial debt covenants as of December 31, 2021.

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, 2021 and 2020, 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.

Critical Accounting Policies and Estimates

We prepare our consolidated financial statements in accordance with accounting principles generally accepted in the United States of America ("GAAP"), which requires the use of estimates and assumptions. Refer to Note 2: Significant Accounting Policies in the Notes to Consolidated Financial Statements included elsewhere in this report for a discussion of our significant accounting policies and methods used in the preparation of our consolidated financial statements.

The following accounting estimates are viewed by management to be critical because they required significant judgment on the part of management. Management has discussed and reviewed the development, selection, and disclosure of critical accounting estimates with the Company's Audit Committee. Financial results could be materially different if other methodologies were used or if management modified its assumptions. Estimates are based on information available through the date of the issuance of the financial statements and, accordingly, actual results in future periods could differ from these estimates.

Contract 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. Refer to Note 2 in the Notes to Consolidated Financial Statements included elsewhere in this report for the Company's discussion of product revenues.

The Company recognizes contract revenue over time as we provide services to satisfy our performance obligations. We generally use the cost-to-cost percentage-of-completion measure of progress as it best depicts how control transfers to our customers. The cost-to-cost approach measures progress towards completion based on the ratio of contract cost incurred to date compared to total estimated contract cost. Use of the cost-to-cost measure of progress requires us to prepare estimates of total expected revenue and cost to complete our projects.

Due to the nature of our industry, there is significant complexity in our estimation of total expected revenue and cost, for which we must make significant judgments. Our contracts with our customers typically contain date and performance milestones and deliverables, and due to the innovative nature of the R&D processes involved, estimate of labor, materials and contract costs are difficult to predict with certainty, and are subject to change as the related projects progress.

At a project level, we have specific practices and procedures to review our estimates of total revenue and cost. Each project team reviews the progress and execution of our performance obligations, which impact the project's accounting outcome. As part of this process, the project team reviews information such as any outstanding key contract matters, progress towards completion and the related program schedule and identified risks and opportunities. The accuracy of our revenue and profit recognition in a given period depends on the accuracy of our project estimates, which can change from period to period due to a variety of factors including:

- Complexity in original design;
- Extent of changes from original design;
- Different site conditions than assumed in our bid;
- The productivity, availability and skill level of labor;
- Length of time to complete the project;
- Availability and cost of equipment and materials; and
- Our ability to recover for additional contract costs.

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We recognize changes in contract estimates on a cumulative catch-up basis in the period in which the changes are identified. Such changes in contract estimates can result in the recognition of revenue in a current period for performance obligations which were satisfied or partially satisfied in prior periods. Changes in contract estimates may also result in the reversal of previously recognized revenue if the current estimate adversely differs from the previous estimate. If we estimate that a project will have costs in excess of revenue, we recognize the total loss in the period it is identified.

Refer to Note 2 and Note 6 in the Notes to the Consolidated Financial Statements included elsewhere in this report for further information on our contract revenues and cost recognition.

Inventory Valuation

Inventories are stated at the lower of cost, determined by the first-in, first-out methodology, or net realizable value. We use a standard cost methodology to determine the cost basis for our inventories. Cost includes materials, labor, and manufacturing overhead related to the production of OLED displays. The standard cost for our products is 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. Under the principles of full absorption costing, these costs are allocated to each unit of production in work in process and finished goods inventory based on actual use of production facilities. In applying this principle, the requirements of Accounting Standards Codification, or ASC 330-10-30-4, "Inventory" require that a company determine the range of normal capacity, or production expected to be achieved over a number of periods or seasons, and limits the amount of fixed production overheads allocated to inventory in periods of abnormally low production. Financial results could be materially different if other methodologies were used or if management modified its assumptions.

During the first quarter of 2021, we redefined the Company's range of normal capacity, in recognition of a shift in product demand toward larger, more complex displays yielding fewer die per wafer. We concluded that measuring output by the number of displays produced per quarter was no longer an accurate measure of productive capacity. Management determined that measuring output based on the number of wafers produced per quarter was a more appropriate measure of production volume. Refer to Note 2 in the Notes to the Consolidated Financial Statements included elsewhere in this report for further information, as well as additional detail on the change in estimate during 2021.

Effect of Recently Issued Accounting Pronouncements

See Note 2 of the Consolidated Financial Statements included elsewhere in this report 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

Not applicable.

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ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

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Report of Independent Registered Public Accounting Firm

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 (the Company) as of December 31, 2021 and 2020, the related consolidated statements of operations, 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, 2021 and 2020, 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 obtain additional capital or 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.

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.

Critical Audit Matters

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

Contract Revenue and Cost Recognition

As described in Notes 2 and 3 to the consolidated financial statements, the Company's contract revenue was \$1,870 for the year ending December 31, 2021. The Company recognizes its contract revenues under the over time method from certain research and development activities 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 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. Any changes in estimate related to contract accounting are accounted for prospectively over the remaining life of the contract. Management exercises significant judgment in determining revenue recognition for these customer agreements as the estimate of the contract costs is critical to the recognition of revenue based under the input method.

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We identified the Company's revenue recognition of contract revenue and cost recognition as a critical audit matter because of the significant assumptions and judgements used by management in determining the estimated costs to be incurred throughout the customer contract. Auditing management's estimation of cost recognition required significant audit effort and a high degree of auditor judgment and subjectivity to evaluate the audit evidence obtained.

Our audit procedures related to the Company's contract revenue and cost recognition for these customer agreements included the following, among others:

Evaluated the Company's significant accounting policies related to contract revenue and cost recognition in accordance with the applicable accounting standards.

Evaluated the reasonableness of management estimates of cost recognition by comparing costs incurred under completed contracts to the costs estimated by management at the inception of the customer agreement.

Selected a sample of customer agreements and performed the following procedures:

- o Reviewed the terms in the customer agreement and evaluated the appropriateness of management's application of their accounting policies, along with their use of estimates, to determine the revenue recognition conclusions are reasonable.
- o Evaluated management's estimated cost budget for each selection compared to costs incurred to test amount to be recognized in accordance with management's accounting policies.

Inventory Valuation

As described in Notes 2 and 6 to the consolidated financial statements, the Company's consolidated net inventories balance was \$7,632 as of December 31, 2021. The Company's 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 valuation of inventory requires management to perform complex manual calculations using significant assumptions, including estimates related to manufacturing yields and absorption rates.

We identified inventory valuation as a critical audit matter because of certain significant assumptions, judgements and manual calculations used by management in calculation of standard cost basis. Auditing management's assumptions was complex and required a high degree of auditor judgement and subjectivity when performing audit procedures and evaluating the audit evidence obtained.

Our audit procedures related to the Company's inventory valuation included the following, among others:

Evaluated the Company's significant accounting policies related to inventory valuation in accordance with the applicable accounting standards

Evaluated the reasonableness of the significant assumptions used by management including those related to manufacturing yields and absorption rates.

Tested the completeness, accuracy, and relevance of the underlying data used in management's estimate of standard cost basis.

Tested the calculations and application of management's methodologies related to the reasonableness of the standard cost basis valuation.

/s/ RSM US LLP

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

Stamford, Connecticut
March 10, 2022

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

	December 31, 2021	December 31, 2020
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 5,724	\$ 8,315
Restricted cash	806	2,111
Accounts receivable, net	4,488	5,314
Account receivable-due from government awards	292	1,013
Unbilled accounts receivable	1,102	253
Inventories	7,632	8,379
Prepaid expenses and other current assets	691	943
Total current assets	20,735	26,328
Property, plant and equipment, net	30,483	21,132
Operating lease right - of - use assets	113	50
Intangibles and other assets	37	126
Total assets	\$ 51,368	\$ 47,636
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 1,348	\$ 1,206
Accrued compensation	1,664	1,628
Paycheck Protection Program loan - current	—	982
Revolving credit facility, net	1,974	1,875
Common stock warrant liability	1,374	4,622
Other accrued expenses	722	1,693
Deferred revenue	54	425
Operating lease liability - current	60	51
Finance lease liability - current	1,133	1,027
Other current liabilities	608	757
Total current liabilities	8,937	14,266
Other liability - long term	28	56
Paycheck Protection Program loan - long term	—	982
Deferred Income - government awards - long term	12,458	4,309
Operating lease liability - long term	54	—
Finance lease liability - long term	11,647	11,783
Total liabilities	33,124	31,396
Commitments and contingencies (Note 15)		
Shareholders' equity:		
Preferred stock, \$0.001 par value: authorized 10,000,000 shares:		
Series B Convertible Preferred stock, (liquidation preference of \$5,659) stated value \$1,000 per share, \$0.001 par value: 10,000 shares designated and 5,659 issued and outstanding as of December 31, 2021 and December 31, 2020.	—	—
Common stock, \$0.001 par value: authorized 200,000,000 shares, issued 72,931,490 shares, outstanding 72,769,424 shares as of December 31, 2021 and issued 68,890,819 shares, outstanding 68,728,753 shares as of December 31, 2020.	72	69
Additional paid-in capital	275,936	268,729
Accumulated deficit	(257,264)	(252,058)
Treasury stock, 162,066 shares as of December 31, 2021 and December 31, 2020.	(500)	(500)
Total shareholders' equity	18,244	16,240
Total liabilities and shareholders' equity	\$ 51,368	\$ 47,636

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	
	2021	2020
Revenues:		
Product	\$ 24,176	\$ 25,042
Contract	1,870	4,382
Total revenues, net	26,046	29,424
Cost of revenues:		
Product	20,480	21,054
Contract	973	2,005
Total cost of revenues	21,453	23,059
Gross profit	4,593	6,365
Operating expenses:		
Research and development	6,976	5,715
Selling, general and administrative	7,579	7,567
Total operating expenses	14,555	13,282
Loss from operations	(9,962)	(6,917)
Other (expense) income:		
Change in fair value of common stock warrant liability	3,248	(4,599)
Interest expense, net	(851)	(132)
Gain on forgiveness of debt	1,963	—
Other income, net	396	200
Total other income (expense)	4,756	(4,531)
Loss before provision for income taxes	(5,206)	(11,448)
Income taxes	—	—
Net loss	\$ (5,206)	\$ (11,448)
Less net income allocated to participating securities	—	—
Net loss allocated to common shares	\$ (5,206)	\$ (11,448)
Loss per share, basic	\$ (0.07)	\$ (0.19)
Loss per share, diluted	\$ (0.12)	\$ (0.19)
Weighted average number of shares outstanding:		
Basic	71,899,057	60,457,652
Diluted	73,179,438	60,457,652

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, 2019	5,659	\$ —	50,250,378	\$ 50	\$ 258,767	\$ (240,610)	\$ (500)	\$ 17,707
Exercise of common stock warrants	—	—	5,364,997	5	35	—	—	40
Public offering of common shares, net of offering costs	—	—	13,275,444	14	9,769	—	—	9,783
Stock based compensation	—	—	—	—	158	—	—	158
Net loss	—	—	—	—	—	(11,448)	—	(11,448)
Balance, December 31, 2020	5,659	\$ —	68,890,819	\$ 69	\$ 268,729	\$ (252,058)	\$ (500)	\$ 16,240
Exercise of common stock warrants	—	—	3,343,660	3	5,649	—	—	5,652
Exercise of options	—	—	446,551	—	725	—	—	725
Vesting of RSUs	—	—	16,667	—	—	—	—	—
Public offering of common shares, net of offering costs	—	—	233,793	—	183	—	—	183
Stock based compensation	—	—	—	—	650	—	—	650
Net loss	—	—	—	—	—	(5,206)	—	(5,206)
Balance, December 31, 2021	5,659	\$ —	72,931,490	\$ 72	\$ 275,936	\$ (257,264)	\$ (500)	\$ 18,244

See notes to Consolidated Financial Statements.

eMAGIN CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)

	Twelve Months Ended December 31	
	2021	2020
Cash flows from operating activities:		
Net loss	\$ (5,206)	\$ (11,448)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	2,815	2,112
Change in fair value of common stock warrant liability	(3,248)	4,599
Loss on sale of equipment	—	19
Gain on forgiveness of debt	(1,963)	—
Stock-based compensation	650	158
Amortization of operating lease right-of-use assets	(63)	698
Changes in operating assets and liabilities:		
Accounts receivable	1,547	(1,348)
Unbilled accounts receivable	(849)	(98)
Inventories	747	453
Prepaid expenses and other current assets	128	187
Deferred revenues	(371)	148
Operating lease liabilities	187	(730)
Accounts payable, accrued expenses, and other current liabilities	(1,805)	353
Net cash used in operating activities	(7,431)	(4,897)
Cash flows from investing activities:		
Purchase of equipment	(1,420)	(1,089)
Purchase of equipment, government grant	(10,475)	(1,411)
Proceeds from sale of equipment	—	50
Net cash used in investing activities	(11,895)	(2,450)
Cash flows from financing activities:		
Borrowings (repayments) under revolving line of credit, net	99	(1,016)
Proceeds from public offering, net	183	9,783
Proceeds from Paycheck Protection Program loan	—	1,963
Change in finance lease liabilities	(293)	(17)
Proceeds from government grant	9,064	3,505
Proceeds from warrant exercise	5,652	40
Proceeds from exercise of stock options	725	—
Net cash provided by financing activities	15,430	14,258
Net (decrease) increase in cash, cash equivalents, and restricted cash	(3,896)	6,911
Cash, cash equivalents, and restricted cash, beginning of period	10,426	3,515
Cash, cash equivalents, and restricted cash, end of period	\$ 6,530	\$ 10,426
Cash, cash equivalents, end of period	5,724	8,315
Restricted cash, end of period	806	2,111
Supplementary Cash Flow Information		
Cash paid for interest	\$ 851	\$ 52
Cash paid for income taxes	\$ —	\$ —
Non-cash activities:		
Right-of-use assets obtained in exchange for finance lease liabilities	\$ 263	\$ 12,706

See notes to Consolidated Financial Statements.

eMAGIN CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1 – Nature of Business

eMagin Corporation (the “Company”) designs, develops, manufactures and markets Active Matrix OLED (organic light emitting diode)–on-silicon microdisplays used in military and commercial AR/VR devices and other near-eye 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 (“GAAP”), 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, allowance for doubtful accounts, warranty reserves, inventory reserves, stock-based compensation expense, deferred tax asset valuation allowances, litigation and other loss contingencies, fair value of common stock warrant liability, and percentage-of-completion revenue recognition method among others. 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. The Company’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 freight on board (“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 generally 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.

[Table of Contents](#)**Costs to Obtain and Fulfill a Contract**

The incidental costs related to obtaining product sales contracts are non-recoverable from customer and, accordingly, are expensed as incurred. The Company capitalizes costs incurred to fulfill its R&D contracts that i) relate directly to a contract or anticipated contract ii) are expected to satisfy the Company's performance obligation under the contract and iii) are expected to be recovered through revenue generated under the contract. Contract fulfillment costs are expensed to cost of revenue as the related performance obligations are satisfied.

Government Funding

The Company accounts for awards received from the U.S. government for procurement of capital equipment after analysis of the terms of the underlying award contract, and in accordance with contract and equipment purchase milestones and accounting principles for grant accounting. For awards in which the Company will hold title to the underlying equipment, the Company initially records amounts invoiced to the U.S. government for equipment progress payments on the accompanying Consolidated Balance Sheets as deferred income – government awards – long term and accounts receivable- due from government awards. The Company records said progress payments made to capital equipment vendors in Property, plant and equipment. Amounts recorded in deferred income – government awards – long term will be recognized as other income on the accompanying Consolidated Statement of Operations on a systematic basis as depreciation and other expenses are incurred over the useful life of the capital equipment.

See Note 4 of the Notes of the Consolidated Financial Statements for additional details of our government funding.

Product Warranty

The Company generally 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, 2021 and 2020 (in thousands):

	Twelve Months Ended	
	December 31	
	2021	2020
Beginning balance	\$ 615	\$ 300
Warranty accruals and adjustments	(82)	333
Warranty claims	(14)	(18)
Ending balance	\$ 519	\$ 615

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.

Restricted Cash

The Company accounts for cash received pursuant to U.S. government funding, that is legally restricted for procurement of capital equipment, as Restricted Cash on the accompanying Consolidated Balance Sheets. Restricted Cash amounts are received from the U.S. government in advance of progress payments required for various program related capital equipment purchases and are disbursed by the Company to related equipment vendors.

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

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payable in U.S. dollars, are due within 30-60 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.

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.

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 cost based input method is applied and such revenue exceeds the amount invoiced to the customer. Unbilled receivables are disclosed on the Consolidated Balance Sheet.

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.

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 production of OLED displays. The standard cost for our products is 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. Under the principles of full absorption costing, these costs are allocated to each unit of production in work in process and finished goods inventory based on actual use of production facilities. However, in applying this principle, the requirements of Accounting Standards Codification, or ASC 330-10-30-4, "Inventory" require that a company determine the range of normal capacity, or production expected to be achieved over a number of periods or seasons, and limits the amount of fixed production overheads allocated to inventory in periods of abnormally low production.

Beginning in 2014, we defined normal capacity in terms of the number of displays produced per quarter. The amount of displays produced in any given period, is determined in part by the relative sizes of displays produced, and the resultant number of die that can be drawn on the surface of the silicon wafers used in our manufacturing process. Before production yield considerations, the maximum potential die per wafer amounts range from 42 for our larger newer displays through 177 for our more established displays. In 2015 and in periods subsequent, we produced fewer displays than a baseline level established during 2014, and accordingly limited the amount of fixed overhead allocated to inventory.

During the first quarter of 2021, in recognition of a shift in product demand toward larger, more complex displays yielding fewer die per wafer, we concluded that measuring output by the number of displays produced per quarter was no longer an accurate measure of productive capacity. Management determined that measuring output based on the number of wafers produced per quarter was a more appropriate measure of production volume. We reviewed the number of wafers produced through the twelve months ended December 31, 2021, and the prior two calendar years, and determined the twelve months ended December 31, 2021 level was within the range of normal capacity. We believe that fully allocating the overhead to work in process and finished goods inventories, results in more accurate inventory valuation and computation of costs of goods sold, in addition to providing better information to management in making pricing decisions.

Under this change in estimate for allocating overhead adopted in the first quarter of 2021, overhead is fully allocated to products, resulting in an increase in standard costs and inventory values. The impact of this change for the year ended December 31, 2021 was an increase of approximately \$0.6 million in the carrying value of our work in process and finished goods inventory as of December 31, 2021, and a corresponding decrease in product cost of goods sold. This decreased our net loss by \$0.6 million and our loss per share by \$0.01 as compared to results that would have been obtained using the former method of estimation.

Property, Plant and Equipment

Property, plant and equipment are stated at cost, net of accumulated depreciation and amortization. Depreciation on equipment is

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calculated using the straight-line method of depreciation over the estimated useful life ranging from three to ten 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. No impairment loss was recognized on the Company's long-lived assets during the year ended December 31, 2021.

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 \$8 thousand and \$9 thousand for the years ended December 31, 2021 and 2020, respectively.

Leases

The Company accounts for leases in accordance with ASC Topic 842: Leases, which we adopted on January 1, 2019. As a lessee, the Company records a right-of-use asset and a lease liability on the Consolidated Balance Sheet for all leases with terms longer than 12 months. Leases are classified as either finance or operating, with classification affecting the pattern of expense recognition in the Consolidated Statement of Operations.

Right-of-use assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. Lease right-of-use assets and liabilities are recognized at commencement date based on the present value of lease payments over the lease term. As most of our leases do not provide an implicit rate, the Company uses its incremental borrowing rate based on the information available at commencement date in determining the present value of lease payments, and use the implicit rate when readily determinable. The Company estimates its incremental borrowing rate based on a yield curve analysis, utilizing the interest rate derived from the fair value analysis of our credit facility and adjusting it for factors that appropriately reflect the profile of secured borrowing over the expected term of the lease. Some of our leases include the option to extend or terminate the lease. The Company includes these options in the recognition of its right-of-use assets and lease liabilities when it is reasonably certain that the Company will exercise the option. Lease expense is generally recognized on a straight-line basis over the lease term.

The Company enters into lease agreements for the use of office space, manufacturing facilities, and phone equipment, under both operating and finance leases. Operating leases are included in Operating lease right-of-use assets, and Operating lease liability – current and Operating lease liability – long term in our Consolidated Balance Sheet. Finance leases are included in Property, plant and equipment, net, Finance lease liability – current and Finance lease liability – long term in our Consolidated Balance Sheet.

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, 2021 and 2020.

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.

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Earnings per Common Share

Basic earnings 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, restricted stock units and convertible preferred stock. Diluted earnings 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.

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 earnings per share. Diluted earnings per share must be calculated under both the treasury stock and two class method, and the calculation that results in the most dilutive earnings per share amount for the common stock is reported. 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. In accordance with the Preferred Stock – Series B agreements, the conversion price was adjusted to \$0.3022 per share in December 2019, and the resultant, if converted common shares are reflected in the table of anti-dilutive common stock equivalents below.

The following table sets forth the computation of basic and diluted earnings per share (in thousands, except per share and share data) for the years ended December 31, 2021 and 2020:

	Twelve Months Ended December 31	
	2021	2020
Net income (loss)	\$ (5,206)	\$ (11,448)
Income allocated to participating securities	—	—
Income (loss) allocated to common shares	\$ (5,206)	\$ (11,448)
Change in fair value of warrant liability	\$ (3,248)	\$ —
Income (loss) allocated to common shares - Diluted	\$ (8,454)	\$ (11,448)
Weighted average common shares outstanding - Basic	71,899,057	60,457,652
Dilutive effect of liability classified warrants	1,280,381	—
Weighted average common shares outstanding - Diluted ⁽¹⁾⁽²⁾	73,179,438	60,457,652

Net income (loss) per share:		
Basic	\$ (0.07)	\$ (0.19)
Diluted	\$ (0.12)	\$ (0.19)

- (1) For the year ended December 31, 2021, weighted average shares used for calculating diluted earnings per share includes the effect of liability classified warrants as they have a dilutive effect on earnings per share.
- (2) For the year ended December 31, 2020, weighted average shares used for calculating basic and diluted earnings per share are the same as the inclusion of liability classified warrants, would be anti-dilutive to the earnings per share calculation.

The following table sets forth the potentially dilutive common stock equivalents for the years ended December 31, 2021 and 2020 that were not included in diluted EPS as their effect would be anti-dilutive:

	Twelve Months Ended December 31	
	2021	2020
Restricted Stock Units	405,453	—
Options	3,712,868	4,797,834
Warrants	4,780,447	13,055,773
Convertible preferred stock	18,726,009	18,726,009
Total potentially dilutive common stock equivalents	27,624,777	36,579,616

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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, 2021 and 2020. 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 (the "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. The payroll protection plan, or PPP loan is presented on the balance sheet, at cost which equals fair market value due to the short term nature of the loan.

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 asset 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, 2021, 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, 2021	\$ 4,622
Fair value of warrants issuance during period	-
Change in fair value of warrant liability, net	(3,248)
Balance as of December 31, 2021	\$ 1,374

The fair value of the liability for common stock purchase warrants at December 31, 2021 was 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. Inputs to the model at December 31, 2021 included remaining contractual terms of the warrants ranging from 0.42 to 1.08 years, risk-free interest rates ranging from 0.95% to 1.23%, with no expected dividends, and expected volatility of the price of the underlying common stock ranging from 57.76% to 103.71%.

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

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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 the Company'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. The Company 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 are 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. The Company is experiencing price increases and changes in allocation from one of these vendors and is working to establish additional sources of supply.

For the year ended December 31, 2021, one customer of 28.7% accounted for over 10% of net revenues. As of December 31, 2021, the Company had accounts receivable balances from the one customer of 50.3%. For year ended December 31, 2020, there were three customers of 16.9%, 12.8% and 10.9% who accounted for over 10% of net revenues. Accounts receivable balances from those three customers were 22.0%, 17.0% and 9.5%.

Liquidity and Going Concern

The accompanying consolidated financial statements have been prepared on a going concern basis, which assumes that the Company will continue to operate as a going concern and contemplates the realization of assets and the satisfaction of liabilities and commitments in the normal course of business. For the year ended December 31, 2021, the Company incurred a net loss \$5.2 million and used cash in operating activities of \$7.4 million. As of December 31, 2021, the Company had \$5.7 million of cash, \$2.0 million of outstanding indebtedness and borrowing availability of \$2.3 million under its ABL Facility.

The Company's ABL Facility expires on December 31, 2022, and renews automatically for another year unless terminated pursuant to its terms. The ABL Facility agreement contains certain lenders remedies that give the bank the ability to impose discretionary reserves against our borrowing availability or terminate the facility upon events of default. 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 2022 and beyond at present availability levels, or at all.

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. In addition, the COVID-19 pandemic has significantly increased economic and demand uncertainty across the globe and contributed to supply chain shortages and disruptions. Although demand for the Company's products has remained steady, the Company's ability to obtain components and other materials or services on a timely basis has resulted in manufacturing delays, and increased costs. If these trends worsen as a result of COVID-19 or other semiconductor supply chain issues or result in lost orders it could materially and adversely affect our business, financial condition, and results of operations. 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 has taken actions to increase revenues and to reduce expenses and is considering financing alternatives. 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) continue a Work Status Reduction program that began in October 2019 wherein senior management work status was reduced by approximately 20%, 3) continue to utilize government grants for purchase of capital equipment and funding manufacturing personnel, 4) reduce discretionary and other expenses, 5) seek to enter new markets, 6) sell shares under its At the Market or ATM equity facility entered into in November 2021, and 7) consider additional financing and/or strategic alternatives.

The Company is reassessing its business plans and forecasts over the next two years. Based on its known cash needs as of March

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2022, and the anticipated availability of its ABL facility, the Company has developed plans to extend its liquidity to support its working capital requirements through the first quarter of 2023.

However, there can be no assurance the Company's plans will be achieved and the Company will be able to meet its financial obligations as they become due without obtaining additional financing or sources of capital. 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.

Recently Adopted Accounting Pronouncements

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 simplifies 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 adopted the guidance on January 1, 2021, on a prospective basis and such adoption did not have a material impact on the Company's financial statements.

Recently Issued and Not Yet Adopted Accounting Pronouncements

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 is currently evaluating the impact of this ASU on the consolidated financial statements.

In August 2020, the FASB issued ASU 2020-06, Debt - Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging - Contracts in Entity's Own Equity (Subtopic 815-40) Accounting for Convertible Instruments and Contracts in an Entity's Own Equity. This guidance changes how entities account for convertible instruments and contracts in an entity's own equity and simplifies the accounting for convertible instruments by removing certain separation models for convertible instruments. This guidance also modifies the guidance on diluted earnings per share calculations. This new guidance is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2023. The Company is currently evaluating the impact of this ASU on the consolidated financial statements.

In November 2021, the FASB issued ASU 2021-10, Government Assistance (Topic 832): Disclosures by Business Entities about Government Assistance. This update requires annual disclosures about transactions with a government that are accounted for by applying a grant or contribution accounting model by analogy. This standard is effective beginning after December 15, 2021. The amendments should be applied either (1) prospectively to all transactions within the scope of the amendments that are reflected in financial statements at the date of initial application and new transactions that are entered into after the date of initial application or (2) retrospectively to those transactions. The Company adopted the guidance on January 1, 2022, on a prospective basis and such adoption did not have a material impact on the Company's financial statements.

Note 3 – 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 R&D activities performed pursuant to 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.

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Additional disaggregated revenue information for the years ended December 31, 2021 and 2020 were as follows (in thousands):

	Twelve Months Ended December 31	
	2021	2020
North and South America	\$ 16,148	\$ 16,434
Europe, Middle East, and Africa	8,180	9,834
Asia Pacific	1,718	3,156
Total	\$ 26,046	\$ 29,424

	Twelve Months Ended December 31	
	2021	2020
Military	\$ 17,320	\$ 21,373
Commercial, including industrial and medical	2,775	1,607
Consumer	1,796	3,383
Multiple	4,155	3,061
Total	\$ 26,046	\$ 29,424

Accounts Receivable from Customers

Accounts receivable, net of allowances, associated with revenue from customers were approximately \$4.5 million and \$5.3 million as of December 31, 2021 and 2020, 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 cost based input method is applied and such revenue exceeds the amount invoiced to the customer. Unbilled receivables are disclosed on the Consolidated Balance Sheet.

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 2021	December 31, 2020
Unbilled Receivables (contract assets)	\$ 1,102	\$ 253
Deferred Revenue (contract liabilities)	\$ 54	\$ 425

During the years ended December 31, 2021 and 2020, the Company recognized \$0.4 million and \$0.2 million of revenue related to its contract liabilities that existed as of December 31, 2021 and 2020, 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, 2021 and 2020, the aggregate amount of the transaction price allocated to remaining performance obligations was \$0.5 million and \$2.5 million. The Company expects to recognize \$0.5 million of revenue relating to its remaining performance obligations over the next 12 months.

Note 4- Government Funding

On July 28, 2020, the Company announced that it had been awarded a \$33.6 million contract over the next 33 months from the

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Department of Defense (“DoD”) to sustain and enhance U.S. domestic capability for high resolution, high brightness OLED microdisplays that will be based on the Company’s proprietary dPd technology. This investment is in addition to the \$5.5 million award announced on June 11, 2020, under the Department of Defense Industrial Base Analysis (“IBAS”) Program for OLED Supply Chain Assurance and will be used to increase capacity and sustain operations at the Company’s Hopewell Junction, New York, headquarters. These funds will be used to procure key equipment and tooling, and reimburse the Company for certain labor and material costs, which the Company believes will improve all aspects of its OLED microdisplay production, including increased throughput and capacity.

Pursuant to the preliminary Technology Investment Agreement the government provided when the award was announced, the Company expects that the government will own the related equipment purchases until the end of the 33 month contract period, at which point the Company can apply to take title. The Company began making payments to related equipment vendors during the fourth quarter of 2020. For accounting purposes the Company considers that it is probable that title will pass to the Company and accordingly will treat this award in a similar fashion as the IBAS award.

The Company recognizes the government awards as deferred income – government awards as program milestones are invoiced, and will recognize other income as depreciation and other expenditures are incurred over the useful life of the capital equipment. As of December 31, 2021, the Company has received \$12.5 million for initial deposits required by capital equipment vendors. Amounts received, pending payment of deposits to vendors as of December 31, 2021, of \$0.8 million are reflected in restricted cash on the accompanying balance sheet. Amounts due from the U.S. Department of Defense pursuant to invoices for capital equipment are presented on the balance sheet as accounts receivable – due from government awards. The total amount invoiced during the year ended December 31, 2021 of \$12.5 million is reflected less depreciation in deferred revenue government awards – long term, and other current liabilities. Additional amounts remaining under the awards will be recorded in a similar fashion and will coincide with the progress payments required under the various capital equipment purchase terms. For the year ended December 31, 2021, the Company recognized deferred income related to certain overhead expenses, not capitalized, of \$255 thousand.

The terms of various government agreements provide among other items that the Company must achieve certain yield targets, give priority to military orders and continue to maintain the productive capacity of equipment purchased for up to five years past the completion of the programs.

Amounts billed to the government under these programs are recorded as Accounts Receivable – due from government awards on the accompanying Consolidated Balance Sheets.

Note 5 – Accounts Receivable, net

Accounts receivable consisted of the following (in thousands):

	December 31 2021	December 31, 2020
Accounts receivable	\$ 4,627	\$ 5,453
Less allowance for doubtful accounts	(139)	(139)
Accounts receivable, net	<u>\$ 4,488</u>	<u>\$ 5,314</u>

Note 6 – Inventories, net

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

	December 31 2021	December 31, 2020
Raw materials	\$ 3,517	\$ 3,995
Work in process	2,149	1,263
Finished goods	2,363	3,918
Total inventories	8,029	9,176
Less inventory reserve	(397)	(797)
Total inventories, net	<u>\$ 7,632</u>	<u>\$ 8,379</u>

[Table of Contents](#)**Note 7 – Prepaid Expenses and Other Current Assets**

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

	December 31,	
	2021	2020
Vendor prepayments	\$ 471	\$ 716
Other prepaid expenses	220	227
Total prepaid expenses and other current assets	<u>\$ 691</u>	<u>\$ 943</u>

Note 8 – Property, Plant and Equipment

Property, plant and equipment improvements consist of the following (in thousands):

	December 31,	
	2021	2020
Computer hardware and software	\$ 1,008	\$ 921
Lab and factory equipment	21,100	20,554
Furniture, fixtures and office equipment	59	59
Finance lease - equipment	116	116
Finance lease - manufacturing facility	12,968	12,706
Construction in progress	11,804	1,734
Leasehold improvements	151	128
Factory Equipment - Gov't Award	1,170	-
Total property, plant and equipment	<u>48,376</u>	<u>36,218</u>
Less: accumulated depreciation and amortization	(17,893)	(15,086)
Property, plant and equipment, net	<u>\$ 30,483</u>	<u>\$ 21,132</u>

Depreciation and amortization expense was \$2.8 million and \$2.1 million for years ended December 31, 2021 and 2020. Amortization expense was \$622 thousand and \$68 thousand for assets under finance leases for the years ended December 31, 2021 and 2020. During 2020, the Company expanded its manufacturing space and signed a 10-year renewal of the related lease agreement, with two five year options to renew. The present value of the related lease payment exceeded 90% of the fair value of the underlying asset, classifying this as a finance lease. Formerly, the lease was classified as an operating lease and right of use asset.

Note 9 – Debt / Line of Credit

(in thousands)	December 31, 2021	December 31, 2020
Revolving credit facility	\$ 1,974	\$ 1,875

On December 21, 2016, the Company 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 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, 2021, the interest rate on outstanding borrowings was 6.5%. The ABL Facility renewed on December 31, 2021 and will automatically renew on December 31, 2022 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 Consolidated Balance Sheet.

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

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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, 2021, the Company had unused borrowing availability of \$2.3 million and was in compliance with all financial debt covenants.

For the year ended 2021, interest expense includes interest paid, or accrued of approximately \$58 thousand on outstanding ABL Facility debt.

Paycheck Protection Program

On June 8, 2020, the Company received a loan under the U.S. Small Business Administration's ("SBA") Paycheck Protection Program from KeyBank National Association related to the COVID-19 crisis in the amount of \$1.9 million (the "PPP loan"). Under the PPP loan, the loan has a fixed interest rate of 1% per annum, a maturity date two years from the date of the funding of the loan, and deferral of payments for six months. During 2020, the Company used the proceeds to pay qualified payroll costs, in accordance with PPP and Section 1106 of the Coronavirus Aid, Relief, and Economic Security Act, or the CARES Act, requirements. Pursuant to the terms of the PPP loan, the Company applied for forgiveness of the entire loan in the fourth quarter of 2020. In April 2021, the Company received a forgiveness notice from the SBA and received a related acknowledgment letter from its lender stating that they received payment in full from the SBA effective March 31, 2021. The amount was recorded in the Consolidated Statements of Operations as a gain on forgiveness of debt in the first quarter of 2021.

Note 10 – Leases

The Company leases office and manufacturing facilities in Hopewell Junction, New York under a non-cancelable operating lease agreement. The lease for these facilities, as amended, was to expire in May 2024 and did not contain a renewal option. The lease agreement did not contain any residual value guarantees, or material restrictive covenants. In November 2020, we entered into the 12th amendment, which expanded the current footprint to approximately 63,000 square feet in 2021 and includes two five year options to extend. Under ASU 842, the company reassessed the lease from operating to a finance lease for the 12th amendment.

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 expired in October 2021. The lease agreement did not contain any residual value guarantees, material restrictive covenants or a renewal option. This lease was classified as an operating lease. In October 2021, the Company signed an additional two-year extension of the lease for the Santa Clara design group facility, and concluded that it remains as an operating lease. On May 2, 2019, the Company entered into a three year finance lease commitment for phone equipment.

The Company's leases generally do not provide an implicit rate, and therefore the Company uses its incremental borrowing rate as the discount rate when measuring lease liabilities. The Company estimates its incremental borrowing rate based on a yield curve analysis, utilizing the interest rate derived from the fair value analysis of the Company's credit facility and adjusting it for factors that appropriately reflect the profile of secured borrowing over the expected term of the lease.

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

	Twelve Months Ended December 31	
	2021	2020
Finance Lease Cost:		
Amortization of right-of-use assets	\$ 622	\$ 68
Interest on lease liabilities	793	70
Operating lease cost	62	965
Total Lease Cost	\$ 1,477	\$ 1,103
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from operating leases	\$ (187)	\$ 1,068
Financing cash flows from finance leases	\$ 1,088	\$ 103
Right-of-use assets obtained in exchange for new finance lease liabilities	\$ 263	\$ 12,706
Right-of-use assets obtained in exchange for new operating lease liabilities	\$ -	\$ -

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	December 31, 2021	December 31, 2020
Finance lease right-of-use assets	\$ 12,318	\$ 12,677
Operating lease right-of-use assets	\$ 113	\$ 50
Finance lease liability, current	\$ 1,133	\$ 1,027
Finance lease liability, non-current	\$ 11,647	\$ 11,783
Operating lease liabilities, current	\$ 60	\$ 51
Operating lease liabilities, non-current	\$ 54	\$ -
Weighted average remaining lease terms - finance leases	20.58 years	20.67 years
Weighted average remaining lease terms - operating leases	1.83 years	0.84 years
Weighted average discount rate - finance leases	6.42%	6.43%
Weighted average discount rate - operating leases	7.75%	7.75%

Future annual minimum lease payments and finance lease commitments as of December 31, 2021 were as follows (in thousands):

	Operating Leases	Finance Leases
2022	\$ 65	\$ 1,135
2023	55	1,229
2024	-	1,229
2025	-	1,229
2026	-	1,229
Thereafter	-	22,102
Total undiscounted future minimum lease payments	120	28,153
Less imputed interest	(6)	(15,373)
Lease liability	<u>\$ 114</u>	<u>\$ 12,780</u>

(1) Total future lease payments exclude approximately \$4.9 million of lease payments related to the Expansion Space portion of the NY Lease that was signed but has not yet commenced as of December 31, 2021.

Note 11 – Income Taxes

New Tax Legislation

On March 27, 2020, the President of the United States signed the Coronavirus Aid Relief and Economic Security Act (“CARES Act”). The CARES Act provides several provisions that effect businesses from an income tax perspective. Due to the history of the tax losses, most of the CARES Act provisions have no current benefit to the Company. The Company can, however benefit from one provision, which allows for the immediate refund of the Alternative Minimum Tax Credit (“AMT Credit”) previously recognized as deferred tax asset. The Company has filed an amendment to claim the AMT Credit and is anticipating a refund of \$212 thousand. This tax receivable was recorded during 2017, and is reflected in Prepaid Expenses and Other Current Assets on the Consolidated Balance Sheet.

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

	For the Years Ended December 31,	
	2021	2020
Domestic, current	\$ (5,206)	\$ (11,448)
Total	<u>\$ (5,206)</u>	<u>\$ (11,448)</u>

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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,	
	2021	2020
Deferred tax assets:		
Federal and State Net Operating Loss Carryforwards	\$ 22,578	\$ 28,153
Research and Development Tax Credit Carryforwards	2,237	2,450
Stock based compensation	1,665	1,561
Other provision and expenses not currently deductible	4,448	2,317
Total deferred tax assets	30,928	34,481
Deferred tax liabilities:		
Depreciation and amortization	(507)	(521)
Prepaid expenses	(7)	(68)
Total deferred liabilities	(514)	(589)
Less: valuation allowance	(30,414)	(33,892)
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, 2021, the Company's deferred tax assets were generated primarily from the federal and state net operating loss, stock based compensation, research and development tax credits and other provision and expenses not currently deductible. 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, 2021 and 2020.

As of December 31, 2021 and 2020, the Company had net deferred tax assets before its valuation allowance of \$30.4 million and \$33.9 million, respectively.

During the year ended December 31, 2021, the Company did not utilize its prior years' net operating loss carryforwards and the net operating loss of \$13.8 million and \$14.4 million that originated in 2000 and 2001, respectively, expired. As of December 31, 2021, the Company had federal and state net operating loss carryforwards of \$105.1 million and federal research and development tax credit carryforwards of \$2.2 million. Pursuant to provisions of the 2017 Tax Cut and Jobs Act, the net operating losses originating in years subsequent to 2017 totaling \$16.4 million can be carried forward indefinitely but limited to 80% of taxable income in the year of utilization.

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	\$ -	\$ -
2021-2024	14,507	-
2025-2037	74,173	2,237
No Expiration	16,397	-
	\$ 105,077	\$ 2,237

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.

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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,	
	2021	2020
U.S. Federal income tax benefit at federal statutory rate	21 %	21 %
Change in valuation allowance	67	9
Permanent differences	21	(8)
NOL Expiration - 1998	(115)	(21)
Other, net	6	(1)
Effective tax rate	- %	- %

The Company did not have unrecognized tax benefits at December 31, 2021 and 2020. The Company recognizes interest accrued and penalties related to unrecognized tax benefits in tax expense. During the years ended December 31, 2021 and 2020, 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.

The following table sets forth the Company's outstanding common stock warrants as of December 31, 2021:

	Issued	Outstanding	Exercise Price	Expiration
2016 Warrant Issuance	2,947,949	1,680,447	2.60	Feb 2022
2017 Warrant Issuance ⁽¹⁾	100,000	100,000	2.25	Mar 2022
2017 Warrant Issuance ⁽²⁾	1,650,000	1,650,000	2.45	Nov 2022
2018 Warrant Issuance ⁽²⁾	4,004,329	2,909,374	1.55	Jul 2023
2019 Warrant Issuance ⁽³⁾	6,000,000	3,000,000	0.78	Oct 2024
		<u>9,339,821</u>		

(1) Issued in conjunction with an unsecured line of credit.

(2) Warrants are subject to liability accounting.

(3) Private Placement unregistered warrants exercisable six months following issuance.

Equity classified warrants

The 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 Consolidated Balance Sheet.

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.

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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):

	<u>December 31</u> <u>2021</u>	<u>December 31,</u> <u>2020</u>
2018 January and February Issuance		
Fair Value	\$ 1,355	\$ 3,577
2017 May Issuance		
Fair Value	19	1,045
	<u>\$ 1,374</u>	<u>\$ 4,622</u>
	Twelve Months Ended December 31	
	<u>2021</u>	<u>2020</u>
Change in Fair Value of common stock warrant liability ⁽¹⁾	3,248	(4,599)

(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 was initially convertible into common stock at a conversion price of \$0.75 per share, subject to adjustment if the Company conducts an equity offering priced below that amount. Pursuant to this provision, the conversion price was reduced to \$0.3022 per share in December 2019. At the current conversion price, the Series B Preferred Stock is convertible into 18,726,009 shares of the Company common stock and votes on an as converted basis with the common stock. 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, 2021 and 2020, there were 5,659 shares of Preferred Stock – Series B issued and outstanding.

[Table of Contents](#)**Common Stock**

Common shares issued due to option and warrant exercises, vesting of restricted stock units and public offering of common shares (dollar amounts in thousands):

	Twelve Months Ended	
	December 31	
	2021	2020
Shares issued due to Options exercised	446,551	-
Proceeds	\$ 725	\$ -
Shares issued due to Warrants exercised ⁽¹⁾	3,343,660	5,364,997
Proceeds	\$ 5,652	\$ 40
Shares issued due to Restricted Stock Unit Vesting	16,667	-
Proceeds	\$ -	-
Pursuant to ATM Financing	233,793	-
Proceeds	\$ 183	-

(1) A total of 3,678,712 warrants to purchase common share were exercised, and 335,052 common shares were surrendered to the Company pursuant to cashless exercise provisions.

Equity Issuances

On June 10, 2020, the Company filed a prospectus supplement to update and amend the aggregate amount of shares it may sell pursuant to the At Market Offering Agreement, dated November 22, 2019, as amended from time to time, between the Company and H.C. Wainwright & Co., LLC. During the year ended December 31, 2020, the Company raised \$9.8 million, net of offering expenses, through the sale of shares under the ATM facility which represented the remaining amount available under the facility.

On November 18, 2021 the Company entered into an ATM offering agreement with H.C. Wainwright & Co., LLC, or Wainwright, relating to sales of shares of its common stock under a new ATM facility. On November 18, 2021 the Company also filed a prospectus supplement to allow the sale of shares of its common stock having an aggregate offering price of up to \$10.0 million under the new ATM facility. During the year ended December 31, 2021, the Company raised \$0.2 million, net of offering expenses, through the sale of shares under the new ATM facility.

Note 14 – Stock Compensation**Incentive compensation plans**

The 2019 Non-Employee Director Stock Option and Incentive Plan (the “2019 Director Plan”) adopted and approved by the shareholders on December 5, 2019 was designed to enhance the flexibility to grant equity awards to Directors and to ensure grant of equity awards to eligible recipients. The 2019 Plan has an aggregate of 2.0 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.

The 2019 Employee and Consultant Stock Option and Incentive Plan (the “2019 Employee and Consultant Plan”) 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.

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Stock Option Summary

A summary of the Company's stock option activity for the year ended December 31, 2021 is presented in the following table:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (In Years)	Aggregate Intrinsic Value
Outstanding at December 31, 2020	4,797,834	\$ 2.17		
Options granted	230,000	3.24		
Options exercised	(514,707)	1.92		
Options forfeited	—	—		
Options cancelled or expired	(800,259)	4.27		
Outstanding at December 31, 2021	3,712,868	\$ 1.81	3.31	\$ 901,111
Vested or expected to vest at December 31, 2021 ⁽¹⁾	3,711,637	\$ 1.81	3.31	\$ 901,015
Exercisable at December 31, 2021	3,586,867	\$ 1.77	3.13	\$ 892,211

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

At December 31, 2021, there were 4,459,833 shares available for grant under the 2019 Employee and Consultant Plan and 1,640,000 shares available under the 2019 Non - Employee Director Incentive Plans. 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, 2021 for the options that were in-the-money. As of December 31, 2021 there were 1,406,281 options that were in-the-money. The Company's closing stock price was \$1.29 as of December 31, 2021. The Company issues new shares of common stock upon exercise of stock options. The aggregate intrinsic value of options exercised was \$1.0 million for the year ended December 31, 2021.

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	
	2021	2020
Dividend yield	0 %	0 %
Risk free interest rates	0.89-0.95 %	0.3 %
Expected volatility	75.9 to 79.0 %	69.6 %
Expected term (in years)	5.0 to 5.5	5.5

The weighted average fair value per share for options granted in 2021 and 2020 was \$2.21 and \$0.48, respectively.

There were no dividends declared or paid in 2021 or 2020. The Company does not expect to pay dividends in the near future. Therefore, the Company used an expected dividend yield of 0%. The risk-free interest rate used in the Black-Scholes option pricing model is based on an applicable yield available at the date of the option grant 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.

[Table of Contents](#)*Restricted Stock Units ("RSU") Summary*

A summary of the Company's stock option activity for the year ended December 31, 2021 is presented in the following table:

	Number of Awards		Weighted Average Grant Date Fair Value Per Share	
	Service based	Performance based	Service based	Performance based
RSUs outstanding, beginning of period	50,000	—	\$ 0.84	\$ —
Granted	430,945	103,048	3.50	3.60
Vested and settled	(16,667)	—	0.84	—
Forfeited	(58,825)	—	1.84	—
RSUs outstanding, end of period	<u>405,453</u>	<u>103,048</u>	<u>3.52</u>	<u>3.60</u>

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 fair value of Restricted Stock Units, or RSUs, is established by the market price of the Company's common stock at the date of grant and for time based grants, is amortized over the vesting period using the straight line method. Performance-based RSUs are typically granted such that they vest upon the achievement of EBITDA targets, during a specified performance period, subject to the satisfaction of certain time-based service criteria. Compensation expense from these awards is equal to the fair market value of the Company's ordinary shares on the date of grant and is recognized over the remaining service period based on the probable outcome of achievement of the financial metrics used in the specific grant's performance criteria. Management's estimate of the number of shares expected to vest is based on the anticipated achievement of the specified non-market performance criteria, which are assessed at each reporting period.

The following table summarizes the allocation of non-cash stock-based compensation to the Company's expense categories for the years ended December 31, 2021 and 2020 (in thousands):

	Twelve Months Ended December 31	
	2021	2020
Cost of revenues	\$ 62	\$ 16
Research and development	138	42
Selling, general and administrative	450	100
Total stock compensation expense	<u>\$ 650</u>	<u>\$ 158</u>

At December 31, 2021, total unrecognized compensation costs related to stock options and RSUs was approximately \$118 thousand and \$1.1 million, net of estimated forfeitures. Total unrecognized compensation cost for stock options and RSUs will be adjusted for future changes in estimated forfeitures and is expected to be recognized over a weighted average period of approximately 0.5 years and approximately 2.4 years, respectively.

Note 15 – Commitments and Contingencies**Equipment Purchase Commitments**

The Company has committed to equipment purchases of approximately \$1.4 million at December 31, 2021.

In addition, through December 31, 2021, the Company has committed to equipment to be purchased under government awards of \$20.5 million.

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

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maximum of 3% of qualified compensation. The Company's contributions were \$0.1 million for the years ended December 31, 2021 and 2020, respectively.

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 may become subject to various legal proceedings that are incidental to the ordinary conduct of our business. In March 2019, the Company 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 our consumer night vision business. The Company has responded to the demand letter, and requested that Suga provide substantiation of purchased inventory. On August 1, 2019, the Company was notified by Suga that they intend to pursue arbitration. During September and October 2019, the Company held preliminary discussions with Suga to attempt to reach a settlement, however in November 2019 a formal request for arbitration was received, 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. An arbitrator was appointed and arbitral proceedings for the consideration of the claims and counterclaims, and settlement discussions continued through May 2021. The parties were permitted to settle at any point during the arbitration proceedings and the parties reached a tentative settlement in April 2021. On May 12, 2021 the parties executed settlement agreements and mutual releases from all claims in exchange for a payment of \$0.6 million to Suga from the Company.

As disclosed in the financial statements in our Annual Report on Form 10-K for the year ended December 31, 2018, the Company 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. As a result of the May 12, 2021 settlement of the arbitration with Suga the Company removed the \$1.0 million accrual from its balance sheet, wrote off \$0.3 million in prepayments and recorded a gain of \$0.1 million in Other Income / Expense during the second quarter of 2021.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

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. Our disclosure controls and procedures are designed to provide reasonable, not absolute, assurance that the objectives of our disclosure control system are met. Because of inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues, if any, within a company have been detected. Based on our evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that, as of the end of the period covered by this Report, our disclosure controls and procedures were effective.

(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 our 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, 2021, 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

During the quarter ended December 31, 2021, there were no changes in our internal control over financial reporting that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting, as communicated to the Audit Committee. Despite the impact of the COVID-19 pandemic, due to the Company’s classification as an essential business, our finance and administrative workforce worked onsite during the quarter ended December 31, 2021. We are continually monitoring and assessing the COVID-19 pandemic on our internal controls to minimize the impact on their design and operating effectiveness.

ITEM 9B. OTHER INFORMATION

None.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS.

Not applicable.

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 9, 2022, which will be filed with the SEC within 120 days after the end of our fiscal year ended December 31, 2021 (the "2022 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 2022 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 2022 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 2022 Proxy Statement.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this Item will be incorporated herein by reference from the section captioned "Audit Fees" in the 2022 Proxy Statement.

PART IV

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:

Consolidated Balance Sheets at December 31, 2021 and 2020.
Consolidated Statements of Operations for the Years Ended December 31, 2021 and 2020.
Consolidated Statements of Changes in Shareholders' Equity for the Years Ended December 31, 2021 and 2020.
Consolidated Statements of Cash Flows for the Years Ended December 31, 2021 and 2020.
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.

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Exhibit Number	Description
2.1	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).
3.1	Amended and Restated Certificate of Incorporation (incorporated by reference to an appendix to the Registrant's Definitive Proxy Statement filed on September 21, 2006).
3.2	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).
3.3	Bylaws of the Registrant (incorporated by reference to exhibit 99.3 to the Registrant's Definitive Proxy Statement filed on June 14, 2001).
3.4	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).
4.1	Common Stock Purchase Warrant issued on March 24, 2017, set forth as Exhibit 4.5 to the Company's quarterly report on form 10-Q filed on November 9, 2017 (incorporated by reference to exhibit 4.5 to the Company's Quarterly Report on Form 10-Q filed on November 9, 2017).
4.2	Form of Common Stock Purchase Warrant set forth as Exhibit 4.1 to the Company's Current Report on Form 8-K filed on May 24, 2017 (incorporated by reference to exhibit 4.1 to the Company's Current Report on Form 8-K filed on May 24, 2017).
4.3	Form of Common Stock Warrant Agreement and Common Stock Purchase Warrant Certificate (incorporated by reference to exhibit 4.2 to the Company's registration statement on Form S-1/A filed on January 23, 2018).
4.4	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).
4.5	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).
4.7	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).
4.8	Description of Registrant's Securities (filed herewith).
10.1	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).
10.2	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).
10.3	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).*
10.4	2013 Incentive Stock Plan, filed April 2, 2013, as filed in the Registrant's Definitive Proxy Statement incorporated herein by reference.*
10.5	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).

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<u>10.6</u>	<u>Financing Agreement, dated as of December 29, 2016, 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>10.7</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>10.8</u>	<u>2019 Employee and Consultant Stock Option and Incentive Plan filed October 23, 2019, as filed in the registrant's Definitive Proxy Statement incorporated herein by reference.*</u>
<u>10.9</u>	<u>2019 Non-Employee Director Stock Option and Incentive Plan filed October 23, 2019, as filed in the Registrant's Definitive Proxy Statement incorporated herein by reference.*</u>
<u>10.10</u>	<u>12th Lease Amendment between IPark East Fishkill and eMagin Corporation, effective as of November 20, 2020 (incorporated by reference to exhibit 10.10 to the Company's Current Report on Form 10-K filed on March 19, 2021).</u>
<u>10.11</u>	<u>At Market Offering Agreement, dated November 18, 2021, 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 19, 2021).</u>
<u>10.12</u>	<u>Form of Securities Purchase Agreement (incorporated by reference to exhibit 10.1 to the Company's Current Report on Form 8-K filed on April 8, 2019).</u>
<u>10.11</u>	<u>Prototype Project Agreement for Organic Light Emitting Diode (OLED) Micro-Displays, dated as of June 8, 2020, between the Company and the United States of America (incorporated by reference to exhibit 10.3 to the Company's Quarterly Report on Form 10-Q filed on August 13, 2020).</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>
<u>101.INS</u>	<u>Inline XBRL Instance Document (filed herewith).</u>
<u>101.SCH</u>	<u>Inline XBRL Taxonomy Extension Schema Document (filed herewith).</u>
<u>101.CAL</u>	<u>Inline XBRL Taxonomy Extension Calculation Linkbase Document (filed herewith).</u>
<u>101.DEF</u>	<u>Inline XBRL Taxonomy Extension Definition Linkbase Document (filed herewith).</u>
<u>101.LAB</u>	<u>Inline XBRL Taxonomy Extension Label Linkbase Document (filed herewith).</u>
<u>101.PRE</u>	<u>Inline XBRL Taxonomy Extension Presentation Linkbase Document (filed herewith).</u>
<u>104.</u>	<u>Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101) (filed herewith).</u>

* Each of the Exhibits noted by an asterisk is a management compensatory plan or arrangement.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized on this 10th day of March 2022.

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 10, 2022, on behalf of the registrant and in the capacities indicated.

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