Inradoptics

2022 Annual Report

Operating and Financial Summary

For the Year Ended December 31, *In thousands, except for per share amounts*		**2022**	**2021**	**2020**
Total Revenue	$	10,631	11,353	9,008
Operating Income (Loss)	$	319	939	(748)
Net Income (Loss)	$	153	1,749	(899)
Net Income (Loss) Per Share - Basic	$	0.01	0.13	(0.07)
Net Income (Loss) Per Share - Diluted	$	0.01	0.11	(0.07)
Capital Expenditures	$	539	202	201
New Order Bookings	$	18,720	17,902	9,952
Product Backlog	$	20,488	12,419	5,909
Book-to-Bill Ratio		1.76:1	1.58:1	1.10:1

At December 31, *In thousands, except for per share amounts*		**2022**	**2021**	**2020**
Working Capital	$	4,359	4,585	3,479
Total Assets	$	7,272	7,272	7,028
Current Ratio	$	3.01:1	4.56:1	2.84:1
Total Debt (Including Current Portion and Facility Lease)	$	3,625	2,818	4,099
Convertible Notes	$	2,500	2,500	2,500
Total Debt (Excluding Convertible Notes)	$	1,125	318	1,599
Shareholder's Equity	$	3,668	3,323	1,355
Shareholder's Equity (Including Convertible Notes)	$	6,168	5,823	3,855
Total Common Shares Outstanding		14,088	13,963	13,820
Debt (Including Convertible Notes) to Equity Ratio		0.99:1	0.85:1	3.03:1
Debt to Equity (Including Convertible Notes) Ratio		0.18:1	0.06:1	0.42:1
Return on Equity - %		4.16%	52.64%	(66.3%)

We improve the world's safety, security and scientific understanding by transforming challenging requirements into optical realities.

Ten years ago, I prepared my first annual letter to our shareholders, announcing the renaming of the Company, then Photonics Products Group, to Inrad Optics—an updated version of the legacy Inrad brand name. Today, as I write this communication, we are a thriving and focused organization, celebrating the 50th anniversary of the Company's founding.

Inrad Optics was established in 1973 as Interactive Radiation, by Dr. Warren Ruderman, once a young scientist on the Manhattan Project. Dr. Ruderman, both a scientist and an entrepreneur, made a defining impact in the field of crystal growth, particularly in non-linear laser materials and UV filter crystals. Although I never had the pleasure of meeting Dr. Ruderman, I know that we continue to carry his drive for exceptional quality.

Over the past 50 years, Inrad Optics has grown, morphed, and transitioned in many ways. We have persevered through global economic downturns and shifts in the optics and photonics marketplace. We have arrived at the half-century mark resilient and engaged, and we continue to fulfill the evolving and critical needs of our customers.

This past December, when Lawrence Livermore National Lab announced the historic breakthrough achievement of fusion ignition, I was reminded that we were there with the first laser crystals for both the Nova Fusion Facility in the 1980s, and the LLNL National Ignition Facility throughout the 1990s and early 2000s. Currently, we supply one-of-a-kind bent x-ray crystals to NIF and other laser plasma fusion labs, as well as to magnetic confinement fusion facilities worldwide. While commercial fusion energy may still be decades away, Inrad Optics is at the forefront of this essential research, providing our x-ray assemblies to research labs around the globe.

To enhance stakeholders' understanding of our contributions in x-ray-based research and other markets, we have made a small but vital change in how we describe product segments. The new segmentation now includes UV-IR Optics (glass and crystal), X-ray Optics, and Metal Substrate Optics, providing a clearer depiction of our product focus and operational strategy.

Looking back, 2022 was a year of mostly positive developments. We achieved the Company's second consecutive year of positive net income in each quarter. I am also delighted to report that this trend continues in Q1 & Q2 of 2023, representing a significant and long-sought operational success. Our concerted efforts to execute our strategic plan are yielding tangible results.

Record bookings of $18.7M in 2022, slightly above the 2021 total of $17.9M, have helped solidify our future. Customers placed multi-year orders in both of the last two years to secure capacity for their critical optical requirements. Our Process Control and Metrology market segment, where we provide both UV-IR optics and X-ray optics, continues to flourish. Government investments, such as the US Chips Act and similar European Chips legislation, are fueling demand from semiconductor equipment manufacturers as new semiconductor fabs break ground.

Although we worked hard to ramp our production capacity, revenue for the year decreased by 6.4% to $10.6M compared to the prior year's $11.4M. This was due to two factors: capacity constraints as we trained employees and brought on new equipment, and last-time shipments of legacy products totaling $734K in 2021, compared to $188K in 2022—a result we expected. I am pleased to point out that for the first half of 2023, we reported a 27% increase in shipments, totaling $6.6M compared to $5.2M for the same period in 2022.

In 2022 and continuing in 2023, several long-time customers partnered with us in new ways, offering assistance in funding capex to build capacity and consigning new metrology tools to help us grow our inspection capabilities. We appreciate our customers' confidence in our ability to meet their growing demand. Additionally, we were able to execute on several other significant capex purchases, while maintaining and marginally increasing cash at year-end. We continue to make careful investments in 2023 to meet current and future customer requirements.

Our leadership team is energized by the clear opportunity set before us, driven by the extraordinary demand for our unique capabilities and products. Last year, I mentioned the challenges we faced in building our workforce, and I am pleased to report that we have had good success in bringing in new talent over the past 14 months. The equipment capacity ramp continues in conjunction with the recommissioning of manufacturing space for in-demand products.

As we celebrate our 50-year mark, I am optimistic about the future and look forward to the role Inrad Optics will continue to play in enabling our customers' success. As optics and photonics assume a progressively larger role in day-to-day life, I am quite proud of the contributions we make to help improve the world. I look forward to sharing the next chapters of our story and offer my thanks for your continued support.

Amy Eskilson
August 14, 2023

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

FORM 10-K

(Mark One)

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

For the fiscal year ended: December 31, 2022

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: 0-11668

Inrad Optics, Inc.
(Exact name of registrant as specified in its charter)

New Jersey	**22-2003247**
State or other jurisdiction of incorporation or organization	(I. R. S. Employer Identification No.)
181 Legrand Avenue, Northvale, NJ	**07647**
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code **201-767-1910**

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

Title of each class	Trading Symbol	Name of each exchange on which registered
N/A	N/A	N/A

Securities registered pursuant to section 12(g) of the Act:
Common stock, par value $.01 Per Share

Indicate by check mark if 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 file, or a smaller reporting company. See definition of large accelerated filer, accelerated filer and smaller reporting company in Rule 12b2 of the Exchange Act. (Check one):

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

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant 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.☐

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes ☐ No ☒

State the aggregate market value of the voting and non-voting common equity held by non-affiliates computed by reference to the price at which the common equity was last sold, or the average bid and asked price of such common equity, as of the last business day of the registrant's most recently completed second fiscal quarter. $5,762,963. (For purposes of determining this amount, only directors, executive officers, and shareholders with voting power of 10% or more of our stock have been deemed affiliates.)

Indicate the number of shares outstanding of each of the registrant's classes of common stock, as of the latest practicable date.

Common Shares outstanding as of March 30, 2023 –14,200,975 shares

DOCUMENTS INCORPORATED BY REFERENCE

None.

Inrad Optics, Inc.

INDEX

PART 1

Caution Regarding Forward Looking Statements

This Annual Report contains forward-looking statements as that term is defined in the federal securities laws. The Company wishes to ensure that any forward-looking statements are accompanied by meaningful cautionary statements in order to comply with the terms of the safe harbor provided by the Private Securities Litigation Reform Act of 1995. The events described in the forward-looking statements contained in this Annual Report may not occur. Generally, these statements relate to business plans or strategies, projected or anticipated benefits or other consequences of the Company's plans or strategies, or projections involving anticipated revenues, earnings, or other aspects of the Company's operating results. The words "may," "will," "expect," "believe," "anticipate," "project," "plan," "intend," "estimate," and "continue," and their opposites and similar expressions are intended to identify forward-looking statements. The Company cautions you that these statements are not guarantees of future performance or events and are subject to a number of uncertainties, risks, and other influences, many of which are beyond the Company's control, which may influence the accuracy of the statements and the projections upon which the statements are based. Factors that may cause or contribute to such differences include, but are not limited to, those discussed in more detail in Item 1 (Business) and Item 1A (Risk Factors) of Part I and Item 7 (Management's Discussion and Analysis of Financial Condition and Results of Operations) of Part II of this Annual Report on Form 10-K. Any one or more of these uncertainties, risks, and other influences could materially affect the Company's results of operations and whether forward-looking statements made by the Company ultimately prove to be accurate. Readers are further cautioned that the Company's financial results can vary from quarter to quarter, and the financial results for any period may not necessarily be indicative of future results. The foregoing is not intended to be an exhaustive list of all factors that could cause actual results to differ materially from those expressed in forward-looking statements made by the Company. The Company's actual results, performance and achievements could differ materially from those expressed or implied in these forward-looking statements. The Company undertakes no obligation to publicly update or revise any forward-looking statements, whether from new information, future events, or otherwise, except as otherwise required by law.

Item 1. Business

Inrad Optics, Inc. (the "Company," "Inrad," or "we"), was incorporated in New Jersey in 1973. The Company develops, manufactures, and markets products and services for use in photonics enabled industry sectors.

The Company is a vertically integrated manufacturer specializing in glass, crystal, and metal based optical components, and sub-assemblies. Manufacturing capabilities include super-precision optical surfacing, precision diamond turning, the ability to handle large substrates, proprietary optical contacting processes, thin film coatings, and high resolution in-process metrology.

Inrad Optics' customers include leading corporations in the semiconductor equipment, process control and metrology, defense, aerospace, and laser systems sectors of the broad set of photonics enabled industries, as well as the U.S. Government, National Laboratories and universities and institutions worldwide.

Administrative, engineering and manufacturing operations are in a 42,000 square foot building located in Northvale, New Jersey.

Products Manufactured by the Company

The Company built its reputation on its ability to grow and fabricate crystalline materials. As original equipment manufacturers (OEM) demand waned for such crystals the Company transitioned to a vertically integrated photonics manufacturer focused in three main categories: Ultraviolet (UV) to Infrared Optical Components (IR), X-ray Imaging Optics, and Metal Substrate Optics.

The Company offers thin-film coating services, opto-mechanical design for manufacturability, and complex assembly services as part of its deliverables, and supports prototyping through production requirements across all three product areas.

UV-IR Optics and Assemblies

The Company specializes in high-end precision components and sub-assemblies. It develops, manufactures, and delivers precision custom optics and thin film optical coatings. Glass and single crystal substrates are processed to specific customer requirements using complex and often proprietary techniques to manufacture components, deposit optical thin films, and assemble sub-components used in advanced photonic systems. Planar, prismatic, and spherical components are fabricated from glass and synthetic crystals, including fused silica, germanium, quartz, silicon, zinc selenide, zinc sulfide, and other optical glasses.

Components consist of large form factor transmission flats, optical windows for airborne applications, multi-element optical assemblies, lenses, mirrors, polarizing optics, prisms, and wave plates. The Company specializes in super-precision interferometer and transmission flats up to 480mm diameter across a variety of optical materials, as well as multi-element optical assemblies utilizing adhesive free optical contacting and other bonding processes.

Most optical components and sub-assemblies in the UV-IR range require thin film coatings on their surfaces. Depending on the design, optical coatings can refract, reflect, and transmit specific wavelengths. Optical coating specialties include anti-reflective high laser damage resistance, highly reflective, infra-red, polarizing, and coating to complex multi- wavelength requirements on a wide range of substrate materials. Coating deposition process technologies employed include electron beam, ion and plasma assisted deposition, and thermal deposition of multi-layer coating designs.

X-Ray Imaging Optics

Using proprietary optical polishing and proprietary adhesive free bonding techniques, the Company fabricates high-performance bent x-ray monochromators from a large selection of crystal materials and orientations. The Company’s implementation of exacting metrology and specialized processing techniques enable it to develop flat and bent x-ray crystals curved to different shapes with arcsecond precision, verified quality, and high orientation accuracy. This technology is used in OEM and research and development (R&D) high-impact applications, including x-ray photoelectron spectroscopy (XPS) for elemental surface analysis applications in semiconductor wafer inspection, life science and micro-probe chemical analysis. The Company’s bent x-ray crystal assemblies have wide deployment in government R&D facilities for synchrotron beamline focusing and plasma diagnostics in nuclear fusion energy research. Overall, the Company’s products in this area have substantial market impact and the Company has continuously driven innovation to better serve the changing needs of x-ray optics customers.

Metal Substrate Optics and Assemblies

The Company manufactures precision aspheres, large and small metal mirrors, low RMS surface finish polished mirrors, reflective Porro prisms, and thermally stable optical mirrors. Plating specialties include void-free gold and electroless nickel. Metal substrate optics are produced to customer specifications utilizing high precision diamond machining, polishing, and plating of aluminum, AlBeMet™, beryllium, and stainless steel. Leveraging its unique metal substrate expertise, the Company minimizes assembly distortion of the finished optic and ensures quality through in-house testing. The Company’s design optimization results in lower costs and shortened cycle time while improving repeatability for configured components. This product area has served the defense markets for many years and has evolved to include space-based applications in communications and docking systems.

The following table summarizes the Company’s net sales by product categories during the past two years.

	Years Ended December 31,			
	2022		2021	
Category (In thousands)	**Net Sales**	**%**	**Net Sales**	**%**
UV-IR Optics*	$ 4,877	45.9	$ 5,640	49.7
X-ray Optics	4,379	41.2	3,574	31.5
Metal Substrate Optics	1,375	12.9	2,139	18.8
Total	$ 10,631	100.0	$ 11,353	100.0

* The company no longer separates sales of legacy non-linear and electro-optical crystal components, formerly categorized under Laser Devices and Instrumentation. In 2022 and 2021, the company recorded sales of $188,000 and $724,000 in the Laser Devices and Instrumentation segment, respectively. These sales are included in the UV-IR Optics category.

Sales by Market

The photonics industry serves a broad, fragmented, and expanding set of markets. As technologies are discovered, developed, and commercialized, the applications for photonic systems and devices, and the components embedded within those devices, expand across traditional market boundaries. While a significant part of the Company's business remains firmly in the process control and metrology and defense and aerospace markets, other markets served include OEM manufacturers in the medical and industrial laser market, university research institutes and national labs worldwide. Scanning, detection and imaging technologies for homeland security and surface inspection also provide opportunities for the Company and these sectors are expected to continue to account for potential future growth and demand for our products and capabilities.

In 2022 and 2021, the Company's product sales were made to customers in the following market areas:

	Years Ended December 31,			
	2022		2021	
Market (In thousands)	**Net Sales**	**%**	**Net Sales**	**%**
Aerospace & Defense	$ 3,008	28.3	$ 3,824	33.7
Process Control & Metrology	6,981	65.6	5,656	49.8
Laser Systems	188	1.8	724	6.4
Scientific / R&D	454	4.3	1,149	10.1
Total	$ 10,631	100.0	$ 11,353	100.0

Aerospace & Defense

This market consists of sales to OEM defense electro-optical systems and subsystems manufacturers, U.S. based prime aerospace and defense contractors, and system integrators where the products have the same end-use.

End-use applications for the Company's products in the aerospace and defense sector include military laser systems, military electro-optical systems, satellite-based systems, and missile warning sensors and systems that protect aircraft. The dollar volume of shipments of product within this sector depends in large measure on the U.S. Defense Department budget and its priorities, that of foreign governments, the timing of their release of contracts to their prime equipment and systems contractors, and the timing of competitive awards from this customer community to the Company.

Sales in the aerospace and defense market represented approximately 28.3% and 33.7% of sales in 2022 and 2021, respectively. Sales of $3.0 million in 2022 decreased by approximately $0.8 million, or 21.3% from sales of $3.8 million in 2021.

The Company believes that the aerospace and defense sector continues to represent a significant market for the Company's products. The aerospace and defense sector offers an ongoing opportunity for growth given the Company's capabilities in glass, single crystal, and metal precision optics.

Process Control and Metrology

This market consists of capital equipment manufacturers whose products are used in the areas of manufacturing process and control, optics-based metrology, quality assurance, and inventory and product control. Examples of applications for such equipment include semiconductor wafer inspection, nanoscale surface defect analysis, and optical sensing systems.

Sales in the Process Control and Metrology (PC&M) market increased by approximately $1.3 million, or 23.4% to $7.0 million in 2022, compared to sales of $5.7 million in 2021. Sales in the PC&M market represented 65.6% and 49.8% of total sales in 2022 and 2021, respectively. Increased sales in 2022 were a result of the rising demand for our products, especially products installed in semiconductor capital equipment.

The Company believes that the optical and x-ray inspection segment of the semiconductor industry offers continued growth opportunities which match its capabilities in precision optics, crystal products, and monochromators. Bookings for our products in the PC&M market continued to be strong throughout 2022.

Laser Systems

This market consists principally of customers who are OEM manufacturers of industrial, medical, and R&D lasers. The Company also serves a number of smaller customers in other niche markets and international distributors.

Sales in this market were 1.8% of total sales in 2022 compared to 6.4% of total sales in 2021. Sales in the laser systems market decreased $0.5 million, due to last time orders placed in 2021 for legacy products.

Scientific / R&D

These sales consist of product sales directly to researchers at various educational and research institutions domestically and internationally. A portion of the international sales to this market are through distributors. Sales to customers within the Scientific/R&D market consist primarily of x-ray monochromators for use in plasma physics applications for defense and fusion energy research. Sales of $0.4 million in 2022 decreased approximately $0.7 million, or 60.5% from sales of $1.1 million in 2021, due to timing of research and development activities and long lead times for order delivery.

Major Customers

The Company's sales have historically been concentrated within a small number of customers, although the top customers have varied from year to year.

In 2022, the Company's sales to its top three customers accounted for 50.1% of sales. These customers included two OEM manufacturers of process control and metrology equipment and one U.S.- based defense contractor of electro-optical systems for U.S. and foreign governments. These customers represented 19.7%, 15.3%, and 15.1% of total sales during the year.

Sales to the Company's top five customers represented approximately 68.6% and 53.9%, in 2022 and 2021, respectively. All of these customers are OEM manufacturers either within the aerospace and defense or process control and metrology sectors.

Export Sales

The Company's export sales are primarily to customers in Europe, Israel, and Asia and amounted to approximately 39.0% and 36.6% of product sales in 2022 and 2021, respectively.

Long-Term Contracts

Certain of the Company's agreements with customers provide for periodic deliveries at fixed prices over a long period of time. In such cases, the Company negotiates to obtain firm price commitments, as well as cash advances from its customers for the purchase of the materials necessary to fulfill the order.

Marketing and Business Development

The Company markets its products domestically, through the coordinated efforts of the sales, marketing, and customer service team.

The Company has moved towards a strategy of utilizing these combined sales and marketing resources for cross selling all products across all business lines. This strategy is well suited to the diverse and fragmented markets that utilize photonic technologies.

Non-exclusive independent sales agents are occasionally used in major non-U.S. markets, including the United Kingdom, the European Union, Israel, and Japan.

Sales and marketing efforts are coordinated by the Vice President, Sales and Marketing, to promote our product lines through various means including, participation in trade shows, internet-based marketing, media and non-media advertising and promotions, customer visits, and management of international sales representatives and distributors. Our sales efforts are impacted by remaining COVID-19-related restrictions and protocols.

Backlog

The Company's order backlog at December 31, 2022, was $20.5 million. The Company's order backlog as of December 31, 2021, was $12.4 million. The significant increase in order backlog is due to the high demand for optical and x-ray components from customers in the process control and metrology sector.

We anticipate shipping a majority of the present backlog during fiscal year 2023. However, our current backlog consists of orders with delivery schedules that extend beyond 12 months into the future.

Competition

Within each product category in which the Company's business units are active, there is competition.

Our optical components manufacturing capabilities offer unique solutions designed for highly specialized applications. We are an industry leader in supplying bent crystal analyzers used in x-ray photoelectron spectroscopy, synchrotron beamline focusing, and plasma diagnostics in controlled nuclear fusion research facilities. We are a leading supplier of large precision flats produced in volume for semiconductor defect inspection tools and metrology systems. We have a broad range of materials expertise to produce products across the spectrum from the ultraviolet to the far infrared. Specialized custom optical and opto-mechanical components that we produce are used in military imaging platforms and early warning missile sensing systems. By utilizing a team of scientists, engineers, and manufacturing experts, we believe we have a competitive advantage over traditional optical component manufacturers.

Although price is a principal factor in many product categories, competition is also based on product design, performance, customer confidence, quality, delivery, and customer service. Based on its performance to date, the Company believes that it can continue to compete successfully, although no assurances can be given in this regard.

Competitors for our custom optical components used in military and process control applications include several large publicly traded, broad capability, photonics companies. There is also competition from a range of smaller niche businesses catering to a limited set of product offerings. In metal optics, we have competition for mirrors used in aerospace telescopes and EO/IR modules from large and well-capitalized public companies. There is limited competition in the x-ray optics product segment, where the Company possesses proprietary intellectual property and expertise.

Human Capital

We believe that each employee contributes to the culture of integrity, respect, and commitment to our customers through innovation and teamwork. Our workplace health and safety programs include robust policies, procedures, training programs, and self-audits. Our manufacturing facility is in Northvale, NJ, where we maintain high standards of workplace safety and employee protection. We have also been demonstrating a focus on health and safety in our response to the COVID-19 pandemic, including work-from-home flexibility and requiring those who may be sick to stay home. Measures adopted onsite include multiple COVID-19 safety protocols, such as social distancing, use of personal protective equipment, enhanced cleaning practices, and regular internal communication regarding impacts of the COVID-19 pandemic.

We offer a variety of benefits such as health insurance, paid and unpaid leave, retirement, and life and disability/accident coverage as applicable.

Our commitment to diversity and inclusion is an important driver of Company performance. We have focused recruiting efforts to include individuals from technical training programs and local colleges.

For our manufacturing activities, the speed at which we can recruit, train, and deploy quality new and replacement personnel is an important part of our ability to increase and strengthen our production capacity. We rely upon both employees and resources from staffing firms to meet our needs for direct labor. We face strong competition from companies in the photonics and optics industry as well as a variety of other technology fields to secure the engineering and fabrication talent that we require.

As of the close of business on March 30, 2023, the Company had 59 full-time employees.

Intellectual Property

The Company relies on its manufacturing and technological expertise, know-how, and trade secrets to maintain its competitive position in the industry. The Company takes precautionary and protective measures to safeguard its technical design and manufacturing processes. The Company executes nondisclosure agreements with its employees and, where appropriate, with its customers, suppliers, and other associates.

Regulation

Foreign sales of certain of the Company's products to certain countries may require export licenses from the United States Department of Commerce and/or Department of State. Such licenses are obtained when required. All requested export licenses of Inrad Optics products have been granted or deemed not required.

International Traffic in Arms Regulations ("ITAR") governs much of the Company's domestic defense sector business, and the Company is capable of handling its customers' technical information under these regulations. Inrad Optics, Inc. is registered with the United States Department of State Directorate of Defense Trade Controls and utilizes a supplier base of similarly registered companies.

There are no other federal regulations or any unusual state regulations that directly affect the sale of the Company's products other than those environmental compliance regulations that generally affect companies engaged in manufacturing operations in New Jersey.

Availability of Reports

Our principal executive offices are located at 181 Legrand Avenue, Northvale, N.J. 07647, which also houses our manufacturing operations. Our telephone number is 201-767-1910, and our corporate website address is www.inradoptics.com. We include our website address in this annual report on Form 10-K only as an inactive textual reference and do not intend it to be an active link to our website. The information on our website is not incorporated by reference in this annual report on Form 10-K.

Our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and any amendments to such reports, as well as other documents we file with the Securities and Exchange Commission, are available free of charge on our web site at www.inradoptics.com as soon as reasonably practicable after such reports are electronically filed with, or furnished to the Securities and Exchange Commission ("SEC") (www.sec.gov). We will also provide electronic or paper copies of such reports free of charge upon request made to our Corporate Secretary.

Item 1A. Risk Factors

The Company cautions investors that its performance (and, therefore, any forward-looking statement) is subject to risks and uncertainties. The risks described below are those we currently consider to be material. However, there may be other risks, which we now consider immaterial, or which are unknown or unpredictable, with respect to our business, the markets in which we operate, our competition, the regulatory environment or otherwise that could have a material adverse effect on our business, financial condition, or results of operations.

a. The Company has a history of losses

While we were profitable in 2022 and 2021, we recorded a net loss for each of the years ended December 31, 2020, and 2019. Our history of losses has had an adverse effect on our working capital, total assets, and shareholders' equity. We are unable to predict, with certainty, whether we will continue to be profitable after 2022, and our inability to achieve and sustain profitability may negatively affect our business, financial condition, results of operations, and cash flows.

b. The Company may need to raise additional capital to repay indebtedness and to fund our operations

We may need to raise additional financing to repay our outstanding indebtedness of approximately $2.6 million and to fund our current level of operations. Additional financing, which is not in place at this time, may be from the sale of equity or convertible or other debt securities in a public or private offering, or from an additional credit facility. We may be unable to raise sufficient additional capital on favorable terms, if at all, to supply the working capital needs of our existing operations or to expand our business.

c. A pandemic, epidemic or outbreak of an infectious disease in the United States and globally may adversely affect our business

A pandemic, epidemic or outbreak of an infectious disease occurring in the United States and/or worldwide, may adversely affect production. The spread of an infectious disease, including the COVID-19 virus, which was declared a pandemic by the World Health Organization on March 11, 2020, may also result in the inability of our suppliers to deliver on a timely basis or at all. In addition federal, state, and local governments may curtail and restrict business activities, as well as the ability for our employees to work. Such events may result in a period of business disruption, and in reduced operations, which could materially affect our business, financial condition and results of operations. Any significant infectious disease outbreak, including the COVID-19 pandemic, could result in a widespread health crisis that could adversely affect the economies and financial markets worldwide, resulting in an economic downturn that could impact our business, financial condition and results of operations, including our ability to obtain additional funding, if needed.

The spread of COVID-19 has negatively impacted the global economy and has impacted our operations, including the curtailment of certain of our production activities from a human resource perspective and minor disruptions in our supply chain. The extent to which the global coronavirus pandemic continues to impact our business will depend on future developments, which are highly uncertain and cannot be predicted, including new information that may emerge concerning the severity of COVID-19, and the actions to contain or treat its impact, among others. The Company continues to monitor safety protocols and enhance its business continuity plans for potential exposure in the event of infection in our offices and production facility, or in response to potential mandatory quarantines.

d. The Company has exposure to government markets

Sales to customers in the defense industry represent a significant part of our business. These customers in turn generally contract with government agencies. Most governmental programs are subject to funding approval through congressional appropriations which can be modified or terminated without warning upon the determination of a legislative or administrative body. Appropriations can also be affected by legislation that addresses larger budgetary issues of the U.S. Government which could reduce available funding for most federal agencies, including the Department of Defense. It is difficult to assess how this may impact our defense industry customers and the business we do with them in the future. The loss or failure to obtain certain contracts or a loss of a major government customer could have a material adverse effect on our business, results of operations, or financial condition.

e. The Company’s revenues are concentrated in its largest customer accounts

For the year ended December 31, 2022, five customer accounts represented approximately 68.6% of total revenues. Four customers each accounted for more than 10% of revenues. We are a supplier of custom manufactured components to OEM customers. We have a number of large customers in both the commercial and defense markets, but the relative size and identity of our largest customers may change from year to year. In the short term, the loss of any of these large customer accounts or a decline in demand in the markets which they represent could have a material adverse effect on our business, results of operations, or financial condition.

f. The Company depends on, but may not succeed in, developing and acquiring new products and processes

To meet the Company’s strategic objectives, the Company needs to continue to develop new processes, improve existing processes, and manufacture and market new products. As a result, the Company may continue to make investments in process development and additions to its product portfolio. There can be no assurance that the Company will be able to develop and introduce new products or enhancements to its existing products and processes in a way that achieves market acceptance or other pertinent targeted results. The Company also cannot be sure that it will have the human or financial resources to pursue or succeed in such activities.

g. The Company’s stock price may fluctuate widely

The Company’s stock is thinly traded. Many factors, including, but not limited to, future announcements concerning the Company, its competitors or customers, as well as quarterly variations in operating results, announcements of technological innovations, seasonal or other variations in anticipated or actual results of operations, changes in earnings estimates by analysts or reports regarding the Company’s industries in the financial press or investment advisory publications, could cause the market price of the Company’s stock to fluctuate substantially. In addition, the Company's stock price may fluctuate widely for reasons which may be unrelated to operating results. Also, any information concerning the Company, including projections of future operating results, appearing in investment advisory publications or on-line bulletin boards, or otherwise emanating from a source other than the Company could in the future contribute to volatility in the market price of the Company's common stock.

h. The Company's business success depends on its ability to recruit and retain key personnel

The Company depends on the expertise, experience, and continuing services of certain scientists, engineers, production, and management personnel, and on the Company's ability to recruit additional personnel. There is competition for the services of these personnel, and there is no assurance that the Company will be able to retain or attract the personnel necessary for its success, despite the Company's efforts to do so. The loss of services of the Company's key personnel could have a material adverse effect on its business, results of operations, or financial condition.

i. Many of the Company's customers are in cyclical industries

The Company's business is significantly dependent on the demand its customers experience for their products. Many of their end users are in industries that historically have experienced a cyclical demand for their products. The industries include, but are not limited to, the defense electro-optics industry and the manufacturers of process control capital equipment for the semiconductor tools industry. As a result, demand for the Company's products is subject to cyclical fluctuations, and this could have a material effect on our business, results of operations, or financial condition.

j. The Company's manufacturing processes require products from limited sources of supply

The Company utilizes many relatively uncommon materials and compounds to manufacture its products. Many of the materials have long lead times and the Company's suppliers could fail to deliver sufficient quantities of these necessary materials on a timely basis, or deliver contaminated or inferior quality materials, or markedly increase their prices. Any such actions could have an adverse effect on the Company's business, despite the Company's efforts to secure long term commitments from its suppliers. Adverse results might include reducing the Company's ability to meet commitments to its customers, compromising the Company's relationship with its customers, adversely affecting the Company's ability to meet expanding demand for its products, or causing the Company's financial results to deteriorate.

k. The Company faces competition

The Company encounters substantial competition from other companies positioned to serve the same market sectors. Some competitors may have financial, technical, capacity, marketing, or other resources more extensive than ours, or may be able to respond more quickly than the Company to new or emerging technologies and other competitive pressures. Some competitors have manufacturing operations in low-cost labor regions such as the Far East and Eastern Europe and can offer products at lower prices than the Company. The Company may not be successful in winning orders against the Company's present or future competitors, and competition may have a material adverse effect on our business, results of operations, or financial condition.

l. The Company may not be able to fully protect its intellectual property

The Company does not in general rely on patents to protect its products or manufacturing processes. The Company generally relies on a combination of trade secrets and employee non-compete and nondisclosure agreements to protect its intellectual property rights. There can be no assurance that the steps the Company takes will be adequate to prevent misappropriation of the Company's technology. In addition, there can be no assurance that, in the future, third parties will not assert infringement claims against the Company. Asserting the Company's rights or defending against third-party claims could involve substantial expense, thus materially and adversely affecting the Company's business, results of operations, or financial condition.

m. Data breach and breakdown of information and communication technologies

In the course of our business, we collect and store sensitive data, including intellectual property. We could be subject to service outages or breaches of security systems which may result in disruption, unauthorized access, misappropriation, or corruption of this information. We rely on our information technology systems to effectively manage our operational and financial functions. We increasingly rely on information technology systems to process, transmit, and store electronic information. In addition, a significant portion of internal communications, as well as communication with customers and suppliers, depends on information technology. We are exposed to the risk of cyber incidents in the normal course of business. Cyber incidents may be deliberate attacks for the theft of intellectual property, other sensitive information or cash or may be the result of unintentional events. Like most companies, our information technology systems may be vulnerable to interruption due to a variety of events beyond our control, including, but not limited to, physical or electronic break-ins, vendor service outages, terrorist attacks, telecommunications failures, computer viruses, hackers, foreign governments, and other security issues. We have technology security initiatives and data recovery plans in place to mitigate our risk to these vulnerabilities, but these measures may not be adequate, or implemented properly, or executed timely to ensure that our operations are not disrupted. We have insurance coverage for cyber liability, but there can be no assurances that the amount of coverage will be adequate or that insurance proceeds will be available for a particular claim.

Although we have not experienced an incident, potential consequences of a material cyber incident include damage to our reputation, litigation, system disruptions, shutdowns, unauthorized disclosure of confidential information, and increased cyber security protection and remediation costs. Such consequences could materially and adversely affect our results of operations.

n. The Company may be impacted by global political and economic conditions, including acts of war

Terrorism, armed conflict, and acts of war (or the expectation of such events), both in the US and abroad, could also have a significant impact on Inrad Optics' business and the worldwide economy. For instance, the Russia-Ukraine conflict has had an adverse impact, among other things, on certain of our suppliers or customers. The ongoing economic sanctions may further disrupt the supply chain and increase costs where there are limited sources of certain raw materials.

Item 1B. Unresolved Staff Comments

None

Item 2. Properties

Administrative, engineering, and manufacturing operations are housed in a 42,000 square foot building located in Northvale, New Jersey. The lease for the Northvale facility was renewed for a term of three years from June 1, 2022 to May 31, 2025, along with an option to renew the lease for three additional one-year terms running through May 31, 2028, at substantially the same terms. We believe that our existing facility is adequate to meet current and future projected production needs.

Item 3. Legal Proceedings

We are not party to any legal proceedings as of the date hereof.

Item 4. Mine Safety Disclosures

Not Applicable

PART II

Item 5. Market for Registrant's Common Equity and Related Stockholder Matters

a. Market Information

The Company's Common Stock, with a par value of $0.01 per share, is traded on the OTC Pink Sheets under the symbol "INRD."

b. Shareholders

As of March 30, 2023, there were approximately 124 shareholders of record of our Common Stock based on the `Shareholders' Listing provided by the Company's transfer agent. As of the same date, the Company estimates there are an additional 240 beneficial shareholders.

c. Dividends

The Company has not historically paid cash dividends. Payment of cash dividends is at the discretion of the Company's Board of Directors (the "Board") and depends, among other factors, upon the earnings, capital requirements, operations, and financial condition of the Company. The Company does not anticipate paying cash dividends in the foreseeable future.

d. Recent Sales of Unregistered Securities

There have been no sales of unregistered securities during the past year.

Item 6. Reserved

Not Applicable

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operation

The following discussion and analysis should be read in conjunction with the Company's consolidated financial statements and the notes thereto presented elsewhere herein. The discussion of results should not be construed to imply any conclusion that such results will necessarily continue in the future.

Critical Accounting Policies

The Company's significant accounting policies are described in Note 1 of the Consolidated Financial Statements. The Company's consolidated financial statements were prepared in accordance with accounting principles generally accepted in the United States of America. In preparing the Company's financial statements, the Company made certain estimates and judgments that affect the results of operations and the value of assets and liabilities the Company reports. We base these significant judgments and estimates on historical experience and other applicable assumptions we believe to be reasonable based upon information presently available. These estimates may change as new events occur, as additional information is obtained, and as our operating environment changes. These changes have historically been minor and have been included in the financial statements as soon as they became known. Actual results could materially differ from our estimates under different assumptions, judgments, or conditions.

Management has discussed the development and selection of these critical accounting policies and estimates with the Audit Committee of the Board of Directors and the Audit Committee has reviewed the related disclosure. The Company believes that the following summarizes critical accounting policies that require significant judgments and estimates in the preparation of the Company's consolidated financial statements:

Revenue Recognition

Revenue from the Company's sales continue to generally be recognized either when products are shipped (i.e., point in time) or under certain long-term government contracts, as the Company transfers control of the product or service to its customers (i.e., over time), which approximates the previously used percentage-of-completion method of accounting.

Inventory

Inventories are stated at the lower of cost (first-in, first-out method) or net realizable value. Cost of manufactured goods includes material, labor and overhead.

The Company records a reserve for slow moving inventory as a charge against earnings for all products identified as surplus, slow moving, or discontinued. Excess work-in-process costs are charged against earnings whenever estimated costs-of-completion exceed unbilled revenues.

Stock-based compensation

Stock based compensation expense is estimated at the grant date based on the fair value of the award. The Company estimates the fair value of stock options granted using the Black-Scholes option pricing model. The fair value of restricted stock units granted is estimated based on the closing market price of the Company's common stock on the date of the grant. The fair value of these awards, adjusted for estimated forfeitures, is amortized over the requisite service period of the award, which is generally the vesting period.

Income Taxes

Deferred income taxes are provided on the asset and liability method whereby deferred tax assets are recognized for deductible temporary differences and operating loss and tax credit carry forwards and deferred tax liabilities are recognized for taxable temporary differences. Temporary differences are the differences between the amounts of assets and liabilities recorded for income tax and financial reporting purposes. Deferred tax assets are reduced by a valuation allowance when, in the opinion of management, it is more likely than not that some portion or all of the deferred tax assets will not be realized. Deferred tax assets and liabilities are adjusted for the effects of changes in tax laws and rates on the date of enactment.

The Company recognizes the financial statement benefit of an uncertain tax position only after determining that the relevant tax authority would more likely than not sustain the position. For tax positions meeting the more likely than not threshold, the amount recognized in the financial statements is the largest benefit that has a greater than 50 percent likelihood of being realized upon ultimate settlement with the relevant tax authority.

The Company classifies interest and penalties related to income taxes as income tax expense in its Consolidated Financial Statements.

Leases

The Company entered into an amendment and extension of its building lease on July 25, 2022, retroactive to June 1, 2022. Under the guidance of ASU 2016-02, Leases (Topic 842), the Company must determine if such an arrangement contains a lease and whether that lease meets the classification criteria of a finance or operating lease at inception of the arrangement. The Company determined that this lease is an operating lease and presented as a right-of-use lease asset, short term lease liability and long-term lease liability on the consolidated balance sheet. These assets and liabilities are recognized at the commencement date based on the present value of remaining lease payments over the lease term using the Company's incremental borrowing rate.

Results of Operations

The following table sets forth, for the past two years, the percentage relationship of statement of operations categories to total revenues.

	Years ended December 31,	
	2022	2021
	%	%
Revenues:		
Product sales	100.0 %	100.0 %
Costs and expenses:		
Cost of goods sold	70.8	69.4
Gross profit margin	29.2	30.6
Selling, general and administrative expenses	26.2	22.4
Operating income (loss)	3.0	8.2
Net income (loss)	1.4	15.4

Revenues

Sales were $10.6 million in 2022, a decrease of 6.4% or $0.7 million, compared to $11.4 million in 2021. The decrease in sales from 2021 to 2022 was due to capacity restraints as the Company hired and trained new employees and acquired additional capital equipment.

Sales to the defense and aerospace market in 2022 decreased 21.3% or $0.8 million to $3.0 million from $3.8 million in 2021. Sales in the defense and aerospace market represented 28.3% and 33.7% of total sales in 2022 and 2021, respectively. The decrease in revenue in this market was due to a decrease in the demand for our products.

Sales in the process control and metrology market increased $1.3 million, or 23.4% to $7.0 million in 2022 from $5.7 million in 2021. Sales in the process control and metrology market represented 65.6% and 49.8% of total sales in 2022 and 2021, respectively. Increased demand for process control and metrology components, including critical components in the semiconductor capital equipment market positively impacted sales in 2022 and 2021.

In 2022, the Company served as an OEM supplier of custom optical components within the non-military laser industry. Sales to this and related markets in 2022 were $0.2 million, a decrease of $0.5 million or 74.0% compared to $0.7 million in 2021. Overall, sales of laser devices and related products represented 1.8% and 6.4% of revenues in 2022 and 2021, respectively.

Sales to customers within the Scientific / R&D market were $0.5 million and $1.1 million for the years ended December 31, 2022 and 2021. As a percentage of total sales, this market represented 4.3% and 10.1% sales in 2022 and 2021, respectively. The decrease in sales in this market is due to timing of research and development activities and long lead times for order delivery.

Bookings

The Company booked new orders totaling approximately $18.7 million in 2022. The Company's backlog as of December 31, 2022, was $20.5 million, compared to $12.4 million as of December 31, 2021. The significant increase in year over year bookings is due to extraordinary demand for optical and x-ray components from customers in the process control and metrology sector.

Cost of Goods Sold and Gross Profit Margin

Cost of goods sold as a percentage of sales was 70.8% and 69.4% for years ended December 31, 2022 and 2021, respectively. The cost of goods sold in 2022 was $7.5 million compared to $7.9 million in 2021, a decrease of $0.4 million mainly attributable to the decrease in sales. Indirect labor and overhead and an increase in manufacturing depreciation adversely impacted gross profit margin in 2022.

Selling, General and Administrative Expenses

Selling, general and administrative expenses ("SG&A") were $2.8 million and $2.5 million for the years ended December 31, 2022 and 2021, respectively. SG&A expenses increased due to higher wages and corporate insurance costs, offset by lower depreciation. As a percentage of sales, SG&A was 26.2% of sales in 2022 compared to 22.4% of sales in 2021, primarily reflecting the decrease in sales in 2022.

Operating Income

The Company had operating income of $0.3 million in 2022, compared to an operating income of $0.9 million in 2021.

Other Income and Expenses

Net interest expense was $0.2 million in each of the years ended December 31, 2022 and 2021. Other income reflects the gain on the forgiveness of the PPP loan of $1.0 million recognized in 2021.

Income Taxes

The Company did not record a current provision for income taxes in 2022 or 2021, due to the availability of net operating loss carryforwards to offset taxable income for both federal and state tax purposes.

Net Income (Loss)

As a result of the foregoing, the Company recorded net income of $0.2 million in 2022, compared to net income of $1.7 million in 2021.

Liquidity and Capital Resources

The Company's primary source of liquidity is cash and cash equivalents and on-going collection of our accounts receivable. The Company's major uses of cash in the past three years have been for operating expenses, capital expenditures, and for repayment and servicing of outstanding debt and accrued interest.

As of December 31, 2022, and December 31, 2021, cash and cash equivalents were $2.0 million and $1.8 million, respectively.

On July 22, 2020, the maturity dates of a $1,500,000 Subordinated Convertible Promissory Note to Clarex Limited ("Clarex") and a $1,000,000 Subordinated Convertible Promissory Note to an affiliate of Clarex were each extended to April 1, 2024, from April 1, 2021. The notes bear interest at 6%. Interest accrues yearly and is payable on maturity. Unpaid interest, along with principal, may be converted into securities of the Company as follows: the notes are convertible in the aggregate into 1,500,000 units and 1,000,000 units, respectively, with each unit consisting of one share of common stock and one warrant. Each warrant allows the holder to acquire 0.75 shares of common stock at a price of $1.35 per share. As part of the agreement to extend the maturity date of the notes, the expiration dates of the warrants were extended from April 1, 2024, to April 1, 2027.

The Company paid $0.2 million for interest on the subordinated convertible promissory notes in each of the years ended December 31, 2022 and 2021. Accrued interest of $37,500 is included in accounts payable and accrued liabilities as of December 31, 2022 and 2021.

In total, the Company paid $0.2 million of interest in each of the years ended December 31, 2022 and 2021, on its outstanding debt, including interest paid on the subordinated convertible promissory notes.

Capital expenditures were $0.8 million in 2022 and $0.2 million in 2021. The increase in capital spending reflects the Company's investment in new manufacturing equipment and upgrades to existing equipment.

The Company had a net increase in cash of $0.2 million for the twelve months ended December 31, 2022, compared to a net increase in cash of $0.7 million for the twelve months ended December 31, 2021.

On May 6, 2020, the Company received loan proceeds of approximately $973,000, under the Paycheck Protection Program ("PPP"). The PPP Loan, which was in the form of a promissory note dated May 4, 2020, issued by the Company, originally matured on May 4, 2022, bearing interest at a rate of 1.0% per annum. On January 19, 2021, the Company received notification from the Small Business Association that the Company's Forgiveness Application of the PPP Loan and accrued interest, totaling $980,000, was approved in full, and the Company had no further obligations related to the PPP Loan. Accordingly, the Company recognized a gain from forgiveness on PPP Loan for the year ended December 31, 2021.

Cash flows pertaining to our source and use of cash are presented below (in thousands):

	Years Ended December 31, 2022	Years Ended December 31, 2021
	(in thousands)	
Net cash provided by operating activities	$ 776	$ 861
Capital expenditures	(539)	(222)
Principal payments on debt obligations	(35)	(8)

<u>Overview of Financial Condition</u>

The Company recorded net income of $0.2 million and $1.7 million for the twelve months ended December 31, 2022 and 2021, respectively. The Company's cash and cash equivalents increased to $2.0 million at December 31, 2022, from $1.8 million at December 31, 2021.

The Company's order backlog extends beyond 2022. The Company's management expects that future cash flows from operations and its existing cash reserves will provide adequate liquidity for the Company's operations and working capital requirements through at least March 31, 2024.

<u>Contractual Obligations</u>

<u>Subordinated Convertible Promissory Notes</u>

As of December 31, 2022 and 2021, the outstanding principal on the Subordinated Convertible Promissory Notes was $2.5 million. Interest accrues at 6% annually. For the years ended December 31, 2022 and 2021, the Company recorded interest expense on these notes of $0.2 million in each year.

<u>Notes Payable Other</u>

At December 31, 2022 and 2021, the Company had $0.4 million and $0.2 million outstanding in Notes Payable Other in each year, respectively. Interest accrues annually at a weighted average interest rate of 4.9%. For the years ended December 31, 2022 and 2021, the Company recorded interest expense on Notes Payable Other of $20,000 in 2022 and $7,000 in 2021.

<u>Impact of COVID-19 to Operations</u>

We are conducting business to ensure the safety of our employees and associates actively and earnestly, following all best practice CDC guidelines for prevention in the workplace. We have applied social distancing in our operations and implemented a connected, remote workforce where practicable. We cannot predict what actions may be required by federal, state, or local authorities in the future. Nor can we predict what additional actions or new mandates may have on our customers and suppliers. We continue to actively monitor the situation and may be required to take further actions that alter our business operations or that we determine are in the best interests of our employees, customers, partners, suppliers, and shareholders. It is not clear what the potential effects any such alterations or modifications may have on our business, including the effects on our financial results.

The Company's bookings were stronger in 2022, compared to 2021 and our sales have increased over last year. While sales and marketing efforts were severely impacted by COVID-19 during 2021, such efforts improved significantly in 2022. The Company continues to be impacted by COVID-related restrictions in certain areas and the Company expects that restrictions and other limitations may continue for the foreseeable future. The total impact of the global emergence of COVID-19 on our business and financial results are not completely known, and we cannot predict what impact it may have on our continuing operations and the effect to our financial results.

<u>Item 7A. Quantitative and Qualitative Disclosures about Market Risk</u>

Not Applicable

Item 8. Financial Statements and Supplementary Data

The financial statements and supplementary financial information required to be filed under this Item are presented commencing on page 21 of the Annual Report on Form 10-K and are incorporated herein by reference.

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

The Company's management, including the Chief Executive Officer and the Chief Financial Officer, has evaluated the effectiveness of the design and operation of the Company's disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) as of the end of the period covered by this Annual Report on Form 10-K. Based upon that evaluation, the Company's Chief Executive Officer and Chief Financial Officer have concluded that the disclosure controls and procedures as of December 31, 2022, are effective to ensure that information required to be disclosed in the reports the Company files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and that such information is accumulated and communicated to the Company's management, including the Chief Executive Officer and the Chief Financial Officer, to allow timely decisions regarding disclosure.

b. Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining an adequate system of internal control over financial reporting. Our internal control over financial reporting includes those policies and procedures that:

- pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets;

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

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

Due to its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate. All internal control systems, no matter how well designed, have inherent limitations. Therefore, even those systems determined to be effective can provide only reasonable assurance with respect to financial statement preparation and presentation. Because of the inherent limitations of internal control, 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 assessed the effectiveness of the Company's system of internal control over financial reporting as of December 31, 2022. In making this assessment, management used the framework in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"). Based on our assessment and the criteria set forth by COSO, management has concluded that the Company maintained effective internal control over financial reporting as of December 31, 2022.

c. Changes in Internal Control over Financial Reporting

There have been no changes in the Company's internal control over financial reporting identified in connection with the evaluation that occurred during the Company's last fiscal quarter that have materially affected, or that are reasonably likely to materially affect, the Company's internal controls over financial reporting.

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

Executive Officers and Directors

The following table sets forth the name and age of each executive officer and director of the Company, the period during which each such person has served as an executive officer or director and the current position with the Company held by each such person:

Name	Age	Since	Position with the Company
Amy Eskilson	62	2012	President and Chief Executive Officer
Theresa A. Balog	61	2019	Chief Financial Officer, Corporate Secretary and Treasurer
George Murray	59	2013	Vice President of Sales and Marketing
Jan M. Winston	86	2000	Chairman of the Board
William J. Foote	72	2017	Director of the Company
Luke P. LaValle, Jr.,	80	2005	Director of the Company
Dennis G. Romano	80	2009	Director of the Company
N.E. Rick Strandlund	79	2009	Director of the Company

Amy Eskilson has served as President and Chief Executive Officer of Inrad Optics since October 2012 and served as Inrad Optics' Vice President of Sales and Marketing from February 2011 through October 2012. Prior to joining the Inrad Optics team, Ms. Eskilson spent 18 years with Thorlabs, Inc., a photonic tools catalogue company, where she served as Director of Business Development from 2001 to 2011. In this role, Ms. Eskilson coordinated a team responsible for a total of eight acquisitions and foster the development of multiple partner companies, technology transfers and IP license agreements. Ms. Eskilson was also involved in photonic start-ups Nova Phase, Inc., Menlo Systems, Inc. and Idesta Quantum Electronics. Honored in 2021 as an Optica Fellow for her contributions to the photonics industry, as well as a long history of advocacy for the optics & photonics community, Ms. Eskilson continues to be an active Optica volunteer. She is a member of the Steering Committee of the National Photonics Initiative and serves as a Trustee of the New Jersey Manufacturing Extension Partnership. She received her BA in Communications from Montclair State University.

Theresa Balog has served as the Chief Financial Officer, Secretary, and Treasurer since joining Inrad Optics in May 2019. As CFO, Ms. Balog oversees the accounting, business support, financial planning and analysis, treasury, and human resources functions at Inrad Optics. Ms. Balog has previously served as chief financial officer for Clear Align, LLC and MakerBot Industries, Vice President and Global Controller and Chief Accounting Officer for VWR International, Executive Director for MSCI, Inc., and Vice President and Controller for KeySpan Energy. Ms. Balog holds a BBA in Accounting from St. Mary's College, a Master's Degree in Accounting from the University of Delaware, a Master's Degree in Human Resource Management from Wilmington University, and DBA from Northcentral University. Ms. Balog serves on the Advisory Board of the Accounting and MIS Department at the University of Delaware and mentors undergraduate business students in the University's Lerner Executive Mentoring Program. She is a licensed CPA in the state of Delaware.

George Murray has served as Vice President, Sales & Marketing at Inrad Optics since 2013. Mr. Murray joined the Company as Sales Manager, West Region in 2010. Previously, Mr. Murray managed the sales and marketing activities at Axsys Technologies Imaging Systems (now part of General Dynamics), a premier supplier of optical components. He also held increasingly responsible roles in applications engineering, product marketing, and sales management which included international sales territories at Photon Dynamics, now a division of KLA Corporation, and Gerber Scientific. Mr. Murray holds a Bachelor of Science degree in Mechanical Engineering from the University of Connecticut and an MBA from Rensselaer Polytechnic Institute in Hartford, CT.

Jan M. Winston has served as Chairman of the Board since 2009 and has been a member of Board since 2000. Mr. Winston also has served as a Management Consultant of the Winston Consulting since 1997. From 1981 through 1997, Mr. Winston served as a Division Director/General Manager at IBM Corporation. Mr. Winston has an AB degree from Princeton University and attended the Columbia Graduate School of Business Administration.

William J. Foote has been a director since 2017. Mr. Foote served as the Company's VP and Chief Accounting Officer from 2018-2019 and as its Chief Financial Officer from 2006-2018. Mr. Foote also gained extensive experience in finance and accounting through a number of senior financial roles with small and mid-cap private and public manufacturing companies, Mr. Foote is a CPA and a certified professional accountant in Canada, and is a member of the Illinois Society of CPAs and the AICPA. Mr. Foote holds a BA from Carleton University in Ottawa and a Master's Degree in Accounting from the University of British Columbia.

Luke P. LaValle, Jr. has been a director since 2005. Currently, Mr. LaValle serves as the Chairman, Chief Executive Officer and co-Chief Investment Officer of American Capital Management Inc., a boutique investment management firm, since 1980. He has a BS from Boston College and an MBA from the University of Massachusetts. Mr. LaValle is a retired Lieutenant Colonel, Military Intelligence, U.S. Army Reserve and served with the 101st Airborne Division and on the Army Staff, The Pentagon.

Dennis G. Romano has been a director since 2009. From 2002-2007, Mr. Romano served as the Senior Vice President of Business Development, Defense Business Unit, Washington Group International, a provider of engineering construction and technical services. Mr. Romano holds a Bachelor of Science degree and Master of Science degree in Physics from Adelphi University.

N.E. Rick Strandlund has been a director since 2009. From 2005-2008, he served as the Chairman, President and CEO of Nanoproducts Corporation, a producer and developer of nanoproduct materials and technologies. Mr. Strandlund has served on the Board of Directors for Research Electro-Optics (a private company) and served as the Chairman of the Board for NanoProducts Corporation (a private company). Mr. Strandlund holds an MBA in management from Golden Gate University and a Bachelor of Science degree in Aerospace Engineering from San Diego State University.

Family Relationships

There are no family relationships among any of our directors or executive officers.

Code of Ethics

The Company has adopted a Code of Ethics that applies to the Company's principal executive officer, principal financial officer, principal accounting officer or controller (or persons performing similar functions). A copy of such Code of Ethics is available on the Company website at www.inradoptics.com and will be made available without charge and upon written request addressed to the attention of the Secretary of the Company and mailed to the Company's principal executive offices, 181 Legrand Avenue, Northvale, NJ 07647. If the Company makes any substantive amendments to the Code of Ethics or grants any waiver, including any implicit waiver from a provision of the Code of Ethics to its directors or executive officers, the Company will disclose the nature of such amendments or waiver in its website or in a current report on Form 8-K.

Composition of the Board

The Board currently consists of six members. The Company's directors hold office until their successors have been elected and qualified or until the earlier of their resignation or removal.

The Board is divided into three classes (Class I, Class II and Class III) with directors of the Board (collectively, "Directors") in each class serving staggered three-year terms. At each annual meeting of shareholders, the terms of Directors in one of these three classes expire. At that annual meeting of shareholders, Directors are elected to a Class to succeed the Directors whose terms are then expiring, with the terms of that Class of Directors so elected to expire at the third annual meeting of shareholders, thereafter. Our directors are divided among the three classes as follows:

- The Class I directors are Dennis G. Romano and N.E. Rick Strandlund; their terms will expire at the annual meeting of stockholders to be held in 2023.
- The Class II directors are William J. Foote and Luke P. LaValle, Jr.; their terms will expire at the annual meeting of stockholders to be held in 2024.
- The Class III directors are Amy Eskilson and Jan M. Winston; their terms will expire at the annual meeting of stockholders to be held in 2025.

The by-laws of the Company provide for a range of no less than four and no more than six directors.

Audit Committee

The Company has a separately designated standing Audit Committee. Luke P. LaValle, Jr. has served as the Audit Committee Chairman since assuming the role in December 2006. The three other members of the Audit Committee are Messrs. Romano, Strandlund, and Winston. The Board has determined that the members of the Audit Committee each satisfy the requirements for independence under applicable SEC rules, as well as the independence standards of the NASDAQ Stock Market.

The Board of Directors has determined that Mr. LaValle is an "audit committee financial expert" as such term is defined under applicable SEC rules.

Item 11. Executive Compensation

The following tables and accompanying disclosure set forth information about the compensation earned by our named executive officers during 2022. Our named executive officers include our principal executive officer and the two most highly compensated executive officers (other than our principal executive officer) serving as executive officers as of December 31, 2022, as set forth below:

- Amy Eskilson, President and CEO;
- Theresa Balog, CFO; and
- George Murray Vice President, Sales & Marketing.

Summary Compensation Table

The following Summary Compensation Table sets forth, for the years ended December 31, 2022 and 2021, the compensation paid by the Company and its Subsidiaries, with respect to the Company's named executive officers.

Name & Principal Position	Year	Salary $	Bonus $	Option Awards $ (1)(2)	All Other Compensation $(3)	Total $
Amy Eskilson	2022	212,000	25,000	51,000	10,665	299,165
President & CEO	2021	198,763	—	28,250	9,484	239,247
Theresa Balog	2022	182,000	20,000	30,900	8,490	241,390
Chief Financial Officer	2021	169,229	—	16,950	8,062	195,891
George Murray	2022	158,000	22,500	30,900	8,123	219,523
Vice President, Sales & Marketing	2021	148,931	—	11,300	7,114	168,445

(1) The aggregate grant date fair value of option awards and stock awards are computed in accordance with FASB ASC Topic 718, in accordance with SEC rules. The valuation is based on the assumptions set forth in Note 10 to our Consolidated Financial Statements in this annual report.

(2) On February 24, 2022, 50,000, 30,000, and 30,000 stock options were awarded to Ms. Eskilson, Ms. Balog, and Mr. Murray respectively. The options have an exercise price of $1.20 and a fair value of $1.03 per share. On March 24, 2021, 50,000, 30,000, and 20,000 stock options were awarded to Ms. Eskilson, Ms. Balog, and Mr. Murray, respectively. The options have an exercise price of $0.62 per share and a fair value of $0.57 per share. All stock options granted in 2022 and 2021 have a ten-year term and vest over three years, one-third each year upon the anniversary of the grant. The amounts reflect the aggregate grant date fair value of each award.

(3) All Other Compensation includes the fair value of Company stock and cash contributed in 2022 and 2021, as a match to the Company's Section 401(k) Plan for individual executive contributions to the Plan in the 2022 and 2021 Plan years, respectively.

Employment Agreements

The Company has not entered into any employment agreement with any of Ms. Eskilson, Ms. Balog, or Mr. Murray.

Outstanding Equity-Based Awards at Fiscal Year-End

The following table provides information pertaining to vested and non-vested stock options held by each of the executive officers named in the Summary Compensation Table as of December 31, 2022.

	Option Awards (1)			
Name & Principal Position	**Number of Securities Underlying Unexercised Options (#) Exercisable**	**Number of Securities Underlying Unexercised Options (#) Unexercisable**	**Option Exercise Price $**	**Option Expiration Date**
Amy Eskilson	—	50,000	1.20	02/24/32
President & CEO	16,667	33,333	0.62	02/24/31
	40,000		0.71	02/27/29
	40,000		1.00	07/03/28
	40,000		0.57	01/18/27
	40,000		0.35	02/22/26
	25,000		0.19	01/13/25
	20,000		0.27	01/21/24
Total	221,667	83,333		
Theresa Balog	—	30,000	1.20	02/24/32
Chief Financial Officer	10,000	20,000	0.62	02/24/31
	10,000	5,000	1.48	02/12/30
	15,000	—	1.80	05/16/29
Total	35,000	55,000		
George Murray	—	30,000	1.20	02/24/32
Vice President, Sales & Marketing	6,667	13,333	0.62	02/24/31
	20,000	—	0.71	02/27/29
	20,000	—	1.00	07/03/28
	15,000	—	0.57	01/18/27
	15,000	—	0.35	02/22/26
	20,000	—	0.19	01/13/25
Total	96,667	43,333		

(1) Options have a 10-year term and vest over three years, one third each year upon each anniversary of the grant.

Director Compensation

Name	Fees earned or paid in cash $	Option Awards (1)(2) $	Total $
William Foote	18,500	10,300	28,800
Luke P. LaValle, Jr.	18,500	10,300	28,800
N.E. Rick Strandlund	18,500	10,300	28,800
Dennis Romano	18,500	10,300	28,800
Jan M. Winston	23,500	10,300	33,800

(1) The value of stock option awards is computed in accordance with FASB ASC Topic 718. The Option Awards reflect the aggregate grand date fair value of the awards. The Company granted 10,000 stock options with an exercise price of $1.20 to each of the directors on March 24, 2022, and 10,000 stock options with an exercise price of $0.62 to each of the directors on March 24, 2021.

(2) The number of stock options which vested in 2022 to each non-employee director was as follows: William J. Foote, 6,667; Luke P. LaValle, Jr., 6,667; Dennis G. Romano, 6,667; N.E. Rick Strandlund, 6,667; and Jan M. Winston, 6,667. As of December 31, 2022, the aggregate number of option awards outstanding for each non-employee director then serving as a director was as follows: William J. Foote, 125,000; Luke P. LaValle, Jr., 75,000; Dennis G. Romano, 75,000; N.E. Rick Strandlund, 80,000; and Jan M. Winston, 75,000.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The following table gives the information about the Company's Common Stock that may be issued upon the exercise of options, warrants, and rights under the Company's 2010 Equity Compensation Program and the 2020 Equity Compensation Plan, as of December 31, 2022. These Plans were the Company's only equity compensation Plans in existence as of December 31, 2022.

Plan Category	(a) Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants, and Rights	(b) Weighted-Average Exercise Price of Outstanding Options, Warrants, and Rights	(c) Number of Securities Remaining Available for Future Issance Under Equity Compensation Plans (Excluding Securities Reflected in Column (a)
Equity Compensation Plans Approved by Shareholders (1)	1,286,667	$ 0.71	3,600,000
Equity Compensation Plans Not Approved by Shareholders	—	$ —	—
Total	1,286,667	$ 0.71	3,600,000

(1) The 2020 Equity Compensation Program was adopted by the Company's shareholders at the Annual Meeting held on June 23, 2020. Under this Program, an aggregate of up to 4,000,000 shares of common stock may be granted. The 2010 Equity Compensation Program expired on June 2, 2020, and each outstanding option, warrant and right granted under the Program expired on the date determined under the terms of the original award, which in no event, exceeded 10 years. As of December 31, 2022, there was a total of 886,667 options outstanding under the 2010 Plan. In 2022, no stock options expired or were forfeited under the 2010 Plan. Under the 2020 Equity Compensation Plan, a total of 200,000 stock options were awarded to employees during 2022. 66,000 stock options were exercised under the 2010 Equity Compensation Plan in 2022, and no stock options were exercised under the 2020 Equity Compensation Plan in 2022.

The following table presents certain information available to the Company at the date hereof with respect to the security ownership of the Company's Common Stock by (i) each of the Company's directors and nominees, (ii) each named executive officer of the Company, (iii) all executive officers and directors as group, and (iv) each person known by the Company to beneficially own more than five percent (5%) of the Company's common stock outstanding as of December 31, 2022. Percentages that include ownership of options or convertible securities are calculated assuming exercise or conversion by each individual or entity of the options (including "out-of-the-money options"), or convertible securities owned by each individual or entity separately without considering the dilutive effect of option exercises and security conversions by any other individual or entity. Accordingly, the percentages may add to more than 100%. The address of each principal shareholder, unless otherwise indicated, is c/o Inrad Optics, Inc., 181 Legrand Avenue, Northvale, NJ 07647.

Beneficial Ownership of Common Stock

Name and Address of Beneficial Owner	Amount and Nature of Beneficial Ownership	Percent of Common Stock
William J. Foote	159,327 (1)	0.8 %
Luke P. LaValle, Jr.	80,000 (2)	0.4 %
Dennis G. Romano	80,000 (3)	0.4 %
N.E. Rick Strandlund	80,000 (4)	0.4 %
Jan M. Winston	80,000 (5)	0.4 %
Amy Eskilson	464,391 (6)(12)	2.3 %
George Murray	263,292 (7)	1.3 %
Theresa Balog	102,817 (8)(12)	0.5 %
All Directors and Executive Officers as a group (8 persons)	1,309,827 (9)	6.6 %
Clarex Ltd. & Welland Ltd.	7,782,839 (10)	39.3 %
Bay Street and Rawson Square		
P.O. Box N 3016		
Nassau, Bahamas		
Emancipation Management LLC	3,717,787 (11)	18.8 %
825 Third Avenue		
New York, NY 10022		
Inrad Optics, Inc. Employees 401(k) Plan	1,031,309 (12)	5.2 %
Amy Eskilson, as Trustee		
181 Legrand Avenue		
Northvale, NJ 07647		
Minerva Advisors LLC	1,012,252 (13)	5.1 %
50 Monument Road, Suite 201		
Bala Cynwyd, PA 19004		

(1) Including 105,000 shares issuable upon exercise of options exercisable within 60 days of March 30, 2023, 12,934 shares owned, and 32,165 shares allocated to Mr. Foote in the Inrad Optics, Inc. 401(k) Plan over which he has voting and dispotitive power.
(2) Including 65,000 shares issuable upon exercise of options exercisable within 60 days of March 30, 2023, and 5,000 shares owned.
(3) Including 65,000 shares issuable upon exercise of options exercisable within 60 days of March 30, 2023, and 5,000 shares owned.
(4) Including 65,000 shares issuable upon exercise of options exercisable within 60 days of March 30, 2023, and 5,000 shares owned.
(5) Including 65,000 shares issuable upon exercise of options exercisable within 60 days of March 30, 2023, and 5,000 shares owned.
(6) Including 255,000 shares issuable upon exercise of options exercisable within 60 days of March 30, 2023, and 114,391 shares allocated to Ms. Eskison in the Inrad Optics, Inc. 401(k) Plan over which she has voting and dispotitive power.
(7) Including 113,333 shares issuable upon exercise of options exercisable within 60 days of March 30, 2023, and 102,292 shares allocated to Mr. Murray in the Inrad Optics, Inc. 401(k) Plan over which he has voting and dispotitive power.
(8) Including 25,000 shares issuable upon exercise of options excercisable within 60 days of March 30, 2023, and 12,817 shares allocated to Ms. Balog in the Inrad Optics, Inc. 401K Plan over which she has voting and dispotitive power
(9) Including 1,003,993 shares issuable upon exercise of options exercisable within 60 days of March 30, 2023.

(10) Including 2,500,000 shares and warrants to purchase an additional 1,875,000 shares at $1.35 per share which are issuable upon conversion of convertible promissory notes and 50,000 shares issuable upon conversion of accrued interest on convertible promissory notes.

(11) These figures are based upon information set forth in Schedule 13G filed February 1, 2023, on behalf of the following reporting persons:
Emancipation Management LLC (a)
Circle N Advisors, LLC (a)
Charles Frumberg (a)
(a) Each of these reporting persons is deemed a beneficial owner of 3,717,787shares of Inrad Optics, Inc. held by Emancipation with shared investment power but no voting power with respect to these 3,717,787 shares.

(12) These figures are based upon information provided by Amy Eskilson and Theresa Balog, Trustees of the 401(k) Plan. Ms. Eskilson and Ms. Balog, as trustees of the 401(k) Plan, share voting power with respect to the shares held by the 401(k) Plan, but do not have dispositive power over such shares. Ms. Eskilson and Ms. Balog disclaim beneficial ownership of the shares held by the 401(k) Plan, except to the extent of the shares allocated to them in the 401(k) Plan in their individual capacities, and such shares are not refelcted in the amounts of shares listed as being beneficially held in them in individual capacities in this table.

(13) These figures are based upon information set forth in Schedule 13G filed February 14, 2023, on behalf of the following reporting persons:
Minerva Advisors LLC (a)
Minerva Group, LP (a)
Minerva GP, LP
Minerva GP, Inc. (a)
David P. Cohen (a)
(a) Each of these reporting persons is deemed a beneficial owner of 1,012,252 shares of Inrad Optics, Inc. held by Minvera Group, L.P. with both investment power and voting power with respect to these 1,012,252 shares.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The documented ethics policies of the Company restrict certain types of related party transactions between the Company and its directors, officers, and employees of the Company. Specifically, compensation for services provided by directors, officers, and employees to the Company may not be through any source but the Company. The Company’s policies do permit related parties to participate in financial transactions, limited to financing via debt or equity. In such instances, the Company has an informal policy of requiring that the terms of such financing, including but not limited to interest rates and fees, are at least equal to or better than the terms obtainable via financing from other sources. The Audit Committee is responsible for the review and approval of all related party transactions.

On July 22, 2020, the maturity dates of a $1,500,000 Subordinated Convertible Promissory Note to Clarex Limited (“Clarex”) and a $1,000,000 Subordinated Convertible Promissory Note to an affiliate of Clarex were each extended to April 1, 2024, from April 1, 2021. The notes bear interest at 6%. Interest accrues yearly and is payable on maturity. Unpaid interest, along with principal, may be converted into securities of the Company as follows: the notes are convertible in the aggregate into 1,500,000 units and 1,000,000 units, respectively, with each unit consisting of one share of common stock and one warrant. Each warrant allows the holder to acquire 0.75 shares of common stock at a price of $1.35 per share. As part of the agreement to extend the maturity date of the notes, the expiration dates of the warrants were extended from April 1, 2024 to April 1, 2027.

No payments against the total principal of $2,500,000 have been made. In 2022, the Company paid a total of $150,000 in interest on the outstanding Subordinated Convertible Notes described above. Accrued interest on the notes amounted to $37,500 as of December 31, 2022.

Director Independence

The Board has determined that each of Mr. William J. Foote, Mr. Luke P. LaValle, Jr., Mr. Dennis G. Romano, Mr. N.E. Rick Strandlund, and Mr. Jan M. Winston has no material relationship with the Company (other than as director) and is therefore “independent” within the meaning of the current listing standards of the Nasdaq Stock Market and applicable SEC rules. Ms. Eskilson is not an independent director due to her position as President and CEO of the Company. The Company has established an Audit

Committee, a Compensation Committee and a Nominating and Corporate Governance Committee, each of which are comprised of independent directors.

Item 14. Principal Accountant Fees and Services

In accordance with the requirements of the Sarbanes-Oxley Act of 2002 and the Audit Committee's charter, all audit and audit-related work and all non-audit work performed by the Company's independent accountants is approved in advance by the Audit Committee, including the proposed fees for such work. The Audit Committee is informed of each service actually rendered.

Audit Fees.

Audit fees billed or expected to be billed by the Company's principal accountant, PKF O'Connor Davies, LLP (PKF) for the audit of the financial statements included in the Company's Annual Reports on Form 10-K for the year ended December 31, 2022, were $126,000. Audit fees billed or expected to be billed by PKF for the audit of the financial statements included in the Company's Annual Report on Form 10-K for the year ended December 31, 2021, were $120,500.

Audit-Related Fees

The Company was billed $0 by the Company's principal accountants for each of the fiscal years ended December 31, 2022 and 2021, for assurance and related services that are reasonably related to the performance of the audit or review of the Company's financial statements and are not reported under the caption "Audit Fees" above.

Tax Fees

The Company was billed or is expected to be billed an aggregate of $17,000 by the Company's principal accountants for each of the fiscal year ended December 31, 2022, for tax services, principally the preparation of income tax returns. The Company was billed or is expected to be billed an aggregate of $16,500 for tax services, principally the preparation of income tax returns for the fiscal year ended December 31, 2021.

All Other Fees

The Applicable law and regulations provide an exemption that permits certain services to be provided by the Company's outside auditors even if they are not pre-approved. The Company has not relied on this exemption at any time since the Sarbanes-Oxley Act was enacted. The Company did not have any other fees in 2022 and 2021.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) (1) Financial Statements.

Reference is made to the Index to Financial Statements commencing on Page 28.

(a) (2) Financial Statement Schedule.

Reference is made to the Index to Financial Statements on Page 28. All other schedules have been omitted because the required information is not present or is not present in amounts sufficient to require submission of the schedule, or because the information required is included in the Financial Statements or Notes thereto.

(a) (3) Exhibits.

Exhibit No.	Description of Exhibit
3.1	Restated Certificate of Incorporation of Photonics Products Group, Inc. (incorporated by reference to Exhibit 3.1 to the Company's Registration Statement on Form S-1 filed with the Securities and Exchange Commission on August 25, 2004)
3.2	By-Laws of Photonic Products Group, Inc. (incorporated by reference to Exhibit 3.2 to the Company's Registration Statement on Form S-1 filed with the Securities and Exchange Commission on August 25, 2004)
3.3	Certificate of Amendment to Restated Certificate of Incorporation of Photonics Products Group, Inc., dated June 2, 2010 (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on June 7, 2010)
3.4	Certificate of Amendment to Restated Certificate of Incorporation of Photonics Products Group, Inc., dated January 23, 2012 (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on January 23, 2012)
4.1	Specimen Common Stock Certificate (incorporated by reference to Exhibit 4.1 to the Company's Registration Statement on Form S-1 filed with the Securities and Exchange Commission on August 25, 2004)
4.2	Note dated July 22, 2020, held by Clarex, Ltd (incorporated by reference to Exhibit 4.1 to the Company's Quarterly Report on Form 10-Q filed with the Commission on August 14, 2020)
4.3	Note dated July 22, 2020, held by Welland, Ltd. (incorporated by reference to Exhibit 4.2 to the Company's Quarterly Report on Form 10-Q filed with the Commission on August 14, 2020)
4.4	Description of Securities (incorporated by reference to Exhibit 4.4 to the Company's Annual Report on Form 10-K filed with the Securities and Exchange Commission on March 30, 2020)
10.2	2020 Equity Compensation Program (incorporated by reference to Exhibit 10.2 to the Company's Annual Report on Form 10-K filed with the Securities and Exchange Commission on March 30, 2020)
10.3	Amendment and Extension of Lease, dated July 8, 2019, by and between V&R Costa Management, LLC, and Inrad Optics, Inc. (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission on August 14, 2019)
10.4	Amendment and Extension of Lease dated July 29, 2022, by and between V&R. Costa Management LLC, and Inrad Optics, Inc. (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission on August 12, 2022)
14.1	Code of Ethics (incorporated by reference to Exhibit 14.1 to the Company's Annual Report on Form 10-K filed with the Securities and Exchange Commission on March 31, 2006)
21.1	List of Subsidiaries (incorporated by reference to Exhibit 21.1 to the Company's Annual Report on Form 10-K filed with the Securities and Exchange Commission on March 31, 2006)
23.1*	Consent of PKF O'Connor Davies, LLP Independent Registered Public Accounting Firm
31.1*	Certification of Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2*	Certification of Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1**	Certification of Chief Executive Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
32.2**	Certification of Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS*	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL Document
101.SCH*	Inline XBRL Taxonomy Extension Schema Document
101.CAL*	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF*	Inline XBRL Taxonomy Extension Definition Linkbase Document
101.LAB*	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE*	Inline XBRL Taxonomy Extension Presentation Linkbase Document
104*	The cover page from the Company's Annual Report on Form 10-K for the year ended December 31, 2022, has been formatted Inline XBRL

* Filed herewith
** Furnished herewith

Item 16. Form 10-K Summary.

None.

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.

INRAD OPTICS, INC.

By: /s/ Amy Eskilson
Amy Eskilson
Chief Executive Officer

Dated: March 30, 2023

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Jan M. Winston Jan M. Winston	Chairman of the Board	March 30. 2023
/s/ William J. Foote William J. Foote	Director	March 30. 2023
/s/ Luke P. LaValle, Jr. Luke P. LaValle, Jr.	Director	March 30. 2023
/s/ Dennis G. Romano Dennis G. Romao	Director	March 30. 2023
/s/ N.E. Rick Strandlund N.E. Rick Strandlund	Director	March 30. 2023
/s/ Amy Eskilson Amy Eskilson	President, Chief Executive Officer and Director (Principal Executive Officer)	March 30. 2023
/s/ Theresa A. Balog Theresa A. Balog	Chief Financial Officer, Secretary, and Treasurer (Principal Financial and Accounting Officer)	March 30. 2023

INRAD OPTICS, INC. AND SUBSIDIARIES

INDEX TO THE CONSOLIDATED FINANCIAL STATEMENTS

AS OF AND FOR THE YEARS ENDED DECEMBER 31, 2022 and 2021

CONTENTS

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors
Inrad Optics, Inc., and Subsidiaries
Northvale, New Jersey

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Inrad Optics, Inc. and Subsidiaries (the "Company") as of December 31, 2022 and 2021, and the related consolidated statements of operations, shareholders' equity and cash flows for each of the two years in the period ended December 31, 2022, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2022, in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated 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 the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. 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 audit, 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 consolidated 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 consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

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

Valuation of Inventory

As discussed in Note 1 to the consolidated financial statements, the Company values inventories at the lower of cost, determined using the first-in, first-out method, or net realizable value. The Company reviews the components of its inventory on a quarterly basis for products identified as surplus, slow-moving, or discontinued and adjusts inventory to its net realizable value as necessary. The Company's inventory reserves are primarily based on historical, as well as projected, usage of its various inventory products. The inventory reserve at December 31, 2022, totaled \$2.4 million. Net inventories at December 31, 2022, totaled \$2.8 million.

Auditing management's calculations to value inventory involved a high degree of auditor judgment due to the sensitivity of valuation methodologies and the extent of audit effort required to address the matter.

Our principal audit procedures related to the Company's inventory valuation included the following:

- Performed an observation of the Company's physical inventory count, including independent test counts thereon.
- We performed price testing on a sample of raw material inventory by comparing the carrying value of on-hand inventories to the latest purchases that occurred.
- In order to assess the appropriateness of the valuation of work-in-progress and finished goods inventories, we performed testing on a sample of capitalized labor costs and net realizable value of subsequent sales.
- We evaluated management's assumptions used to determine inventory absorption costs and performed a sensitivity analysis to evaluate the changes in inventory valuation that would result from changes in the assumptions.
- Evaluated the appropriateness and consistency of management's methods and assumptions used in developing their assessment of net realizable value and their estimated reserve for slow-moving or excess inventory. We performed an analysis of the inventories' net realizable value and performed analytical testing by performing a year over year comparison of the inventory reserve by product.

We have served as the Company's auditor since 2017.

/s/ PKF O'Connor Davies, LLP

New York, New York
March 30, 2023

PCAOB ID No. 127

* * * * *

INRAD OPTICS, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS

	December 31, 2022	December 31, 2021
Assets		
Current assets:		
Cash and cash equivalents	$ 2,003,485	$ 1,801,188
Accounts receivable, net	1,389,867	1,287,653
Inventories, net	2,825,987	2,524,871
Other current assets	309,287	260,116
Total current assets	6,528,626	5,873,828
Plant and equipment:		
Plant and equipment, at cost	15,967,537	15,393,241
Less: Accumulated depreciation and amortization	(14,723,869)	(14,709,744)
Total plant and equipment	1,243,668	683,497
Precious metals	561,909	561,909
Lease right-of-use, net	737,743	125,724
Other assets	26,993	26,993
Total Assets	$ 9,098,939	$ 7,271,951
Liabilities and Shareholders' Equity		
Current liabilities:		
Current portion of other long term notes	$ 67,513	$ 16,403
Accounts payable and accrued liabilities	741,281	554,604
Contract liabilities	1,065,173	576,474
Current portion of lease obligation	295,978	141,536
Total current liabilities	2,169,945	1,289,017
Related party convertible notes payable	2,500,000	2,500,000
Other long term notes, net of current portion	316,740	157,578
Lease obligation, net of current portion	444,462	2,692
Total liabilities	5,431,147	3,949,287
Shareholders' equity:		
Common stock: $.01 par value; 60,000,000 authorized shares; 14,092,920 shares issued at December 31, 2022, and 13,967,257 shares issued at December 31, 2021	140,931	139,674
Capital in excess of par value	19,925,292	19,733,996
Accumulated deficit	(16,383,481)	(16,536,056)
	3,682,742	3,337,614
Less - Common stock in treasury, at cost (4,600 shares)	(14,950)	(14,950)
Total shareholders' equity	3,667,792	3,322,664
Total Liabilities and shareholders' equity	$ 9,098,939	$ 7,271,951

See Notes to Consolidated Financial Statements

INRAD OPTICS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS

	Years Ended December 31, 2022	2021
Total revenue	$ 10,631,032	$ 11,352,527
Cost and expenses:		
Cost of goods sold	7,529,893	7,874,076
Selling, general and administrative expenses	2,782,082	2,544,102
	10,311,975	10,418,178
Income from operations	319,057	934,349
Other expense:		
Gain on forgiveness of PPP loan	—	973,166
Interest expense-net	(166,482)	(158,618)
	(166,482)	814,548
Income before income taxes	152,575	1,748,897
Income tax (provision) benefit	—	—
Net income	$ 152,575	$ 1,748,897
Net income per common share - basic	$ 0.01	$ 0.13
Net income per common share - diluted	$ 0.01	$ 0.11
Weighted average shares outstanding – basic	14,018,227	13,871,420
Weighted average shares outstanding – diluted	14,724,895	16,630,239

See Notes to Consolidated Financial Statements

INRAD OPTICS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY

	Common Stock		Capital in excess of par value	Accumulated Deficit	Treasury Stock	Total Shareholders' Equity
	Shares	Amount				
Balance - January 1, 2021	13,824,928	$ 138,251	$ 19,516,363	$ (18,284,953)	$ (14,950)	$ 1,354,711
401K contribution	142,329	1,423	101,925	—	—	103,348
Stock-based compensation expense	—	—	115,708	—	—	115,708
Net income December 31, 2021	—	—	—	1,748,897	—	1,748,897
Balance - December 31, 2021	13,967,257	$ 139,674	$ 19,733,996	$ (16,536,056)	$ (14,950)	$ 3,322,664
401K contribution	59,663	597	50,158	—	—	50,755
Stock-based compensation expense	—	—	116,478	—	—	116,478
Common stock options exercised	66,000	660	24,660	—	—	25,320
Net income December 31, 2022	—	—	—	152,575	—	152,575
Balance - December 31, 2022	14,092,920	$ 140,931	$ 19,925,292	$ (16,383,481)	$ (14,950)	$ 3,667,792

See Notes to Consolidated Financial Statements

INRAD OPTICS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Years Ended December 31, 2022	Years Ended December 31, 2021
Cash flows from operating activities:		
Net income	$ 152,575	$ 1,748,897
Adjustments to reconcile net income to net cash provided by (used in) operating activities		
Depreciation and amortization	249,265	166,987
401(k) common stock contribution - non cash item	50,755	103,348
Stock based compensation	116,478	115,708
Gain on forgiveness of PPP loan	—	(973,166)
Capitalized interest on promissory note	—	5,538
Change in inventory reserve	(99,662)	9,700
Changes in operating assets and liabilities:		
Accounts receivable	(102,214)	(463,200)
Inventories	(201,454)	671,485
Other current and non-current assets	(661,190)	(65,574)
Other current and non-current liabilities	596,212	—
Accounts payable and accrued liabilities	186,677	(178,125)
Contract liabilities	488,699	(280,327)
Total adjustments and changes	623,566	(887,626)
Net cash provided by operating activities	776,141	861,270
Cash flows from investing activities:		
Capital expenditures	(539,116)	(221,838)
Net cash (used in) investing activities	(539,116)	(221,838)
Cash flows from financing activities:		
Proceeds from issuance of common stock	25,320	—
Principal payments on notes payable-other	(60,048)	(8,360)
Net cash (used in) provided by financing activities	(34,728)	(8,360)
Net increase in cash and cash equivalents	202,297	671,485
Cash and cash equivalents at beginning of year	1,801,188	1,129,703
Cash and cash equivalents at end of year	$ 2,003,485	$ 1,801,188
Supplemental disclosure of cash flow information:		
Interest paid	$ 171,060	$ 161,948
Income taxes paid	$ —	$ —
Significant non-cash activities:		
Lease right-of-use asset	$ 879,300	$ —
Supplemental disclosure of non-cash investing and financing activities		
Acquisition of equipment by issuing a note payable	$ 270,320	$ —

See Notes to Consolidated Financial Statements

INRAD OPTICS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

TWO YEARS ENDED DECEMBER 31, 2022

1. Nature of Business and Operations and Summary of Significant Accounting Policies and Estimates

a. Nature of Business and Operations

Inrad Optics, Inc. and Subsidiaries (the "Company") was incorporated in the state of New Jersey and is a manufacturer of products and services for use in the photonics industry enabling key applications for the semiconductor metrology, life sciences, and aerospace and defense industries. The company's products include custom glass, single crystal, metal optical components and assemblies, and x-ray imaging crystals and assemblies. Company's principal customers include commercial instrumentation companies and OEM laser systems manufacturers, research laboratories, government agencies, and defense contractors. The Company's administrative offices and manufacturing operations are in Northvale, New Jersey.

b. Liquidity

As of December 31, 2022, the Company had working capital of $4.4 million and cash and cash equivalents of $2.0 million. Management believes based on the Company's operations and its existing working capital resources together with existing cash flows, the Company has sufficient cash flows to fund operations through at least March 31, 2024.

c. Principles of consolidation

The accompanying consolidated financial statements include the accounts of the Company and its wholly owned subsidiaries. Upon consolidation, all inter-company accounts and transactions are eliminated.

d. Use of estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America ("U.S. GAAP") requires management to make certain estimates and assumptions. These estimates and assumptions affect the reported amounts in the consolidated financial statements and accompanying notes. These estimates include, but are not limited to, determining our allowance for doubtful accounts, our allowance for inventory obsolescence, the fair value and depreciable lives of long-lived tangible and intangible assets, and deferred taxes and the associated valuation allowance. Actual results could differ from these estimates.

e. Cash and cash equivalents

The Company considers cash-on-hand and highly liquid investments with original maturity dates of three months or less at the date of purchase to be cash and cash equivalents.

f. Accounts receivable

Beginning in 2023, the Company adopted Accounting Standards Update (ASU) No. 2016-13, Financial Instruments—Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments. ASU 2016-13 requires entities to use a forward-looking approach based on expected losses to estimate credit losses on certain types of financial instruments, including trade receivables.

The Company extends credit to its customers that satisfy pre-defined credit criteria. Accounts receivable are recorded net of an allowance for credit losses. The Company estimates the allowance for credit losses based on an analysis of the aging of accounts receivable, assessment of collectability, including any known or anticipated bankruptcies, customer-specific circumstances, and an evaluation of current economic conditions. Actual write-off of receivables may differ from estimates due to changes in customer and economic circumstances. During 2022 and 2021, a net reduction of $46,000 and $90,000, respectively, in allowances related to customer receivables was recorded due to a change in customers' financial condition, actual and anticipated bankruptcies and other associated claims.

g. Inventories

Inventories are stated at the lower of cost (first-in, first-out method) or net-realizable value. Cost of manufactured goods includes material, labor and overhead.

The Company records a reserve for slow moving inventory as a charge against earnings for all products identified as surplus, slow moving, or discontinued. Excess work-in-process costs are charged against earnings whenever estimated costs-of-completion exceed unbilled revenues.

h. Plant and Equipment

Plant and equipment are depreciated using the straight-line method over the estimated useful lives of the related assets which range between five and seven years. Amortization of leasehold improvements is computed using the straight-line method over the lesser of 10 years or the remaining term of the lease including optional renewal periods, as appropriate, when failure to renew the lease imposes an economic penalty on the Company in such an amount that renewal appears to be probable. In determining the amount of the economic penalty, management considers such factors as (i) the costs associated with the physical relocation of the offices, manufacturing facility and equipment, (ii) the economic risks associated with business interruption and potential customer loss during relocation and transition to new premises, (iii) the significant costs of leasehold improvements required at any new location to custom fit our specific manufacturing requirements, and (iv) the economic loss associated with abandonment of existing leasehold improvements or other assets whose value would be impaired by vacating the facility.

Maintenance and repairs of property and equipment are charged to operations and major improvements are capitalized. Upon retirement, sale or other disposition of property and equipment, the cost and accumulated depreciation are eliminated from the accounts and a gain or loss is recorded.

i. Income taxes

Deferred taxes are provided on the asset and liability method whereby deferred tax assets are recognized for deductible temporary differences and operating loss and tax credit carry forwards and deferred tax liabilities are recognized for taxable temporary differences. Temporary differences are the differences between the amounts of assets and liabilities recorded for income tax and financial reporting purposes. Deferred tax assets are reduced by a valuation allowance when, in the opinion of management, it is more likely than not that some portion of the deferred tax assets will not be realized. Deferred tax assets and liabilities are adjusted for the effects of changes in tax laws and rates on the date of enactment.

The Company recognizes the financial statement benefit of an uncertain tax position only after determining that the relevant tax authority would more likely than not sustain the position. For tax positions meeting the more likely than not threshold, the amount recognized in the financial statements is the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement with the relevant tax authority.

The Company classifies interest and penalties related to income taxes as income tax expense in its Consolidated Financial Statements.

The Company had no unrecognized tax benefits or liabilities, and no adjustment to its financial position, results of operations, or cash flows relating to uncertain tax positions taken on all open tax years. The Company is no longer subject to federal income tax examinations by tax authorities for the years before 2019 and state or local income tax examinations by tax authorities for the years before 2019.

j. Impairment of long-lived assets

Long-lived assets, such as plant and equipment and purchased intangibles with finite lives, which are subject to amortization, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability of assets to be held and used is measured by a comparison of the carrying amount of an asset to estimated undiscounted future cash flows expected to be generated by the asset. If the carrying amount of an asset exceeds its estimated future cash flows, an impairment charge is recognized by the amount by which the carrying amount of the asset exceeds the fair value of the assets. Long-lived assets held for sale would be separately presented in the balance sheet and reported at the lower of the carrying amount or fair value less costs to sell and would no longer be depreciated.

k. Stock-based compensation

Stock based compensation expense is estimated at the grant date based on the fair value of the award. The Company estimates the fair value of stock options granted using the Black-Scholes option pricing model. The fair value of restricted stock units granted is estimated based on the closing market price of the Company's common stock on the date of the grant. The fair value of these awards, adjusted for estimated forfeitures, is amortized over the requisite service period of the award, which is generally the vesting period.

l. Revenue recognition

The Company's revenues are comprised of product sales as well as products and services provided under long-term government contracts with its customers. All revenue is recognized when the Company satisfies its performance obligation(s) under the contract (either implicit or explicit) by transferring the promised product or service to its customer either when (or as) its customer obtains control of the product or service. A performance obligation is a promise in a contract to transfer a distinct product or service to a customer. A contract's transaction price is allocated to each distinct performance obligation. The majority of the Company's contracts have a single performance obligation, as the promise to transfer products or services is not separately identifiable from other promises in the contract and, therefore, not distinct. For contracts with multiple performance obligations, the Company allocates the contract's transaction price to each performance obligation using the Company's best estimate of standalone selling price for each distinct product or service in the contract, which is generally based on an observable price.

Revenue is measured as the amount of consideration the Company expects to receive in exchange for transferring products or providing services. As such, revenue is recorded net of returns, allowances, customer discounts, and incentives. Sales, value added, and other taxes collected from customers and remitted to governmental authorities are accounted for on a net (excluded from revenues) basis. Shipping and handling costs are included in cost of goods sold.

The Company's performance obligations under long-term government contracts are generally satisfied over time. Revenue from products or services transferred to customers over time accounted for approximately 0.0% and 0.4% of revenue for 2022 and 2021, respectively. Revenue under these long-term government contracts is generally recognized over time using an input measure based upon the proportion of actual costs incurred to estimated total project costs, which is a method used to best depict the Company's performance to date under the terms of the contract.

Accounting for these long-term government contracts involves the use of various techniques to estimate total revenue and costs. The Company estimates profit on these long-term government contracts as the difference between total estimated revenue and expected costs to complete a contract and recognizes that profit over the life of the contract. Contract estimates are based on various assumptions to project the outcome of future events that may span several years. These assumptions include, among other things, labor productivity, costs and availability of materials, and timing of funding by the U.S. government. The nature of these long-term agreements may give rise to several types of variable consideration, such as claims, awards, and incentive fees. Historically, these amounts of variable consideration are not considered significant. Additionally, contract estimates may include additional revenue for submitted contract modifications if there exists an enforceable right to the modification, the amount can be reasonably estimated, and its realization is probable. These estimates are based on historical collection experience, anticipated performance, and the Company's best judgement at the time. These amounts are generally included in the contract's transaction price and are allocated over the remaining performance obligations. Changes in judgments on these above estimates could impact the timing and amount of revenue recognized with a resulting impact on the timing and amount of associated income. Under these long-term government contracts, the Company may receive payments from customers based upon contractual billing schedules; accounts receivable are recorded when the right to consideration becomes unconditional. In the event a contract loss becomes known, the entire amount of the estimated loss is recognized in the Consolidated Statements of Operations.

m. Internal research and development costs

Internal research and development costs are charged to expense as incurred.

n. Precious metals

Precious metals are stated at cost and consist of various fixtures used in the high temperature crystal growth manufacturing process. From time to time the quoted market values of these precious metals may be below cost. Management evaluates these market adjustments on a recurring basis and if it is determined that they are other than temporary the carrying value would be adjusted.

o. Advertising costs

Advertising costs included in selling, general and administrative expenses were $25,000 and $19,000 for the years ended December 31, 2022 and 2021, respectively. Advertising costs are charged to expense when the related services are incurred or related events take place.

p. Concentrations and credit risk

The concentration of credit risk in the Company's accounts receivable is mitigated by the Company's credit evaluation process, familiarity with its small base of recurring customers and reasonably short collection terms and the geographical dispersion of revenue. The Company generally does not require collateral but, in some cases, the Company negotiates cash advances prior to the undertaking of the work. These cash advances are recorded as current liabilities on the balance sheet until corresponding revenues are realized.

The Company is subject to credit risk for cash accounts in a financial institution, which at times may exceed the Federal Deposit Insurance Corporation coverage limit of $250,000. The Company has not experienced losses on these accounts. The Company does not believe there is significant credit risk with respect to such cash.

The Company utilizes many relatively uncommon materials and compounds to manufacture its products and relies on outside vendors for certain manufacturing services. Therefore, any failure by its suppliers to deliver materials of an adequate quality and quantity could have an adverse effect on the Company's ability to meet the commitments of its customers.

For the year ended December 31, 2022, the Company had three customers who had sales representing 19.7%, 15.3% and 15.1% of total revenues. For the year ended December 31, 2021, the Company had three customers who had sales representing 20.3%, 13.6% and 9.5% of total revenues. Since the Company is a supplier of custom manufactured components to OEM customers, the relative size and identity of the largest customer accounts changes somewhat from year to year. In the short term, the loss of any one of these large customer accounts could have a material adverse effect on business, results of operations, and financial condition.

q. Fair value measurements

The Company follows U.S. GAAP accounting guidance which establishes a framework for measuring fair value and expanded related disclosures. The framework requires fair value to be determined based on 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.

The valuation techniques required are based upon observable and unobservable inputs. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect the Company's market assumptions. The accounting guidance requires the following fair value hierarchy:

- Level 1 - Quoted prices (unadjusted) for identical assets and liabilities in active markets that the Company has the ability to access at the measurement date.

- Level 2 - Quoted prices for similar assets and liabilities in active markets; quoted prices for identical or similar assets and liabilities in markets that are not active; and inputs other than quoted prices that are observable for the asset or liability, including interest rates, yield curves and credit risks, or inputs that are derived principally from or corroborated by observable market data through correlation.

- Level 3 - Values determined by models, significant inputs to which are unobservable and are primarily based on internally derived assumptions regarding the timing and amount of expected cash flows.

Long-lived assets may be measured at fair value if such assets are held for sale or if there is a determination that the asset is impaired. Management's determination of fair value, although highly subjective, is based on the best information available, including internal projections of future earnings and cash flows discounted at an appropriate interest rate, quoted market prices when available, market prices for similar assets, broker quotes and independent appraisals, as appropriate.

r. Recent Accounting Pronouncements

In June 2016, the FASB issued ASU 2016-13, "Financial Instruments - Credit Losses: Measurement of Credit Losses on Financial Instruments" ("ASU 2016-13") which amended guidance on the accounting for credit losses on financial instruments within its scope. The guidance introduces an expected loss model for estimating credit losses, replacing the incurred loss model. The new guidance also changes the impairment model for available-for-sale debt securities, requiring the use of an allowance to record estimated credit losses (and subsequent recoveries). The new guidance is effective for interim and annual periods beginning in 2023, with earlier application permitted. The adoption of this guidance did not have a material impact on the Company's consolidated financial statements.

In August 2020, the FASB issued ASU 2020-06, 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 ASU update is intended to simplify the complexity associated with applying generally accepted accounting principles (GAAP) for certain financial instruments with characteristics of liabilities and equity. This guidance is effective for the Company for fiscal years beginning after December 15, 2023, including interim periods within those fiscal years. The Company does not expect the adoption of this guidance will have a material impact on the Company's consolidated financial statements.

s. Subsequent events

Management has performed an evaluation of subsequent events through the date that the financial statements were issued and has determined that it does not have any additional material subsequent events to disclose in these financial statements.

2. Revenue

	Years Ended December 31,			
	2022		2021	
Market (In thousands)	**Net Sales**	**%**	**Net Sales**	**%**
Aerospace & Defense	$ 3,008	28.3	$ 3,824	33.7
Process Control & Metrology	6,981	65.6	5,656	49.8
Laser Systems	188	1.8	724	6.4
Scientific / R&D	454	4.3	1,149	10.1
Total	$ 10,631	100.0	$ 11,353	100.0

The majority of the Company's revenue is from products and services transferred to customers at a point in time and were approximately 100% and 99.6% of revenue for 2022 and 2021, respectively. The Company recognizes revenue at the point in time in which the customer obtains control of the product or service, which is generally when product title passes to the customer upon shipment. In limited cases, title does not transfer, and revenue is not recognized until the customer has received the products at its physical location.

Net sales by timing to transfers of goods and services is as follows:

	For the years ended December 31,	
	2022	2021
	(in thousands)	
Transfer at point in time	$ 10,631	$ 11,313
Transfer over time	—	40
Total net sales	$ 10,631	$ 11,353

The Company's performance obligations under long-term government contracts are generally satisfied over time. Revenue from products or services transferred to customers over time accounted for approximately 0.0% and 0.4% of revenue for 2022 and 2021, respectively.

3. Inventories, net

Inventories are comprised of the following and are shown net of inventory reserves of approximately $2.4 million and $2.5 million at December 31, 2022 and 2021, respectively:

	December 31, 2022	December 31, 2021
	(in thousands)	
Raw materials	$ 1,065	$ 1,160
Work in process, including manufactured parts and components	1,282	1,020
Finished goods	479	345
	$ 2,826	$ 2,525

4. Plant and Equipment

Plant and equipment are comprised of the following:

	December 31, 2022	December 31, 2021
	(In thousands)	
Office and computer equipment	$ 1,487	$ 1,482
Machinery and equipment	12,126	11,599
Leasehold improvements	2,354	2,312
	15,967	15,393
Less accumulated depreciation and amortization	(14,724)	(14,710)
	$ 1,244	$ 683

Depreciation and amortization expense recorded by the Company totaled approximately $249,000 and $166,000 for 2022 and 2021, respectively. Fully depreciated assets of $235,000 and $20,000 were written off in 2022 and 2021, respectively.

The Company evaluates its property and equipment for impairment when events or circumstances indicate an impairment may exist. Based on this evaluation, the Company concluded that, at December 31, 2022 and 2021, its long-lived assets were not impaired.

5. Related Party Transactions

On July 22, 2020, the maturity dates of a $1,500,000 Subordinated Convertible Promissory Note to Clarex Limited ("Clarex") and a $1,000,000 Subordinated Convertible Promissory Note to an affiliate of Clarex were each extended to April 1, 2024, from April 1, 2021. The notes bear interest at 6%. Interest accrues yearly and is payable on maturity. Unpaid interest, along with principal, may be converted into securities of the Company as follows: the notes are convertible in the aggregate into 1,500,000 units and 1,000,000 units, respectively, with each unit consisting of one share of common stock and one warrant. Each warrant allows the holder to acquire 0.75 shares of common stock at a price of $1.35 per share. As part of the agreement to extend the maturity date of the notes, the expiration dates of the warrants were extended from April 1, 2024, to April 1, 2027.

The Company paid $0.2 million for interest on the subordinated convertible promissory notes for each of the years 2022 and 2021, respectively. Accrued interest of $37,500 is included in Accounts payable and accrued liabilities as of December 31, 2022 and 2021, respectively.

6. Other Long-Term Notes

Other Long-Term Notes consist of the following:

	December 31, 2022	December 31, 2021
	(in thousands)	
U.S. Small Business Administration term note payable in equal monthly installments of $1,922 and bearing an interest rate of 4.0% and expiring in July 2029.	$ 160	$ 174
Long-term equipment financing in equal installments of $5,236 and bearing an interest rate of 6.1% and expiring in January 2027 [(1)]	225	—
Less current portion	(68)	(16)
Long-term debt, excluding current portion	$ 317	$ 158

(1) The Company purchased certain equipment in the six months ended June 30, 2022, financing approximately $282,000 at a fixed annual interest rate of 6.1% for five years payable in equal monthly installments.

Other Long-Term Notes mature as follows:

	Year ending December 31: (In thousands)
2023	$ 68
2024	71
2025	75
2026	80
2027	25
Thereafter	66
	$ 385

7. Payroll Protection Program

On May 6, 2020, the Company received loan proceeds of approximately $973,000 (the "PPP Loan"), under the Paycheck Protection Program ("PPP"). The PPP was established as part of the Coronavirus Aid, Relief and Economic Security Act ("CARES Act") which was enacted March 27, 2020. On January 19, 2021, the Company received notification from the Small Business Association that the Company's Forgiveness Application of the PPP Loan and accrued interest, totaling $980,000, was approved in full, and the Company had no further obligations related to the PPP Loan.

8. Accounts Payable and Accrued Liabilities

Accounts payable and accrued expenses are comprised of the following:

	December 31, 2022	December 31, 2021
Trade accounts payable and accrued purchases	$ 446	$ 404
Accrued payroll	25	12
Accrued 401K company matching contribution	137	126
Accrued expenses – other	133	13
	$ 741	$ 555

9. Income Taxes

The Company did not record a current provision for either state tax or federal tax due to loss carry forwards incurred for both income tax and financial reporting purposes.

A reconciliation of the income tax provision computed at the statutory federal income tax rate to our effective income tax rate follows (in percent):

	Years Ended December 31,	
	2022	2021
Federal statutory rate	21 %	21 %
Reduction in state rate due to tax rate change	9	9
Change in Valuation Allowance	(106)	(14)
Permanent Differences	33	(15)
Return to provision adjustment	43	(1)
Effective income tax rate	— %	— %

At December 31, 2022 and 2021, the Company had estimated Federal net operating loss carry forwards of approximately $10.1 million and $9.5 million, respectively, and state net operating loss carry forwards of approximately $5.0 million and $4.5 million, respectively. Approximately $8.2 million net operating loss carryforwards expire during various years through 2037, and approximately $1.9 million may be carried forward indefinitely, subject to the 80% of taxable income limitation rule.

Internal Revenue Code Section 382 places a limitation on the utilization of Federal net operating loss and other credit carry forwards when an ownership change, as defined by the tax law, occurs. Generally, this occurs when a greater than 50 percentage point change in ownership occurs. Accordingly, the actual utilization of the net operating loss and carryforwards for tax purposes may be limited annually to a percentage (based on the risk-free interest rate) of the fair market value of the Company at the time of any such ownership change. The Company has not prepared an analysis of ownership changes but does not believe that a greater than 50% change of ownership has occurred and such limitations would not apply to the Company.

Deferred tax assets (liabilities) are comprised of the following:

	Years Ended December 31,	
	2022	2021
Account receivable reserves	$ 13	$ 25
Inventory reserves	667	707
Inventory capitalization	92	71
Depreciation	—	197
Loss carry forwards	2,562	2,386
Gross deferred tax assets	3,334	3,386
Deferred tax liability- depreciation	(110)	—
Valuation allowance	(3,224)	(3,386)
Net deferred tax asset	$ —	$ —

In evaluating the Company's ability to recover deferred tax assets in future periods, management considers the available positive and negative factors, including the Company's recent operating results, the existence of cumulative losses and near-term forecasts of future taxable income that is consistent with the plans and estimates management is using to manage the underlying business. A significant piece of objective evidence evaluated was the cumulative loss incurred by the Company over the three-year period ended December 31, 2022.

On the basis of this evaluation, as of December 31, 2022, the valuation allowance decreased by $162,000 due to the reduction of net operating loss carryforwards. The valuation allowance increased as of December 31, 2021, by $61,000. The company concluded it was more likely than not that it would not be able to realize a significant portion of the benefit on the deferred tax assets and adjusted the valuation allowance accordingly.

The Company files income tax returns in the United States, which typically provides for a three-year statute of limitations on assessments. The Company is no longer subject to federal, state, or local income tax examinations by tax authorities for the years before 2019.

The guidance for accounting for uncertainties in income taxes requires that we recognize the financial statement effects of a tax position when it is more likely than not, based on the technical merits, that the position will be sustained upon examination. There were no unrecognized tax benefits that impacted our effective tax rate and accordingly, there was no material effect to our financial position, results of operations or cash flows.

Our policy is to recognize interest and penalties related to the underpayment of income taxes as a component of income tax expense. To date, there have been no interest or penalties charged to us in relation to the underpayment of income taxes.

We do not anticipate that our unrecognized tax benefits will significantly increase in the next 12 months.

10. Equity Compensation Program and Stock-based Compensation

a. 2020 Equity Compensation Program

On February 12, 2020, the Inrad Optics Board of Directors, adopted the Inrad Optics, Inc. 2020 Equity Compensation Program (the "2020 Program"), and received shareholder approval on June 23, 2020. The 2020 Program provides for grants of options, stock appreciation rights and restricted stock awards to employees, officers, directors, and others who render services to the Company. The 2020 Program is comprised of four parts including: (i) the Incentive Stock Option Plan which provides for grants of "incentive stock options," (ii) the Supplemental Stock Option Plan which provides for grants of stock options that shall not be "incentive stock options," (iii) the Stock Appreciation Rights Plan which allows the granting of stock appreciation rights and, (iv) the Restricted Stock Award Plan which provides for the granting of restrictive shares of Common Stock and restricted stock units. The 2020 Program is administered by the Compensation Committee of the Board of Directors. Under the 2020 Program, an aggregate of up to 4,000,000 shares of common stock may be granted.

b. 2010 Equity Compensation Program

The Company's 2010 Equity Compensation Program (the "2010 Program") provided for grants of options, stock appreciation rights and restricted stock awards to employees, officers, directors, and others who render services to the Company. The 2010 Program expired on March 23, 2020. All outstanding grants of options, stock appreciation rights and performance shares issued under the 2010 Program will remain outstanding and shall expire on the date determined by the terms of the original grant. The latest date of expiration for outstanding grants under the 2010 Program is March 23, 2030.

c. Stock Option Expense

The Company's results include stock-based compensation expense for stock option grants totaling $116,000 and $113,000 for the years ended December 31, 2022 and 2021, respectively. Such amounts have been included in the Consolidated Statements of Operations within cost of goods sold ($13,000 and $21,000 for 2022 and 2021, respectively), and selling, general and administrative expenses ($103,000 and $92,000 for 2022 and 2021, respectively).

As of December 31, 2022 and 2021, there were $222,000 and $120,000 of unrecognized compensation costs, net of estimated forfeitures, related to non-vested stock options, which are expected to be recognized over a weighted average period of approximately 1.54 and 1.57 years, respectively.

The weighted average estimated fair value of stock options granted in the two years ended December 31, 2022 and 2021, was $1.20 and $0.62, respectively. The Company uses the Black-Scholes option pricing model to calculate the grant-date fair value of an option award. The Company assumes a dividend yield of zero, as the Company has not paid dividends in the past and does not expect to in the foreseeable future. The expected volatility is based upon the historical volatility of our common stock which the Company believes results in the best estimate of the grant-date fair value of employee stock options because it reflects the market's current expectations of future volatility. The risk-free rate is based on the U.S. Treasury yield curve in effect at the time of the grant with maturity dates approximately equal to the expected life at the grant date. The expected life is based upon the period of expected benefit based on the Company's evaluation of historical and expected future employee exercise behavior.

The following range of weighted-average assumptions were used for to determine the fair value of stock option grants during the years ended December 31, 2022 and 2021:

	Years Ended December 31, 2022	Years Ended December 31, 2021
Expected dividend yield	— %	— %
Expected volatility	104.62 %	106.35 %
Risk-free interest rate	1.54 %	0.86 %
Expected term	10 years	10 years

d. Stock Option Activity

A summary of the Company's outstanding stock options as of and for the years ended December 31, 2022 and 2021, is presented below:

Stock Options	**Number of Options**	**Weighted Average Exercise Price per Option**	**Weighted Average Remaining Contractual Term (years)**	**Aggregate Intrinsic Value(a)**
Outstanding January 1, 2021	1,150,867	$ 0.64	6.61	$ 107,573
Granted	200,000	0.62		
Exercised	—	—		
Expired/Forfeited	(198,200)	0.86		
Outstanding December 31, 2021 (b)	1,152,667	$ 0.60	7.40	$ 662,465
Granted	200,000	1.20		
Exercised	(66,000)	0.38		
Expired/Forfeited	—	—		
Outstanding December 31, 2022 (b)	1,286,667	$ 0.71	7.52	$ 1,214,875
Exercisable at December 31, 2022	945,832	$ 0.61	6.13	$ 1,085,699

(a) Intrinsic value for purposes of this table represents the amount by which the fair value of the underlying stock, based on the respective market prices as of December 31, 2022, exceeds the exercise prices of the respective options.

(b) Based on the Company's historical forfeiture rate, the number of options expected to vest is the same as the total outstanding at December 31, 2022.

The following table represents non-vested stock options granted, vested, and forfeited for the year ended December 31, 2022:

	Options	**Weighted-average Grant-date Fair Value ($)**
Non-Vested - January 1, 2022	276,670	0.66
Granted	200,000	1.09
Vested	(135,836)	0.70
Forfeited	—	—
Non-Vested – December 31, 2022	340,834	0.89

The total weighted average grant date fair value of options vested during the years ended December 31, 2022 and 2021, was $218,000 and $113,000, respectively.

The following table summarizes information about stock options outstanding at December 31, 2022:

Range of Exercise Price	Options Outstanding: Number Outstanding	Options Outstanding: Weighted Average Remaining Contractual Life in Years	Options Outstanding: Weighted Average Exercise Price	Options Exercisable: Number Outstanding	Options Exercisable: Weighted Average Exercise Price
$0.18 - $0.35	346,667	3.19	$ 0.30	346,667	$ 0.30
$0.50 - $1.00	702,500	7.10	$ 0.72	569,165	$ 0.74
$1.40 - $1.80	237,500	9.74	$ 1.26	30,000	$ 1.64

11. Net (Loss) Income per Share

Basic income (loss) per common share is computed by dividing net income (loss) by the weighted average number of common shares outstanding. Diluted income (loss) per common share is computed by dividing net income (loss) by the weighted average number of common shares and common stock equivalents outstanding, calculated on the treasury stock method for options, stock grants and warrants using the average market prices during the period, including potential common shares issuable upon conversion of outstanding convertible notes, except if the effect on the per share amounts is anti-dilutive.

For the year ended December 31, 2022, a total of 2,500,000 common shares issuable upon conversion of outstanding convertible notes and 1,875,000 common shares underlying warrants issuable upon conversion of outstanding related party convertible notes have been excluded from the diluted computation of net income per share because their effect is anti-dilutive. A total of 706,668 common stock equivalents related to outstanding options have been included in the computation of diluted earnings per share because their effect is dilutive. 30,000 common stock equivalents related to outstanding stock options have been excluded from the computation of diluted earnings per share because their effect is anti-dilutive.

For the year ended December 31, 2021, a total of 2,500,000 common shares issuable upon conversion of outstanding convertible notes have been included in the diluted calculation. 1,875,000 common shares underlying warrants issuable upon conversion of outstanding related party convertible notes have been excluded from the diluted computation of net income per share because their effect is anti-dilutive. A total of 258,819 common stock equivalents related to outstanding options have been included in the computation of diluted earnings per share because their effect is dilutive. 37,500 common stock equivalents related to outstanding stock options have been excluded from the computation of diluted earnings per share because their effect is anti-dilutive.

12. Commitments and Contingencies

a. Lease commitments

Lease expense is recognized on a straight-line basis over the lease term and is included in cost of sales and general and administrative expenses on the consolidated statement of operations.

An initial right-of-use asset of approximately $0.9 million was recognized as a non-cash asset addition with the signing of the July 25, 2022, lease amendment. Cash paid for amounts included in the present value of the operating lease liability was $0.2 million during the year ended December 31, 2022, and is included in operating cash flows.

The following table presents information about the amount and timing of cash flows arising from the Company's operating and capital leases as of December 31, 2022:

Maturity of Lease Liability	**(in thousands)**
2023	$ 328
2024	325
2025	135
Total undiscounted operating and capital lease payments	788
Less: imputed interest	(48)
Present value of lease liabilities	$ 740
Other Information	
Remaining lease term (in months)	
Opeating lease	29
Capital lease	2
Discount rate for operating lease	5.80 %
Discount rate for capital lease	3.99 %

The Company's total rent expense for the years ended December 31, 2022 and 2021, was $0.3 million in each year.

The Company also paid real estate taxes and insurance premiums under the terms of the lease that totaled approximately $0.1 million in both 2022 and 2021.

b. Retirement plans

The Company maintains a 401(k) savings plan (the "Plan") for all eligible employees (as defined in the plan). The 401(k) Plan allows employees to contribute up to 70% of their compensation on a salary reduction, pre-tax basis up to the statutory limitation. The 401(k) Plan also provides that the Company, at the discretion of the Board of Directors, may match employee contributions based on a pre-determined formula.

In 2022, the Company's 401(k) matching contribution for employees was $137,000. This will be funded by way of a contribution of cash of $82,000 and 83,306 shares of the Company's common stock, which will be issued to the Plan in February 2023. In 2021, the Company's 401(k) matching contribution for employees was $127,000. This was funded by way of a contribution of cash of $76,000 and 149,156 shares of the Company's common stock, which were issued to the Plan in June 2022. The Company records the distribution of the common shares in the Consolidated Statement of Shareholders' Equity as of the date of distribution to the 401(k) Plan administrator.

13. Product Sales, Foreign Sales, and Sales to Major Customers

The Company's export sales, which are primarily to customers in countries within Europe, Israel, Asia, and Japan, amounted to approximately 37.7% and 36.6% of product sales in 2022 and 2021, respectively.

The Company had sales to three major customers which accounting for approximately 50.1% of sales in 2022. One customer, a capital equipment company supplies process and control and yield management systems for the semiconductor industry, accounted for 19.7% of sales in 2022. The two other customers included a foreign-based manufacturer of process control and metrology equipment and a U.S.-based customer in the aerospace defense industry whose sales represented 15.3% and 15.1% of sales, respectively. For 2021, the top three customers represented 20.3%, 13.6% and 9.5% of sales.

During the past two years, sales to the Company's top five customers represented approximately 68.6% and 53.9%, respectively. Given the concentration of sales within a small number of customers, the loss of any of these customers would have a significant negative impact on the Company and its business units.

14. Shareholders' Equity

a. Common shares reserved for future issuances at December 31, 2022, are as follows:

2020 Equity compensation plan	3,600,000
2010 Equity compensation plan	886,667
Subordinated convertible notes	2,500,000
Warrants issuable on conversion of Subordinated convertible notes	1,875,000
	8,861,667

b. Warrants

The Company had no outstanding warrants as of December 31, 2022 and 2021.

15. Fair Value of Financial Instruments

The methods and assumptions used to estimate the fair value of the following classes of financial instruments were:

Current Assets and Current Liabilities: The carrying amount of cash, current receivables and payables and certain other short-term financial instruments approximate their fair value as of December 31, 2022, due to their short-term maturities.

Long-Term Debt: The fair value of the Company's long-term debt, including the current portion, for notes payable and subordinated convertible debentures, was estimated using a discounted cash flow analysis, based on the Company's assumed incremental borrowing rates for similar types of borrowing arrangements. The fair value of long-term debt is estimated to be $2.6 million compared to its carrying amount of $2.8 million as of December 31, 2022.

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (See File No. 333-17883, effective December 31, 1996, File No. 333-119664, effective October 12, 2004, and File No. 333-167679, effective June 22, 2010) of our report dated March 30, 2022, with respect to the consolidated financial statements of Inrad Optics, Inc. and Subsidiaries included in this Annual Report on Form 10-K for the year ended December 31, 2022.

/s/ PKF O'Connor Davies, LLP

March 30, 2023
New York, NY

Exhibit 31.1

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

I, Amy Eskilson, certify that:

1. I have reviewed this Annual Report on Form 10-K for the year ended December 31, 2022, of Inrad Optics, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated Subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 30, 2023

/s/ Amy Eskilson
Amy Eskilson
Chief Executive Officer

A signed original of this written statement required by Sections 302 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission, or its staff, upon request.

Exhibit 31.2

CERTIFICATION PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Theresa A. Balog, certify that:

1. I have reviewed this Annual Report on Form 10-K for the year ended December 31, 2022, of Inrad Optics, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated Subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 30, 2023

/s/ Theresa A. Balog
Theresa A. Balog
Chief Financial Officer, Secretary and Treasurer

A signed original of this written statement required by Sections 302 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission, or its staff, upon request.

Exhibit 32.1

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

In connection with the annual report of Inrad Optics, Inc. (the "Company") on Form 10-K for the year ended December 31, 2022, filed with the Securities and Exchange Commission (the "Report"), I, Amy Eskilson, Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of Section 13(a) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the consolidated financial condition of the Company as of the dates presented and consolidated results of operations of the Company for the periods presented.

Dated: March 30, 2023

/s/ Amy Eskilson
Amy Eskilson
Chief Executive Officer

This certification has been furnished solely pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.

A signed original of this written statement required by Sections 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission, or its staff, upon request.

Exhibit 32.2

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

In connection with the annual report of Inrad Optics, Inc. (the "Company") on Form 10-K for the year ended December 31, 2022, filed with the Securities and Exchange Commission (the "Report"), I, Theresa A. Balog, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of Section 13(a) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the consolidated financial condition of the Company as of the dates presented and consolidated results of operations of the Company for the periods presented.

Dated: March 30, 2023

/s/ Theresa A. Balog
Theresa A. Balog
Chief Financial Officer, Secretary and Treasurer

This certification has been furnished solely pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.

A signed original of this written statement required by Sections 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission, or its staff, upon request.

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Corporate Directory

Board of Directors

Jan M. Winston
Chairman of the Board

William J. Foote
Director

Luke P. LaValle, Jr.
Director

Dennis G. Romano
Director

N.E. Rick Strandlund
Director

Amy Eskilson
President and Chief Executive Officer

Corporate Officers

Amy Eskilson
President and Chief Executive Officer

Theresa A. Balog
Chief Financial Officer, Secretary and Treasurer

George F. Murray
Vice President, Sales and Marketing

Independent Registered Public Accountants

PKF O'Connor Davies, LLP
245 Park Avenue
New York, New York 10167

General Counsel

Lowenstein, Sandler PC
65 Livingston Ave.
Roseland, New Jersey 07068

Registrar and Transfer Agent

American Stock Transfer & Trust Company
6201 15th Avenue
Brooklyn, New York, 11219

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