UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-Q

(Mark One)

☒ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the quarterly period ended March 31, 2021

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the transition period from to .
Commission File Number 001-33155

IPG PHOTONICS CORPORATION
(Exact name of registrant as specified in its charter)

Delaware	**04-3444218**
(State or other jurisdiction of incorporation or organization)	*(I.R.S. Employer Identification Number)*
50 Old Webster Road, Oxford, Massachusetts	**01540**
(Address of principal executive offices)	*(Zip code)*

Registrant's telephone number, including area code: **(508) 373-1100**

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

Title of each class	Trading Symbol	Name of each exchange on which registered
Common Stock, par value $0.0001 per share	**IPGP**	**The Nasdaq Stock Market LLC**

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data file required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

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

Large Accelerated Filer	☑	Accelerated Filer	☐
Non-Accelerated Filer	☐	Smaller Reporting Company	☐
Emerging Growth Company	☐		

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

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

As of May 4, 2021, there were 53,578,610 shares of the registrant's common stock outstanding.

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PART I—FINANCIAL INFORMATION

ITEM 1. UNAUDITED INTERIM FINANCIAL STATEMENTS

IPG PHOTONICS CORPORATION
CONDENSED CONSOLIDATED BALANCE SHEETS

	March 31, 2021	December 31, 2020
	(In thousands, except share and per share data)	
ASSETS		
Current assets:		
Cash and cash equivalents	$ 896,741	$ 876,231
Short-term investments	548,196	514,835
Accounts receivable, net	252,877	264,321
Inventories	368,149	364,993
Prepaid income taxes	70,421	69,893
Prepaid expenses and other current assets	65,877	57,804
Total current assets	2,202,261	2,148,077
Deferred income taxes, net	41,276	43,197
Goodwill	38,764	41,366
Intangible assets, net	61,768	62,114
Property, plant and equipment, net	600,911	597,527
Other assets	37,971	43,419
Total assets	$ 2,982,951	$ 2,935,700
LIABILITIES AND EQUITY		
Current liabilities:		
Current portion of long-term debt	$ 3,828	$ 3,810
Accounts payable	44,704	25,748
Accrued expenses and other current liabilities	162,775	176,740
Income taxes payable	3,446	8,280
Total current liabilities	214,753	214,578
Deferred income taxes and other long-term liabilities	94,335	92,854
Long-term debt, net of current portion	33,193	34,157
Total liabilities	342,281	341,589
Commitments and contingencies (Note 12)		
IPG Photonics Corporation equity:		
Common stock, $0.0001 par value, 175,000,000 shares authorized; 55,672,783 and 53,623,865 shares issued and outstanding, respectively, at March 31, 2021; 55,461,246 and 53,427,234 shares issued and outstanding, respectively, at December 31, 2020.	6	6
Treasury stock, at cost, 2,048,918 and 2,034,012 shares held at March 31, 2021 and December 31, 2020, respectively.	(306,662)	(303,614)
Additional paid-in capital	868,097	854,301
Retained earnings	2,256,318	2,188,191
Accumulated other comprehensive loss	(178,257)	(146,065)
Total IPG Photonics Corporation equity	2,639,502	2,592,819
Non-controlling interests	1,168	1,292
Total equity	2,640,670	2,594,111
Total liabilities and equity	$ 2,982,951	$ 2,935,700

See notes to condensed consolidated financial statements.

IPG PHOTONICS CORPORATION
CONDENSED CONSOLIDATED STATEMENTS OF INCOME

	Three Months Ended March 31,	
	2021	2020
	(In thousands, except per share data)	
Net sales	$ 345,585	$ 249,242
Cost of sales	181,594	146,366
Gross profit	163,991	102,876
Operating expenses:		
Sales and marketing	18,883	18,683
Research and development	33,339	31,838
General and administrative	30,092	27,124
(Gain) on foreign exchange	(7,165)	(19,565)
Total operating expenses	75,149	58,080
Operating income	88,842	44,796
Other (expense) income, net:		
Interest (expense) income, net	(495)	3,073
Other income, net	253	191
Total other (expense) income	(242)	3,264
Income before provision for income taxes	88,600	48,060
Provision for income taxes	20,378	11,294
Net income	68,222	36,766
Less: net income attributable to non-controlling interests	95	363
Net income attributable to IPG Photonics Corporation common stockholders	$ 68,127	$ 36,403
Net income attributable to IPG Photonics Corporation per common share:		
Basic	$ 1.27	$ 0.69
Diluted	$ 1.26	$ 0.68
Weighted average common shares outstanding:		
Basic	53,541	53,075
Diluted	54,201	53,676

See notes to condensed consolidated financial statements.

IPG PHOTONICS CORPORATION
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

	Three Months Ended March 31,	
	2021	2020
	(In thousands)	
Net income	$ 68,222	$ 36,766
Other comprehensive income, net of tax:		
Translation adjustments	(32,479)	(73,417)
Unrealized gain on derivatives	68	36
Total other comprehensive (loss)	(32,411)	(73,381)
Comprehensive income (loss)	35,811	(36,615)
Less: comprehensive (loss) income attributable to non-controlling interests	(124)	144
Comprehensive income (loss) attributable to IPG Photonics Corporation	$ 35,935	$ (36,759)

See notes to condensed consolidated financial statements.

IPG PHOTONICS CORPORATION
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS

	Three Months Ended March 31, 2021	Three Months Ended March 31, 2020
	(In thousands)	
Cash flows from operating activities:		
Net income	$ 68,222	$ 36,766
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	23,819	24,099
Deferred income taxes	3,944	(935)
Stock-based compensation	8,815	8,430
Unrealized gain on foreign currency transactions	(7,800)	(19,589)
Other	1,462	1,015
Provisions for inventory, warranty and bad debt	16,685	13,486
Changes in assets and liabilities that provided (used) cash, net of acquisitions:		
Accounts receivable	7,360	34,492
Inventories	(20,084)	(10,429)
Prepaid expenses and other assets	(1,052)	(9,119)
Accounts payable	18,980	6,054
Accrued expenses and other liabilities	(17,961)	(6,477)
Income and other taxes payable	(14,847)	(21,012)
Net cash provided by operating activities	87,543	56,781
Cash flows from investing activities:		
Purchases of and deposits on property, plant and equipment	(27,421)	(17,801)
Proceeds from sales of property, plant and equipment	130	139
Purchases of short-term investments	(513,564)	(308,195)
Proceeds from short-term investments	480,163	186,024
Other	(2)	79
Net cash used in investing activities	(60,694)	(139,754)
Cash flows from financing activities:		
Principal payments on long-term borrowings	(946)	(928)
Proceeds from issuance of common stock under employee stock option and purchase plans less payments for taxes related to net share settlement of equity awards	4,981	(5,498)
Purchase of treasury stock, at cost	(3,048)	(12,716)
Payment of purchase price holdback from business combination	(2,624)	(1,650)
Net cash used in financing activities	(1,637)	(20,792)
Effect of changes in exchange rates on cash, cash equivalents and restricted cash	(7,024)	(6,878)
Net increase in cash, cash equivalents and restricted cash	18,188	(110,643)
Cash, cash equivalents and restricted cash — Beginning of period	878,553	682,984
Cash and cash equivalents — End of period	$ 896,741	$ 572,341
Supplemental disclosure of cash flow information:		
Cash paid for interest	$ 703	$ 447
Cash paid for income taxes	$ 21,340	$ 29,865
Non-cash transactions:		
Demonstration units transferred from inventory to other assets	$ 1,109	$ 1,086
Inventory transferred to machinery and equipment	$ 727	$ 1,294
Changes in accounts payable related to property, plant and equipment	$ 863	$ 6,983
Leased assets obtained in exchange for new operating lease liabilities	$ 409	$ 830

See Note 4 for reconciliation of cash, cash equivalents and restricted cash between the condensed consolidated balance sheets and condensed consolidated statements of cash flows.

See notes to condensed consolidated financial statements.

IPG PHOTONICS CORPORATION
CONDENSED CONSOLIDATED STATEMENTS OF EQUITY

	Three Months Ended March 31,								
	Common Stock		Treasury Stock		Additional Paid-In Capital	Retained Earnings	Accumulated Other Comprehensive (Loss) Income	Non-controlling Interest	Total Stockholders' Equity
(In thousands, except share data)	Shares	Amount	Shares	Amount					
Balance, January 1, 2021	**53,427,234**	**$ 6**	**(2,034,012)**	**$ (303,614)**	**$ 854,301**	**$ 2,188,191**	**$ (146,065)**	**$ 1,292**	**$ 2,594,111**
Exercise of stock options and vesting of RSUs and PSUs	211,537	—	—	—	4,981	—	—	—	4,981
Purchased common stock	(14,906)	—	(14,906)	(3,048)	—	—	—	—	(3,048)
Stock-based compensation	—	—	—	—	8,815	—	—	—	8,815
Net income	—	—	—	—	—	68,127	—	95	68,222
Foreign currency translation adjustments	—	—	—	—	—	—	(32,260)	(219)	(32,479)
Unrealized gain on derivatives, net of tax	—	—	—	—	—	—	68	—	68
Balance, March 31, 2021	**53,623,865**	**$ 6**	**(2,048,918)**	**$ (306,662)**	**$ 868,097**	**$ 2,256,318**	**$ (178,257)**	**$ 1,168**	**$ 2,640,670**
Balance, January 1, 2020	**53,010,875**	**$ 5**	**(1,732,352)**	**$ (265,730)**	**$ 785,636**	**$ 2,028,734**	**$ (146,919)**	**$ 717**	**$ 2,402,443**
Exercise of stock options and vesting of RSUs and PSUs	225,125	1	—	—	(5,498)	—	—	—	(5,497)
Purchased common stock	(108,819)	—	(108,819)	(12,716)	—	—	—	—	(12,716)
Stock-based compensation	—	—	—	—	8,430	—	—	—	8,430
Recently adopted accounting standards	—	—	—	—	—	(115)	—	—	(115)
Net income	—	—	—	—	—	36,403	—	363	36,766
Foreign currency translation adjustments	—	—	—	—	—	—	(73,198)	(219)	(73,417)
Unrealized gain on derivatives, net of tax	—	—	—	—	—	—	36	—	36
Balance, March 31, 2020	**53,127,181**	**$ 6**	**(1,841,171)**	**$ (278,446)**	**$ 788,568**	**$ 2,065,022**	**$ (220,081)**	**$ 861**	**$ 2,355,930**

See notes to condensed consolidated financial statements.

IPG PHOTONICS CORPORATION
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(In thousands, except share and per share data)

1. BASIS OF PRESENTATION AND SIGNIFICANT ACCOUNTING POLICIES

Basis of Presentation — The accompanying unaudited condensed consolidated financial statements have been prepared by IPG Photonics Corporation, or "IPG", "its" or the "Company". Certain information and footnote disclosures normally included in financial statements prepared in accordance with accounting principles generally accepted in the United States of America have been condensed or omitted pursuant to the rules and regulations of the Securities and Exchange Commission ("SEC"). The condensed consolidated financial statements include the Company's accounts and those of its subsidiaries. All intercompany balances have been eliminated in consolidation. These condensed consolidated financial statements should be read in conjunction with the consolidated financial statements and notes thereto in the Company's Annual Report on Form 10-K for the year ended December 31, 2020.

In the opinion of the Company's management, the financial information for the interim periods presented reflects all adjustments necessary for a fair presentation of the Company's financial position, results of operations and cash flows. The results reported in these condensed consolidated financial statements are not necessarily indicative of results that may be expected for the entire year.

Accounts Receivable and Allowance for Doubtful Accounts — The Company maintains an allowance for doubtful accounts to provide for the estimated amount of accounts receivable that will not be collected. The allowance is based upon an estimate of expected credit losses over the life of outstanding receivables. The estimate involves an assessment of customer creditworthiness, historical payment experience, an assumption of future expected credit losses, and the age of outstanding receivables.

Activity related to the allowance for doubtful accounts was as follows:

	Three Months Ended March 31,	
	2021	**2020**
Balance, beginning of period	$ 2,156	$ 2,547
Provision for bad debts, net of recoveries	188	(187)
Foreign currency translation	(37)	(225)
Balance, end of period	$ 2,307	$ 2,135

Subsequent Events — The Company has considered the impact of subsequent events through the filing date of these financial statements. There were no events through the filing date of these financial statements required to be disclosed.

2. RECENT ACCOUNTING PRONOUNCEMENTS

Adopted Pronouncements —

In December 2019, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2019-12, "Simplifying the Accounting for Income Taxes" ("ASU 2019-12"), which modifies ASC 740 to simplify the accounting for income taxes. The Company adopted ASU 2019-12 as of January 1, 2021. The impact from adopting this standard was immaterial.

In June 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2016-13, "Measurement of Credit Losses on Financial Instruments" ("ASU 2016-13"), which adds an impairment model (known as the current expected credit loss ("CECL") model) that is based on expected losses rather than incurred losses. Under the new guidance, an entity recognizes as an allowance for its estimate of expected credit losses, which the FASB believes will result in more timely recognition of such losses. The ASU is also intended to reduce the complexity by decreasing the number of credit impairment models that entities use to account for debt instruments. The Company adopted ASU 2016-03, along with its subsequent clarifications, as of January 1, 2020. The cumulative effect of the changes made to the Company's condensed consolidated January 1, 2020 balance sheet for the adoption of ASU 2016-13 was as follows:

(In thousands, except share and per share data)

	Balance at December 31, 2019	Adoption of ASU 2016-13	Balance at January 1, 2020
Balance Sheet			
Accounts receivable, net	$ 238,479	$ (148)	$ 238,331
Deferred income taxes, net	31,395	33	31,428
Retained earnings	2,028,734	(115)	2,028,619

Other Pronouncements Currently Under Evaluation —

In March 2020, the FASB issued ASU No. 2020-04, "Reference Rate Reform (Topic 848)" ("ASU 2020-04"), which offers optional expedients related to contracts, hedging relationships, and other transactions that reference LIBOR or another reference rate expected to be discontinued because of reference rate reform. ASU 2020-04, along with its subsequent clarifications, is effective from March 12, 2020 through December 31, 2022. The Company is currently evaluating the standard but does not expect that it will have a material effect on its condensed consolidated financial statements, if adopted.

3. REVENUE FROM CONTRACTS WITH CUSTOMERS

Sales are derived from products for different applications: fiber lasers, diode lasers, systems and accessories for materials processing; fiber lasers, diodes and amplifiers for advanced applications; fiber amplifiers and transceivers for communications applications; and fiber lasers, systems and fibers for medical applications.

The following tables represent a disaggregation of revenue from contracts with customers:

	Three Months Ended March 31,	
	2021	2020
Sales by Application		
Materials processing	$ 317,241	$ 218,074
Other applications	28,344	31,168
Total	$ 345,585	$ 249,242
Sales by Product		
High Power Continuous Wave ("CW") Lasers	$ 170,482	$ 119,316
Medium Power CW Lasers	15,882	11,253
Pulsed Lasers	55,395	31,839
Quasi-Continuous Wave ("QCW") Lasers	13,666	9,873
Laser and Non-Laser Systems	27,116	18,634
Other Revenue including Amplifiers, Service, Parts, Accessories and Change in Deferred Revenue	63,044	58,327
Total	$ 345,585	$ 249,242

(In thousands, except share and per share data)

	Three Months Ended March 31,	
	2021	2020
Sales by Geography		
North America	$ 73,384	$ 67,339
Europe:		
Germany	26,260	17,411
Other including Eastern Europe/CIS	58,593	57,232
Asia and Australia:		
China	139,833	68,599
Japan	10,877	13,685
Other	33,110	22,823
Rest of World	3,528	2,153
Total	$ 345,585	$ 249,242
Timing of Revenue Recognition		
Goods and services transferred at a point in time	$ 332,532	$ 233,436
Goods and services transferred over time	13,053	15,806
Total	$ 345,585	$ 249,242

One of the Company's customers accounted for 22% and 21% of the Company's net accounts receivable as of March 31, 2021 and December 31, 2020, respectively.

The Company enters into contracts to sell lasers and spare parts, for which revenue is generally recognized upon shipment or delivery, depending on the terms of the contract. The Company also provides installation services and extended warranties. The Company frequently receives consideration from a customer prior to transferring goods to the customer under the terms of a sales contract. The Company records customer deposits related to these prepayments, which represent a contract liability. The Company also records deferred revenue related to installation services when consideration is received before the services have been performed. The standalone selling price for installation services is determined based on the estimated number of days of service technician time required for installation at standard service rates. The Company recognizes customer deposits and deferred revenue as net sales after control of the goods or services has been transferred to the customer and all revenue recognition criteria are met. The Company bills customers for extended warranties upon entering into the agreement with the customer, resulting in deferred revenue. The Company recognizes revenue over time on contracts for the sale of robotics systems. The timing of customer payments on these contracts generally differs from the timing of revenue recognized. If revenue recognized exceeds customer payments, a contract asset is recorded and if customer payments exceed revenue recognized, a contract liability is recorded. Contract assets are included within prepaid expense and other current assets on the condensed consolidated balance sheets. Contract liabilities are included within accrued expenses and other current liabilities on the condensed consolidated balance sheets. Certain deferred revenues related to extended warranties in excess one year from the balance sheet date are included within deferred income taxes and other long-term liabilities on the condensed consolidated balance sheets.

The following table reflects the changes in the Company's contract assets and liabilities for the three months ended March 31, 2021 and 2020:

	March 31, 2021	December 31, 2020	Change	March 31, 2020	December 31, 2019	Change
Contract assets						
Contract assets	$ 7,670	$ 8,999	$ (1,329)	$ 8,646	$ 9,645	$ (999)
Contract liabilities						
Contract liabilities - current	69,526	71,246	(1,720)	62,499	59,531	2,968
Contract liabilities - long-term	2,549	2,189	360	2,377	1,820	557

During the three months ended March 31, 2021 and 2020 the Company recognized revenue of $30,378 and $14,995, respectively, that was included in contract liabilities at the beginning of each period.

(In thousands, except share and per share data)

The Company has elected the practical expedient in ASC 606-10-50-14, whereby the performance obligations for contracts with an original expected duration of one year or less are not disclosed. The following table represents the Company's remaining performance obligations from contracts that are recognized over time as of March 31, 2021:

	Remaining Performance Obligations						
	2021 [(a)]	2022	2023	2024	2025	Thereafter	Total
Revenue expected to be recognized for extended warranty agreements	$ 3,385	$ 1,493	$ 842	$ 589	$ 263	$ 27	$ 6,599
Revenue to be earned over time from contracts to sell robotic systems	15,350	1,405	—	—	—	—	16,755
Total	$ 18,735	$ 2,898	$ 842	$ 589	$ 263	$ 27	$ 23,354

[(a)] For the nine-month period beginning April 1, 2021.

4. RESTRICTED CASH

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within the condensed consolidated balance sheets to the total of the same amounts shown in the condensed consolidated statements of cash flows.

	March 31,		December 31,	
	2021	2020	2020	2019
Cash and cash equivalents	$ 896,741	$ 570,058	$ 876,231	$ 680,070
Restricted cash included in prepaid expenses and other current assets	—	2,283	2,322	—
Restricted cash included in other assets	—	—	—	2,914
Cash, cash equivalents and restricted cash in the condensed consolidated statements of cash flows	$ 896,741	$ 572,341	$ 878,553	$ 682,984

During the first quarter of 2021, the Company released $2,127 of restricted cash held back related to the Company's acquisition of the submarine networks division (SND) of Padtec SA, for indemnities provided by the seller.

5. FAIR VALUE MEASUREMENTS

The Company's financial instruments consist of cash equivalents, short-term investments, accounts receivable, accounts payable, drawings on revolving lines of credit, long-term debt, interest rate swaps and contingent purchase consideration.

The valuation techniques used to measure fair value are based upon observable and unobservable inputs. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect internal market assumptions. These two types of inputs create the following fair value hierarchy: Level 1, defined as observable inputs such as quoted prices for identical instruments in active markets; Level 2, defined as inputs other than quoted prices in active markets that are either directly or indirectly observable; and Level 3, defined as unobservable inputs for which little or no market data exists, therefore requiring an entity to develop its own assumptions. The Company classifies its financial instruments according to the prescribed criteria.

IPG PHOTONICS CORPORATION
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS - (Continued)
(In thousands, except share and per share data)

The following table presents fair value information related to the Company's assets and liabilities measured at amortized cost on the condensed consolidated balance sheets with the exception of the interest rate swap and contingent purchase consideration, which is measured at fair value:

	Fair Value Measurements at March 31, 2021			
	Total	Level 1	Level 2	Level 3
Assets				
Cash equivalents:				
Money market fund deposits and term deposits	$ 306,431	$ 306,431	$ —	$ —
Commercial paper	173,324	—	173,324	—
Municipal bonds	7,998	—	7,998	—
Corporate bonds	47,703	—	47,703	—
Short-term investments:				
Corporate bonds	56,323	—	56,323	—
Commercial paper	475,818	—	475,818	—
Certificates of deposit	3,000	3,000	—	—
U.S. Treasury and agency obligations	13,000	—	13,000	—
Total	$ 1,083,597	$ 309,431	$ 774,166	$ —
Liabilities				
Long-term debt	$ 37,296	$ —	$ 37,296	$ —
Interest rate swap	514		514	
Contingent purchase consideration	1,343	—	—	1,343
Total	$ 39,153	$ —	$ 37,810	$ 1,343

	Fair Value Measurements at December 31, 2020			
	Total	Level 1	Level 2	Level 3
Assets				
Cash equivalents:				
Money market fund deposits and term deposits	$ 218,984	$ 218,984	$ —	$ —
U.S. Treasury and agency obligations	6,999	—	6,999	—
Commercial paper	162,749	—	162,749	—
Corporate bonds	29,010	—	29,010	—
Short-term investments:				
U.S. Treasury and agency obligations	49,996	—	49,996	—
Municipal bonds	7,997	—	7,997	—
Corporate bonds	88,171	—	88,171	—
Commercial paper	368,665	—	368,665	—
Total	$ 932,571	$ 218,984	$ 713,587	$ —
Liabilities				
Long-term debt	$ 38,402	$ —	$ 38,402	$ —
Contingent purchase consideration	1,963	—	—	1,963
Interest rate swaps	603	—	603	—
Total	$ 40,968	$ —	$ 39,005	$ 1,963

(In thousands, except share and per share data)

Short-term investments consist of liquid investments including U.S. government and government agency notes, corporate bonds, commercial paper and certificates of deposit with original maturities of greater than three months but less than one year and are recorded at amortized cost. There were no impairments for the investments considered held-to-maturity during the quarters ended March 31, 2021 and 2020. There were no current expected credit loss allowances for the investments considered held-to-maturity at March 31, 2021 and 2020. The Company holds highly-rated held-to-maturity instruments that are within one year of maturity.

The following table presents the effective maturity dates of debt investments, which are held-to-maturity:

	March 31, 2021		December 31, 2020	
	Book Value	**Fair Value**	**Book Value**	**Fair Value**
Investment maturity				
Less than 1 year	$ 548,196	$ 548,141	$ 514,835	$ 514,829

The Company entered into an interest rate swap that is designated as a cash flow hedge associated with a long-term note issued during the second quarter of 2016 that will terminate with the long-term note in May 2023. The fair value at March 31, 2021 for the interest rate swap considered pricing models whose inputs are observable for the securities held by the Company.

At March 31, 2021 and December 31, 2020, the Company's long-term notes consisted of a variable rate note and a fixed rate note, and are reported at amortized cost on the condensed consolidated balance sheets. For disclosure purposes, the fair value of the long-term notes was estimated using a discounted cash flow model using observable market interest rates and are classified as a level 2. Based on the discounted cash flow model, the fair values of the long-term notes at March 31, 2021 and December 31, 2020 were $37,296 and $38,402 respectively, as compared to the book value of $37,021 and $37,967, respectively.

The fair values of contingent purchase consideration at March 31, 2021 and December 31, 2020 were determined using an income approach at the respective business combination date and at the reporting date. The approach is based on significant inputs that are not observable in the market and include key assumptions such as assessing the probability of meeting certain milestones required to earn the contingent purchase consideration.

The following table presents information about the Company's movement in Level 3 assets and liabilities measured at fair value:

	Three Months Ended March 31,	
	2021	**2020**
Auction rate securities		
Balance, beginning of period	$ —	$ 592
Change in fair value and accretion	—	2
Balance, end of period	$ —	$ 594
Contingent purchase consideration		
Balance, beginning of period	$ 1,963	$ 273
Cash payments	(466)	(272)
Foreign exchange adjustment	(154)	(1)
Balance, end of period	$ 1,343	$ —

(In thousands, except share and per share data)

6. INVENTORIES

Inventories consist of the following:

	March 31, 2021	December 31, 2020
Components and raw materials	$ 190,376	$ 190,775
Work-in-process	38,066	47,251
Finished goods	139,707	126,967
Total	$ 368,149	$ 364,993

The Company recorded inventory provisions totaling $8,027 and $8,451 for the three months ended March 31, 2021 and 2020, respectively. These provisions relate to the recoverability of the value of inventories due to technological changes and excess quantities. These provisions are reported as a reduction to components and raw materials and finished components and devices.

7. GOODWILL AND INTANGIBLES

The following table sets forth the changes in the carrying amount of goodwill:

	Three Months Ended March 31, 2021	2020
Balance at January 1	$ 41,366	$ 82,092
Adjustment to goodwill during measurement period	(2,205)	—
Foreign exchange adjustment	(397)	(465)
Balance at March 31	$ 38,764	$ 81,627

During the fourth quarter of 2020, the Company acquired Pi-Tecnologia S.A. ("PiTec"), which is located in Brazil, to support development in advanced photonics. The acquisition price was $2,717, of which $906 was paid at closing and the remainder of which may be earned over three years based on achievement of certain financial targets. The acquisition date contingent purchase consideration amount was $1,811. The Company paid $466 of the contingent purchase consideration on January 31, 2021. The liabilities related to the contingent purchase consideration were included in accrued expenses and other current liabilities and deferred taxes and other long-term liabilities as of March 31, 2021 and December 31, 2020. During the first quarter of 2021, the Company finalized the purchase price allocations related to the intangible assets, which resulted in adjusting the amounts that were provisionally reported as goodwill to intangible assets for customer relationships and production know-how. This adjustment reduced goodwill by $2,205, increased intangible assets by $2,929 and increased deferred tax liabilities by $724. After completion of the purchase price allocations, the $724 excess of the acquisition consideration over the fair value of assets acquired and liabilities assumed was recorded to goodwill. The goodwill arising from this acquisition will not be deductible for tax purposes.

Intangible assets, subject to amortization, consisted of the following:

	March 31, 2021				December 31, 2020			
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Weighted-Average Lives	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Weighted-Average Lives
Customer relationships	$ 59,740	$ (19,232)	$ 40,508	10 years	$ 58,041	$ (17,674)	$ 40,367	11 years
Technology, trademark and trade name	40,443	(22,206)	18,237	7 years	40,518	(20,949)	19,569	7 years
Production know-how	10,413	(8,299)	2,114	7 years	9,325	(8,167)	1,158	7 years
Patents	8,036	(7,127)	909	8 years	8,036	(7,016)	1,020	8 years
Total	$ 118,632	$ (56,864)	$ 61,768		$ 115,920	$ (53,806)	$ 62,114	

Amortization expense for the three months ended March 31, 2021 and 2020 was $3,257 and $3,133, respectively. The estimated future amortization expense for intangibles for the remainder of 2021 and subsequent years is as follows:

2021 [a]	2022	2023	2024	2025	Thereafter	Total
$ 9,132	$ 11,409	10,508	$ 8,019	$ 6,505	$ 16,195	$ 61,768

[a] For the nine-month period beginning April 1, 2021.

(In thousands, except share and per share data)

8. ACCRUED EXPENSES AND OTHER LIABILITIES

Accrued expenses and other liabilities consist of the following:

	March 31, 2021	December 31, 2020
Accrued compensation	$ 53,690	$ 62,785
Contract liabilities	69,526	71,246
Current portion of accrued warranty	24,056	24,345
Short-term lease liabilities	5,596	5,778
Other	9,907	12,586
Total	$ 162,775	$ 176,740

9. PRODUCT WARRANTIES

The Company typically provides one to five years parts and service warranties on lasers, laser and non-laser systems, and amplifiers. Most of the Company's sales offices provide support to customers in their respective geographic areas. Warranty reserves have generally been sufficient to cover product warranty repair and replacement costs.

Activity related to the warranty accrual was as follows:.

	Three Months Ended March 31,	
	2021	2020
Balance at January 1	$ 45,669	$ 48,866
Provision for warranty accrual	8,403	5,001
Warranty claims	(7,446)	(7,241)
Foreign currency translation	(1,382)	(822)
Balance at March 31	$ 45,244	$ 45,804

Accrued warranty reported in the accompanying condensed consolidated financial statements as of March 31, 2021 and December 31, 2020 consisted of $24,056 and $24,345 in accrued expenses and other liabilities, respectively, and $21,188 and $21,324 in other long-term liabilities, respectively.

10. FINANCING ARRANGEMENTS

The Company's borrowings under existing financing arrangements consist of the following:

	March 31, 2021	December 31, 2020
Total notes payable	$ 37,021	$ 37,967
Less: current portion	(3,828)	(3,810)
Total long-term debt	$ 33,193	$ 34,157

Term Debt:

At March 31, 2021, the Company has an unsecured long-term note with an outstanding principal balance of $18,109, of which, $1,187 is the current portion. The interest on this unsecured long-term note is variable at 1.20% above LIBOR and is fixed using an interest rate swap at 2.85% per annum. The unsecured long-term note matures in May 2023, at which time the outstanding principal balance will be $15,438. Also at March 31, 2021, the Company has another long-term note that is secured by its corporate aircraft with an outstanding principal balance of $18,912, of which, $2,641 is the current portion. The interest on this collateralized long-term note is fixed at 2.74% per annum. The collateralized long-term note matures in July 2022, at which time the outstanding principal balance will be $15,375.

(In thousands, except share and per share data)

The future principal payments for the Company’s Notes as of March 31, 2021 are as follows:

2021 [(a)]	$	2,864
2022		18,126
2023		16,031
Total	$	37,021

[(a)] For the nine-month period beginning April 1, 2021.

Revolving Line of Credit Facilities:

The Company maintains a $75,000 U.S. revolving line of credit and a €50,000 ($58,635) line-of-credit in Germany, both of which are available to certain foreign subsidiaries and allow for borrowings in the local currencies of those subsidiaries. The Company also maintains a €2,000 ($2,345) Italian overdraft facility. At March 31, 2021 and December 31, 2020, there were no amounts drawn on the U.S. line-of-credit, and there were $3,293 and $3,300, respectively, of guarantees issued against the facility which reduce the amount of the facility available to draw. At March 31, 2021 and December 31, 2020, there were no amounts drawn on the Euro line-of-credit, and there were $2,895 and $3,424, respectively, of guarantees issued against those facilities which reduce the amount available to draw. At March 31, 2021 and December 31, 2020, there were no amounts drawn on the Euro overdraft facility. After providing for the guarantees used, the total unused lines-of-credit and overdraft facilities are $129,792 at March 31, 2021.

11. DERIVATIVE FINANCIAL INSTRUMENTS

The Company's only outstanding derivative financial instrument is an interest rate swap that is classified as a cash flow hedge of its variable rate debt. The fair value amounts in the condensed consolidated balance sheets were:

	March 31, 2021	December 31, 2020
Notional amounts [(1)]	$ 18,109	$ 18,406
Fair values:		
Deferred income taxes and other long-term liabilities	$ 514	$ 603

[(1)] Notional amounts represent the gross contract/notional amount of the derivatives outstanding.

The derivative gains and losses in the condensed consolidated financial statements related to the Company's current and previous interest rate swap contracts were as follows:

	Three Months Ended March 31,	
	2021	2020
Effective portion recognized in other comprehensive income, pretax:		
Interest rate swap	$ 89	$ 46

12. COMMITMENTS AND CONTINGENCIES

From time to time, the Company may be involved in disputes and legal proceedings in the ordinary course of its business. These proceedings may include allegations of infringement of intellectual property, commercial disputes and employment matters. As of March 31, 2021 and through the filing date of these condensed consolidated financial statements, the Company has no legal proceedings ongoing that management estimates could have a material effect on the Company's condensed consolidated financial statements.

13. INCOME TAXES

The effective tax rates were 23.0% and 23.5% for the three months ended March 31, 2021 and 2020, respectively. There were net discrete tax benefits of $4,288 and $2,787 for the three months ended March 31, 2021 and 2020, respectively, which were primarily related to the tax deductions for equity-based compensation that exceeded compensation expense recognized for books.

(In thousands, except share and per share data)

The Company accounts for its uncertain tax positions in accordance with the accounting standards for income taxes. The Company continues to classify interest and penalties related to unrecognized tax benefits as a component of the provision for income taxes. The following is a summary of the activity of the Company’s unrecognized tax benefits for three months ended March 31, 2021 and 2020:

	Three Months Ended March 31,	
	2021	2020
Balance at January 1,	$ 14,706	$ 11,416
Additions for tax positions in current period	1,000	400
Foreign currency translation	(182)	(1,101)
Balance at March 31,	$ 15,524	$ 10,715

Substantially all of the liability for uncertain tax benefits related to various federal, state and foreign income tax matters would benefit the Company's effective tax rate, if recognized.

14. NET INCOME ATTRIBUTABLE TO IPG PHOTONICS CORPORATION PER COMMON SHARE

The following table sets forth the computation of diluted net income attributable to IPG Photonics Corporation per common share following the treasury stock method:

	Three Months Ended March 31,	
	2021	2020
Net income attributable to IPG Photonics Corporation common stockholders	$ 68,127	$ 36,403
Basic weighted average common shares	53,541	53,075
Dilutive effect of common stock equivalents	660	601
Diluted weighted average common shares	54,201	53,676
Basic net income attributable to IPG Photonics Corporation per common share	$ 1.27	$ 0.69
Diluted net income attributable to IPG Photonics Corporation per common share	$ 1.26	$ 0.68

The computation of diluted weighted average common shares excludes common stock equivalents including non-qualified stock options, performance stock units ("PSUs"), restricted stock units ("RSUs") and employee stock purchase plan ("ESPP") because the effect of including them would be anti-dilutive. The weighted average anti-dilutive shares outstanding for the three months ended March 31, 2021 and 2020 were as follows:

	Three Months Ended March 31,	
	2021	2020
Non-qualified stock options	202,500	622,700
Restricted stock units	61,100	198,000
Performance stock units	13,800	50,300
Total weighed average anti-dilutive shares outstanding	277,400	871,000

On May 5, 2020, the Company announced that its Board of Directors authorized the purchase of up to $200,000 of IPG common stock. This authorization is separate from, and in addition to, the Company's $125,000 stock repurchase program authorized in February 2019. Under the February 2019 authorization, IPG may repurchase shares of common stock in an amount not to exceed the lesser of the number of shares issued to employees and directors under the Company's various employee and director equity compensation and employee stock purchase plans from January 1, 2019 through December 31, 2020 or $125,000. Under the 2020 authorization, the Company may purchase shares up to $200,000. In both purchase authorizations, share limits are exclusive of fees, commissions or other expenses. Share repurchases may be made periodically in open-market transactions using the Company's working capital and are subject to market conditions, legal requirements and other factors. The share purchase program authorization does not obligate the Company to repurchase any dollar amount or number of its shares, and repurchases may be commenced or suspended from time to time without prior notice.

For the three months ended March 31, 2021, the Company repurchased 14,906 shares of common stock under the February 2019 authorization with an average price of $204.48 per share in the open market. The impact on the reduction of weighted average shares for the three months ended March 31, 2021 was 461 shares. As of March 31, 2021 the remaining amount authorized under the programs was up to $243,000, but may be less depending upon the equity compensation and employee stock purchase plan dilution during the programs.

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion in conjunction with our condensed consolidated financial statements and related notes included elsewhere in this Quarterly Report on Form 10-Q. This discussion contains forward looking statements that are based on management's current expectations, estimates and projections about our business and operations. Our actual results may differ materially from those currently anticipated and expressed in such forward-looking statements. See "Cautionary Statement Regarding Forward-Looking Statements."

Overview

We develop, manufacture and sell high-performance fiber lasers, fiber amplifiers and diode lasers that are used for diverse applications, primarily in materials processing. We also manufacture and sell complementary products used with our lasers including optical delivery cables, fiber couplers, beam switches, optical processing heads, in-line sensors and chillers. In addition, we offer laser-based and non-laser based systems for certain markets and applications. Our portfolio of laser solutions are used in materials processing, communications, medical and advanced applications. We sell our products globally to original equipment manufacturers ("OEMs"), system integrators and end users. We market our products internationally, primarily through our direct sales force. Our major manufacturing facilities are located in the United States, Germany, Russia and Belarus. We have sales service offices and applications laboratories worldwide.

We are vertically integrated such that we design and manufacture most of the key components used in our finished products, from semiconductor diodes to optical fiber preforms, finished fiber lasers, amplifiers and complementary products. Our vertically integrated operations allow us to reduce manufacturing costs, control quality, rapidly develop and integrate advanced products and protect our proprietary technology.

Factors and Trends That Affect Our Operations and Financial Results

In reading our financial statements, you should be aware of the following factors and trends that our management believes are important in understanding our financial performance.

COVID-19 Update. Global demand trends have been impacted adversely by the ongoing COVID-19 pandemic and therefore remain uncertain at this time. Economic indicators continue to show improvement from the severe contraction experienced one year ago, which has led to an improvement in the recent demand environment in certain regions. It is difficult to predict whether the improvement in some macroeconomic indicators will be sustained or if it could change if there are additional restrictions imposed as a result of a resurgence in COVID-19 infections. This uncertainty continues to make forecasting our business challenging in the near to medium term.

Currently, our four major production facilities in the United States, Germany, Russia and Belarus remain open and are operating with enhanced employee safety and sanitization protocols that have not significantly impacted productivity and efficiency. We have vertically integrated manufacturing, and many of the components one facility supplies to another facility are single sourced internally and not available from third party suppliers, for example our semiconductor diodes manufactured in Oxford, Massachusetts. While we have attempted to build safety stock of critical components at our various locations, if government restrictions to address COVID-19 become more severe than we have experienced to date or if there was significant absenteeism as a result of COVID-19 or resurgence in the places where we operate, it could impact our internal supply chain. If our revenues are reduced for an extended period or if our production output falls because of government restrictions or absenteeism, we may be required to reduce payroll-related costs and other expenses in the future through layoffs, furloughs or reduced hours, even though we have not done so to date.

We have not experienced significant supply disruption from third party component suppliers however lead times have increased for certain electronic components in particular. We have also faced constraints related to logistics, including available air cargo space and higher freight rates during the pandemic. While the impact of these constraints has moderated, they could recur if there is a resurgence in the virus, and we may experience delays in the future if governments implement new restrictions. We believe we have the ability to meet the near-term demand for our products, but the situation is fluid and subject to change.

We continue to monitor the rapidly evolving conditions and circumstances as well as guidance from international and domestic authorities, including public health authorities, and we may need to take additional actions based on their recommendations. The measures implemented by various authorities related to the COVID-19 outbreak have caused us to change our business practices including those related to where employees work, the distance between employees in our facilities, limitations on in-person meetings between employees and with customers, suppliers, service providers, and stakeholders as well as restrictions on business travel to domestic and international locations or to attend trade shows, investor conferences and other events. To date, we have been able to accommodate these changes to our business operations and continue to meet customer demand. If guidelines from relevant authorities becomes more restrictive due to a resurgence of COVID-19 in a particular region, the effect on our operations could be more significant.

Net sales. Our net sales have historically fluctuated from quarter to quarter. The increase or decrease in sales from a prior quarter can be affected by the timing of orders received from customers, the shipment, installation and acceptance of products at our customers' facilities, the mix of OEM orders and one-time orders for products with large purchase prices, competitive pressures, acquisitions, economic and political conditions in a certain country or region and seasonal factors such as the purchasing patterns and levels of activity throughout the year in the regions where we operate. Net sales can be affected by the time taken to qualify our products for use in new applications in the end markets that we serve. Our sales cycle varies substantially, ranging from a period of a few weeks to as long as one year or more, but is typically several months. The adoption of our products by a new customer or qualification in a new application can lead to an increase in net sales for a period, which may then slow until we penetrate new markets or obtain new customers.

Our business depends substantially upon capital expenditures by end users, particularly by manufacturers using our products for materials processing, which includes general manufacturing, automotive, other transportation, aerospace, heavy industry, consumer, semiconductor and electronics. Approximately 92% of our revenues for the first quarter of 2021 and 90% of our revenues for the full 2020 fiscal year were from customers using our products for materials processing. Although applications within materials processing are broad, the capital equipment market in general is cyclical and historically has experienced sudden and severe downturns. For the foreseeable future, our operations will continue to depend upon capital expenditures by end users of materials processing equipment and will be subject to the broader fluctuations of capital equipment spending.

In recent years, our net sales have been negatively impacted by tariffs and trade policy. New tariffs and other changes in U.S. trade policy could trigger retaliatory actions by affected countries, and certain foreign governments.

We are also susceptible to global or regional disruptions such as political instability, geopolitical conflicts, acts of terrorism, significant fluctuations in currency values, natural disasters, macroeconomic concerns and particularly the impact of the COVID-19 outbreak that affect the level of capital expenditures or global commerce. With respect to the COVID-19 outbreak specifically, while our financial results for the three months ended March 31, 2021 improved as compared to quarterly results achieved during 2020, the possible effect over the longer term continues to remain uncertain and dependent on future developments that cannot be accurately predicted at this time, such as the severity and transmission rate of the coronavirus or new variants, the extent and effectiveness of containment actions taken, the approval, effectiveness, timing and widespread inoculation of the global population with new vaccines, and the impact of these and other factors on our customer base and general commercial activity.

The average selling prices of our products generally decrease as the products mature. These decreases result from factors such as increased competition, decreased manufacturing costs and increases in unit volumes. We may also reduce selling prices in order to penetrate new markets and applications. Furthermore, we may negotiate discounted selling prices from time to time with certain customers that place high unit-volume orders.

The secular shift to fiber laser technology in large materials processing applications, such as cutting applications, had a positive effect on our sales trends in the past such that our sales trends were often better than other capital equipment manufacturers in both positive and negative economic cycles. As the secular shift to fiber laser technology matures in such applications, our sales trends are more susceptible to economic cycles which affect other capital equipment manufacturers.

Gross margin. Our total gross margin in any period can be significantly affected by total net sales in any period, by competitive factors, by product mix, and by other factors such as changes in foreign exchange rates relative to the U.S. Dollar, some of which are not under our control. For instance,

- As our products mature, we can experience additional competition which tends to decrease average selling prices and affects gross margin;

- Our gross margin can be significantly affected by product mix. Within each of our product categories, the gross margin is generally higher for devices with greater average power. The higher power products often have better performance, more difficult specifications to attain and fewer competing products in the marketplace;

- Higher power lasers also use a greater number of optical components, improving absorption of fixed overhead costs and enabling economies of scale in manufacturing;

- The gross margin for certain specialty products may be higher because there are fewer or sometimes no equivalent competing products;
- Customers that purchase devices in greater unit volumes generally are provided a lower price per device than customers that purchase fewer units. In general, lower selling prices to high unit volume customers reduce gross margin although this may be partially offset by improved absorption of fixed overhead costs associated with larger product volumes, which drive economies of scale in manufacturing; and finally,
- Gross margin on systems and communication components can be lower than the gross margin for our laser and amplifier sources, depending on the configuration, volume and competitive forces, among other factors.

We expect that some new technologies, products and systems will have returns above our cost of capital but may have gross margins below our corporate average. If we are able to develop opportunities that are significant in size, competitively advantageous or leverage our existing technology base and leadership, our current gross margin levels may not be maintained. Instead, we aim to deliver industry-leading gross margin by growing sales, by taking market share in existing markets, or by developing new applications and markets we address, by reducing the cost of our products and by optimizing the efficiency of our manufacturing operations. For instance, despite the decreases in sales in 2020, manufacturing levels remained high and our facilities increased production as we manufactured more optical power products at lower average selling prices.

A high proportion of our costs is fixed so costs are generally difficult to adjust or may take time to adjust in response to changes in demand. In addition, our fixed costs increase as we expand our capacity. If we expand capacity faster than is required by sales growth, gross margins could be negatively affected. Gross margins generally decline if production volumes are lower as a result of a decrease in sales or a reduction in inventory because the absorption of fixed manufacturing costs will be reduced. Gross margins generally improve when the opposite occurs. If both sales and inventory decrease in the same period, the decline in gross margin may be greater if we cannot reduce fixed costs or choose not to reduce fixed costs to match the decrease in the level of production. If we experience a decline in sales that reduces absorption of our fixed costs, or if we have production issues, our gross margins will be negatively affected.

We also regularly review our inventory for items that are slow-moving, have been rendered obsolete or determined to be excess. Any provision for such slow-moving, obsolete or excess inventory affects our gross margins. For example, we recorded provisions for slow-moving, obsolete or excess inventory totaling $8.0 million and $8.5 million for the three months ended March 31, 2021 and 2020, respectively.

Selling and general and administrative expenses. In the past, we have invested in selling and general and administrative costs in order to support continued growth in the Company. As the secular shift to fiber laser technology matures, our sales growth becomes more susceptible to the cyclical trends typical of capital equipment manufacturers. Accordingly, our future management of and investments in selling and general and administrative expenses will also be influenced by these trends, although we may still invest in selling or general and administrative functions to support certain initiatives even in economic down cycles. Certain general and administrative expenses are not related to the level of sales and may vary quarter to quarter based primarily upon the level of acquisitions and litigation.

Research and development expenses. We plan to continue to invest in research and development to improve our existing components and products and develop new components, products, systems and applications technology. We believe that these investments will sustain our position as a leader in the fiber laser industry and will support development of new products that can address new markets and growth opportunities. The amount of research and development expense we incur may vary from period to period.

Goodwill and long-lived assets impairments. We review our intangible assets and property, plant and equipment for impairment when events or changes in circumstances indicate the carrying value may not be recoverable. Goodwill is required to be tested for impairment at least annually. Negative industry or economic trends, including reduced estimates of future cash flows, disruptions to our business, slower growth rates, lack of growth in our relevant business units or differences in the estimated product acceptance rates could lead to impairment charges against our long-lived assets, including goodwill and other intangible assets.

Our valuation methodology for assessing impairment requires management to make significant judgments and assumptions based on historical experience and to rely heavily on projections of future operating performance at many points during the analysis. Also, the process of evaluating the potential impairment of goodwill is subjective. We operate in a highly competitive environment and projections of future operating results and cash flows may vary significantly from actual results. If our analysis indicates potential impairment to goodwill in one or more of our reporting units, we may be required to record charges to earnings in our financial statements, which could negatively affect our results of operations.

As discussed above, we continue to monitor the effect of the COVID-19 pandemic on our business and the potential affect it may have on the recoverability of our long-lived assets. The future effects of COVID-19 remain uncertain. If the future effects of COVID-19 accumulate and become larger or if our ability to predict the impact becomes more certain, it may become a triggering event which would cause us to evaluate the carrying value of our amortizable long-lived assets or to evaluate the carrying value of goodwill prior to the annual assessment date. If our analysis indicates potential impairment to goodwill, amortizable intangibles or right-of-use assets in one or more of our reporting units, we may be required to record charges to earnings in our financial statements, which would negatively affect our results of operations.

Foreign exchange. Because we are a U.S.-based company doing business globally, we have both translational and transactional exposure to fluctuations in foreign currency exchange rates. Changes in the relative exchange rate between the U.S. dollar and the foreign currencies in which our subsidiaries operate directly affects our sales, costs and earnings. Differences in the relative exchange rates between where we sell our products and where we incur manufacturing and other operating costs (primarily in the U.S., Germany, Russia and Belarus) also affects our costs and earnings. Certain currencies experiencing significant exchange rate fluctuations like the Euro, the Russian Ruble, the Japanese Yen and Chinese Yuan have had and could have an additional significant impact on our sales, costs and earnings. The depreciation of the Euro and Russian Ruble, partially offset by the depreciation of the Chinese Yuan created a foreign exchange gain for the quarter ended March 31, 2021 because our European and Russian subsidiaries have certain net assets denominated in U.S. Dollars, and our Chinese subsidiary has certain net liabilities denominated in U.S. Dollars. Our ability to adjust the foreign currency selling prices of products in response to changes in exchange rates is limited and may not offset the impact of the changes in exchange rates on the translated value of sales or costs. In addition, if we increase the selling price of our products in local currencies, this could have a negative impact on the demand for our products.

Major customers. While we have historically depended on a few customers for a large percentage of our annual net sales, the composition of this group can change from year to year. Net sales derived from our five largest customers as a percentage of our net sales was 24% for the three months ended March 31, 2021 and 24%, 21% and 26% for the full years 2020, 2019 and 2018, respectively. One of our customers accounted for 22% and 21% of our net accounts receivable as of March 31, 2021 and December 31, 2020, respectively. We seek to add new customers and to expand our relationships with existing customers. We anticipate that the composition of our significant customers will continue to change. We generally do not enter into agreements with our customers obligating them to purchase a fixed number or large volume of our fiber lasers or amplifiers. If any of our significant customers substantially reduced their purchases from us, our results would be adversely affected.

Results of Operations for the Three Months Ended March 31, 2021 Compared to the Three Months Ended March 31, 2020

Net sales. Net sales increased by $96.4 million, or 38.7%, to $345.6 million for the three months ended March 31, 2021 from $249.2 million for the three months ended March 31, 2020.

The table below sets forth sales by application:

	Three Months Ended March 31,				Change	
	2021		2020			
	(In thousands, except for percentages)					
Sales by Application		% of Total		% of Total		
Materials processing	$ 317,241	91.8 %	$ 218,074	87.5 %	$ 99,167	45.5 %
Other applications	28,344	8.2 %	31,168	12.5 %	(2,824)	(9.1)%
Total	$ 345,585	100.0 %	$ 249,242	100.0 %	$ 96,343	38.7 %

The table below sets forth sales by type of product and other revenue:

	Three Months Ended March 31,				
	2021		2020		Change
	(In thousands, except for percentages)				
Sales by Product		% of Total		% of Total		
High Power Continuous Wave ("CW") Lasers	$ 170,482	49.3 %	$ 119,316	47.9 %	$ 51,166	42.9 %
Medium Power CW Lasers	15,882	4.6 %	11,253	4.5 %	4,629	41.1 %
Pulsed Lasers	55,395	16.0 %	31,839	12.8 %	23,556	74.0 %
Quasi-Continuous Wave ("QCW") Lasers	13,666	4.0 %	9,873	4.0 %	3,793	38.4 %
Laser and Non-Laser Systems	27,116	7.8 %	18,634	7.5 %	8,482	45.5 %
Other Revenue including Amplifiers, Service, Parts, Accessories and Change in Deferred Revenue	63,044	18.3 %	58,327	23.3 %	4,717	8.1 %
Total	$ 345,585	100.0 %	$ 249,242	100.0 %	$ 96,343	38.7 %

Materials processing

Sales for materials processing applications increased due to higher sales from high power lasers, pulsed lasers, laser and non-laser systems, medium power lasers, other laser products and service, and QCW lasers. Sales for material processing applications improved as markets recover from being negatively affected by the COVID-19 pandemic in early 2020.

- The increase in high power laser sales related to metal cutting and welding applications. Within cutting applications, increased sales were attributable to a recovery in the global demand environment from the impacts of a global lockdown related to the COVID-19 pandemic, primarily in China; partially offset by a decline in average selling prices and increased competition. Part of the decline in average selling prices for high power lasers is due to the adoption of more compact or rack mounted "YLR" series lasers, which are displacing 1 to 3 kilowatt "YLS" series lasers, which are larger, more complex and more expensive. These more compact YLR lasers are less expensive to manufacture and are sold at prices lower than the YLS series lasers they are displacing. The increase in sales of high power lasers used in welding applications was driven by higher sales into general manufacturing industries.

- Medium power sales increased due to increased demand in laser sintering for metal-based additive manufacturing.

- Pulsed laser sales increased due to growth in sales of high power pulsed lasers used for battery processing applications including foil cutting, solar cell manufacturing, and marking and engraving applications.

- QCW laser sales increased due to increased demand for fine processing and consumer electronics applications.

- Laser and non-laser systems sales increased due to higher demand of laser systems for cutting and welding applications, partially offset by decreased demand of non-laser systems in the transportation and aerospace sectors.

- Other Revenue for materials processing increased due to higher parts and service revenue.

Other applications

Sales from other applications decreased due to lower demand in lasers used for medical procedures, partially offset by increased demand in lasers used for instrument and directed energy applications.

Cost of sales and gross margin. Cost of sales increased by $35.2 million, or 24.0%, to $181.6 million for the three months ended March 31, 2021 from $146.4 million for the three months ended March 31, 2020. Our gross margin increased to 47.5% for the three months ended March 31, 2021 from 41.3% for the three months ended March 31, 2020. The increase in gross margin was driven mainly by an increase in absorption of manufacturing expenses as a percent of sales due to higher sales. Gross margin also benefitted from lower cost of products sold and a reduction in provisions for inventory reserves versus the year ago period.

Sales and marketing expense. Sales and marketing expense increased by $0.2 million, or 1.1%, to $18.9 million for the three months ended March 31, 2021 compared with $18.7 million for the three months ended March 31, 2020. This change was primarily a result of increases in personnel costs partially offset by decreases in trade fair and exhibits. As a percentage of sales, sales and marketing expense decreased to 5.5% for the three months ended March 31, 2021 from 7.5% for the three months ended March 31, 2020, mainly due to increased sales.

Research and development expense. Research and development expense increased by $1.5 million, or 4.7%, to $33.3 million for the three months ended March 31, 2021, compared to $31.8 million for the three months ended March 31, 2020. This change was primarily a result of increases in personnel costs. As a percentage of sales, research and development expense decreased to 9.6% for the three months ended March 31, 2021 from 12.8% for the three months ended March 31, 2020, mainly due to the increase in sales.

General and administrative expense. General and administrative expense increased by $3.0 million, or 11.1%, to $30.1 million for the three months ended March 31, 2021 from $27.1 million for the three months ended March 31, 2020. This change was primarily a result of increases in personnel costs, information systems and gifts and donations. As a percentage of sales, general and administrative expense decreased to 8.7% for the three months ended March 31, 2021 from 10.9% for the three months ended March 31, 2020, mainly due to the increase in sales.

Effect of exchange rates on net sales, gross profit and operating expenses. We estimate that, if exchange rates relative to the U.S. Dollar had been the same as one year ago, which were on average Euro 0.91, Russian Ruble 67, Japanese Yen 109 and Chinese Yuan 6.98, respectively, we would have expected net sales to be $16.9 million lower, gross profit to be $10.0 million lower and total operating expenses to be $0.6 million higher.

(Gain) loss on foreign exchange. We incurred a foreign exchange gain of $7.2 million for the three months ended March 31, 2021 as compared to a $19.6 million gain for the three months ended March 31, 2020. The foreign exchange gain for the three months ended March 31, 2021 was primarily attributable to the depreciation of the Euro and Russian Ruble, partially offset by a loss attributed to the depreciation of the Chinese Yuan as compared to the U.S. Dollar. The foreign exchange gain for the three months ended March 31, 2020 was primarily attributable to depreciation of the Russian Ruble and Euro, partially offset by a loss attributed to the depreciation of the Chinese Yuan as compared to the U.S. Dollar.

Interest (expense) income, net. Interest expense, net was $0.5 million for the three months ended March 31, 2021 compared to interest income, net of $3.1 million for the three months ended March 31, 2020. The change in interest (expense) income, net is due to a reduction in yields on cash equivalents and short term investments.

Provision for income taxes. Provision for income taxes was $20.4 million (23.0% of pre-tax income) for the three months ended March 31, 2021 compared to $11.3 million (23.5% of pre-tax income) for the three months ended March 31, 2020. The higher tax expense in 2021 is primarily due to an increase in income.

Net income attributable to IPG Photonics Corporation. Net income attributable to IPG Photonics Corporation increased by $31.7 million to $68.1 million for the three months ended March 31, 2021 compared to $36.4 million for the three months ended March 31, 2020. Net income attributable to IPG Photonics Corporation as a percentage of our net sales increased by 5.1 percentage points to 19.7% for the three months ended March 31, 2021 from 14.6% for the three months ended March 31, 2020 due to the factors described above.

Liquidity and Capital Resources

The following table presents our principal sources of liquidity:

	March 31, 2021	**December 31, 2020**
	(In thousands)	
Cash and cash equivalents	$ 896,741	$ 876,231
Short-term investments	548,196	514,835
Unused credit lines and overdraft facilities	129,792	132,048
Working capital (excluding cash, cash equivalents and short-term investments)	542,571	542,433

Short-term investments at March 31, 2021, consist of liquid investments including U.S. Treasury and agency obligations, corporate bonds, commercial paper and certificates of deposit with original maturities of greater than three months but less than one year. See Note 5, "Fair Value Measurements" in the notes to the condensed consolidated financial statements for further information about our short-term investments.

We believe that our existing cash and cash equivalents, short-term investments, our cash flows from operations and our existing lines of credit provide us with the financial flexibility to meet our liquidity and capital needs. We expect to continue investments in capital expenditures, to assess acquisition opportunities and to repurchase shares of our stock in accordance with our repurchase program. The extent and timing of such expenditures may vary from period to period. Our future long-term capital requirements will depend on many factors including our level of sales, the impact of the economic environment on our growth including any ongoing impact of the COVID-19 pandemic on certain global or regional economies, global or regional recessions, the timing and extent of spending to support development efforts, expansion of global sales and marketing activities, government regulation including trade sanctions, the timing and introductions of new products, the need to ensure access to adequate manufacturing capacity and the continuing market acceptance of our products.

The following table details our line-of-credit facilities and long-term notes as of March 31, 2021:

Description	Total Facility/ Note	Interest Rate	Maturity	Security
U.S. Revolving Line of Credit [(1)]	$75.0 million	LIBOR plus 0.80% to 1.20%, depending on our performance	April 2025	Unsecured
Euro Credit Facility (Germany) [(2)]	Euro 50.0 million ($58.6 million)	Euribor plus 0.75% or EONIA plus 1.00%	July 2023	Unsecured, guaranteed by parent company and German subsidiary
Other Euro Facility [(3)]	Euro 2.0 million ($2.3 million)	Euribor plus 0.98% to 2.02%	June 2021	Common pool of assets of Italian subsidiary
Long-term Secured Note [(4)]	$18.9 million	Fixed at 2.74%	July 2022	Secured by the corporate aircraft
Long-term Unsecured Note [(5)]	$18.1 million	1.20% above LIBOR, fixed using an interest rate swap at 2.85% per annum	May 2023	Unsecured

(1) This facility is available to certain foreign subsidiaries in their respective local currencies. At March 31, 2021, there were no amounts drawn on this line; however, there were $3.3 million of guarantees issued against the line which reduces total availability.
(2) This facility is also available to certain foreign subsidiaries in their respective local currencies. At March 31, 2021, there were no drawings on this facility; however, there were $2.9 million of guarantees issued against the line which reduces total availability.
(3) At March 31, 2021, there were no drawings. This facility renews annually.
(4) At maturity, the outstanding note balance will be $15.4 million.
(5) At maturity, the outstanding note balance will be $15.4 million.

Our largest committed credit lines are with Bank of America N.A. and Deutsche Bank AG in the amounts of $75.0 million and $58.6 million (or 50.0 million Euro as described above), respectively, and neither of them is syndicated. We plan to seek amendments of our credit agreements and notes to modify LIBOR and Euribor reference rates as these rates are phased out as borrowing rates.

We are required to meet certain financial covenants associated with our U.S. revolving line of credit and long-term debt facility. These covenants, tested quarterly, include an interest coverage ratio and a funded debt to earnings before interest, taxes, depreciation and amortization ("EBITDA") ratio. The interest coverage covenant requires that we maintain a trailing twelve-month ratio of EBITDA to interest on all obligations that is at least 3.0:1.0. The funded debt to EBITDA covenant requires that the sum of all indebtedness for borrowed money on a consolidated basis be less than three times our trailing twelve months EBITDA. Funded debt is decreased by our cash and available marketable securities not classified as long-term investments in the U.S.A. in excess of $50 million up to a maximum of $500 million. We were in compliance with all such financial covenants as of and for the three months ended March 31, 2021.

The financial covenants in our loan documents may cause us to not make or to delay investments and actions that we might otherwise undertake because of limits on capital expenditures and amounts that we can borrow or lease. In the event that we do not comply with any one of these covenants, we would be in default under the loan agreement or loan agreements, which may result in acceleration of the debt, cross-defaults on other debt or a reduction in available liquidity, any of which could harm our results of operations and financial condition.

See Note 10, "Financing Arrangements" in the notes to the condensed consolidated financial statements for further information about our facilities and term debt.

The following table presents cash flow activities:

	Three Months Ended March 31,	
	2021	2020
	(In thousands)	
Cash provided by operating activities	$ 87,543	$ 56,781
Cash used in investing activities	(60,694)	(139,754)
Cash used in financing activities	(1,637)	(20,792)

Operating activities. Net cash provided by operating activities increased by $30.7 million to $87.5 million for the three months ended March 31, 2021 from $56.8 million for the three months ended March 31, 2020. In 2021, net sales and net income increased by 39% and 86%, respectively. As there were increases in net sales and net income, cash provided by net income after adding back non-cash charges increased. This increase has been partially offset by an increase in the amount invested in working capital. Our largest working capital items typically are inventory and accounts receivable. Items such as accounts payable to third parties, prepaid expenses and other current assets and accrued expenses and other liabilities are not as significant as our working capital investment in accounts receivable and inventory because of our vertically integrated structure. Accruals and payables for personnel costs including bonuses and income and other taxes payable are largely dependent on the timing of payments for those items. The increase in cash provided by operating activities in 2021 primarily resulted from an increase in cash provided by net income after adding back non-cash charges, an increase in cash provided by accounts payable, a decrease in cash used by prepaid expenses, and a decrease in cash used by income and other taxes payable; partially offset by, a decrease in cash provided by accounts receivable, an increase in cash used by accrued expenses, and an increase in cash used by inventory.

Investing activities. Net cash used in investing activities was $60.7 million for the three months ended March 31, 2021 as compared to cash used in investing activities of $139.8 million in 2020. The cash used in investing activities in 2021 related to $33.4 million of net purchases of short-term investments and $27.4 million of capital expenditures. The cash used in investing activities in 2020 related to $122.2 million of net purchases of short-term investments and $17.8 million of capital expenditures.

In 2021, we expect to incur between $150 million and $160 million in capital expenditures, excluding acquisitions. Capital expenditures include investments in property, facilities and equipment to add capacity worldwide to support anticipated revenue growth, increase vertical integration, increase redundant manufacturing capacity for critical components and enhance research and development capabilities. The timing and extent of any capital expenditures in and between periods can have a significant effect on our cash flow. If we obtain financing for certain projects, our cash expenditures would be reduced in the year of expenditure. Many of the capital expenditure projects that we undertake have long lead times and are difficult to cancel or defer to a later period.

Financing activities. Net cash used in financing activities was $1.6 million for the three months ended March 31, 2021 as compared to net cash used of $20.8 million in 2020. The cash used in financing activities in 2021 related to the purchase of treasury stock of $3.0 million, $2.6 million of payments of purchase price holdbacks from business combinations and $0.9 million of principal payments on our long-term borrowings; partially offset by, proceeds of $5.0 million from the exercise of stock options net of amounts disbursed in relation to shares withheld to cover employee income taxes due upon the vesting and release of restricted stock units. The cash used in financing activities in 2020 was primarily related to the purchase of treasury stock of $12.7 million, $5.5 million from the exercise of stock options net of amounts disbursed in relation to shares withheld to cover employee income taxes due upon the vesting and release of restricted stock units and $0.9 million of principal payments on our long-term borrowings.

Cautionary Statement Regarding Forward-Looking Statements

This Quarterly Report on Form 10-Q contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934, and we intend that such forward-looking statements be subject to the safe harbors created thereby. For this purpose, any statements contained in this Quarterly Report on Form 10-Q except for historical information are forward-looking statements. Without limiting the generality of the foregoing, words such as "may," "will," "expect," "believe," "anticipate," "intend," "could," "estimate," or "continue" or the negative or other variations thereof or comparable terminology are intended to identify forward-looking statements. In addition, any statements that refer to projections of our future financial performance, trends in our businesses, or other characterizations of future events or circumstances are forward-looking statements.

The forward-looking statements included herein are based on current expectations of our management based on available information and involve a number of risks and uncertainties, all of which are difficult or impossible to accurately predict and many of which are beyond our control. As such, our actual results may differ significantly from those expressed in any forward-looking statements. 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 of the Form 10-K filed with the SEC for the year ended December 31, 2020 (the "Annual Report"). Readers should carefully review these risks, as well as the additional risks described in other documents we file from time to time with the Securities and Exchange Commission. In light of the significant risks and uncertainties inherent in the forward-looking information included herein, the inclusion of such information should not be regarded as a representation by us or any other person that such results will be achieved, and readers are cautioned not to rely on such forward-looking information. We undertake no obligation to revise the forward-looking statements contained herein to reflect events or circumstances after the date hereof or to reflect the occurrence of unanticipated events.

Recent Accounting Pronouncements

See Note 2 in the Notes to Condensed Consolidated Financial Statements for a full description of recent accounting pronouncements, including the respective dates of adoption or expected adoption and effects on our condensed consolidated financial statements contained in Item 1 of this Quarterly Report.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We are exposed to market risk in the ordinary course of business, which consists primarily of interest rate risk associated with our cash and cash equivalents and our debt and foreign exchange rate risk.

Interest rate risk. Certain interest rates are variable and fluctuate with current market conditions. Our investments have limited exposure to market risk. We maintain a portfolio of cash, cash equivalents and short-term investments consisting primarily of bank deposits, money market funds, certificates of deposit, commercial paper, corporate bonds and government and agency securities. None of these investments have a maturity date in excess of one year. Because of the short-term nature of these instruments, a sudden change in market interest rates would not be expected to have a material impact on our financial condition or results of operations.

We are also exposed to market risk as a result of increases or decreases in the amount of interest expense we must pay on our bank debt and borrowings on our bank credit facilities. Our interest obligations on our long-term debt are fixed either by the underlying agreement or by means of an interest rate swap agreement. Although our U.S. revolving line of credit and our Euro credit facility have variable rates, we do not believe that a 10% change in market interest rates would have a material impact on our financial position or results of operations.

Exchange rates. Due to our international operations, a significant portion of our net sales, cost of sales and operating expenses are denominated in currencies other than the U.S. Dollar, principally the Euro, the Russian Ruble, the Chinese Yuan and the Japanese Yen. As a result, our international operations give rise to transactional market risk associated with exchange rate movements of the U.S. Dollar, the Euro, the Russian Ruble, the Chinese Yuan and the Japanese Yen. The gain on foreign exchange transactions totaled $7.2 million for the three months ended March 31, 2021 compared to a gain of $19.6 million for the three months ended March 31, 2020. Management attempts to minimize these exposures by partially or fully off-setting foreign currency denominated assets and liabilities at our subsidiaries that operate in different functional currencies. The effectiveness of this strategy can be limited by the volume of underlying transactions at various subsidiaries and by our ability to accelerate or delay inter-company cash settlements. As a result, we are unable to create a perfect offset of the foreign currency denominated assets and liabilities. At March 31, 2021, our material foreign currency exposure is net U.S. Dollar denominated assets at subsidiaries where the Euro or the Russian Ruble is the functional currency and U.S. Dollar denominated liabilities where the Chinese Yuan is the functional currency. The U.S. Dollar denominated assets are comprised of cash, third party receivables and inter-company receivables. The U.S. Dollar denominated liabilities are comprised of inter-company payables. A 5% change in the relative exchange rate of the U.S. Dollar to the Euro as of March 31, 2021 applied to the net U.S. Dollar asset balances, would result in a foreign exchange gain of $6.8 million if the U.S. Dollar appreciated and a $7.1 million foreign exchange loss if the U.S. Dollar depreciated. A 5% change in the relative exchange rate of the U.S. Dollar to the Russian Ruble as of March 31, 2021 applied to the net U.S. Dollar asset balances, would result in a foreign exchange gain of $3.7 million if the U.S. Dollar appreciated and a $3.9 million foreign exchange loss if the U.S. Dollar depreciated. A 5% change in the relative exchange rate of the U.S. Dollar to the Chinese Yuan as of March 31, 2021 applied to the net U.S. Dollar liabilities balances, would result in a foreign exchange loss of $6.6 million if the U.S. Dollar appreciated and a $7.0 million foreign exchange gain if the U.S. Dollar depreciated. It is possible that the COVID-19 Pandemic may create additional volatility in exchange rates going forward.

In addition, we are exposed to foreign currency translation risk for those subsidiaries whose functional currency is not the U.S. Dollar as changes in the value of their functional currency relative to the U.S. Dollar can adversely affect the translated amounts of our revenue, expenses, net income, assets and liabilities. This can, in turn, affect the reported value and relative growth of sales and net income from one period to the next. In addition, changes in the translated value of assets and liabilities due to changes in functional currency exchange rates relative to the U.S. Dollar result in foreign currency translation adjustments that are a component of other comprehensive income or loss.

Foreign currency derivative instruments can also be used to hedge exposures and reduce the risks of certain foreign currency transactions; however, these instruments provide only limited protection and can carry significant cost. We have no foreign currency derivative instruments as of March 31, 2021. We will continue to analyze our exposure to currency exchange rate fluctuations and may engage in financial hedging techniques in the future to attempt to minimize the effect of these potential fluctuations. Exchange rate fluctuations may adversely affect our financial results in the future.

ITEM 4. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

Under the supervision of our chief executive officer and our chief financial officer, our management has evaluated the effectiveness of the design and operation of our "disclosure controls and procedures" (as defined in Rules 13a-15(e) and 15d-15(e) promulgated under the Securities Exchange Act of 1934, as amended (the "Exchange Act")), as of the end of the period covered by this Quarterly Report on Form 10-Q (the "Evaluation Date"). Based upon that evaluation, our chief executive officer and our chief financial officer have concluded that, as of the Evaluation Date, our disclosure controls and procedures are effective.

Changes in Internal Controls

There was no change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) promulgated under the Exchange Act) that occurred during the last fiscal quarter that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting. We are continually monitoring and assessing the COVID-19 situation on our internal controls to minimize the impact on their design and operating effectiveness.

PART II—OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

Information with respect to this item may be found in Note 12, "Commitments and Contingencies" in the Notes to Condensed Consolidated Financial Statements in Part I, Item 1 of this Quarterly Report and is incorporated herein by reference.

ITEM 1A. RISK FACTORS

In addition to the other information in this Quarterly Report on Form 10-Q, you should carefully consider the factors discussed in Item 1A of Part I of our Annual Report on Form 10-K for the year ended December 31, 2020, which could materially and adversely affect our financial condition, results of operations or cash flows, or cause our actual results to differ materially from those projected in any forward-looking statements. We may also face other risks and uncertainties that are not presently known, are not currently believed to be material, or are not identified in our Annual Report because they are common to all businesses.

ITEM 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS

The following table reflects issuer purchases of equity securities for the three months ended March 31, 2021:

	Total Number of Shares (or Units) Purchased		Average Price Paid per Share (or Unit)	Total Number of Shares (or Units) Purchased as Part of Publicly Announced Plans or Programs	Maximum Number (or Approximate Dollar Value) of Shares (or Units) that May Yet Be Purchased Under the Plans or Programs
January 1, 2021 — January 31, 2021	—		$ —	—	$ 246,386
February 1, 2021 — February 28, 2021	—		—	—	246,386
March 1, 2021 — March 31, 2021	50,320	(1), (2), (3)	221.57	14,906	243,336
Total	50,320		$ 221.57	14,906	$ 243,336

(1) In 2012, our Board of Directors approved "withhold to cover" as a tax payment method for vesting of restricted stock awards for certain employees. Pursuant to the "withhold to cover" method, we withheld from such employees the shares noted in the table above to cover tax withholding related to the vesting of their awards. For the three months ended March 31, 2021 a total of 35,414 shares were withheld at an average price of $228.77.

(2) On February 12, 2019, we announced that our Board of Directors authorized the purchase of up to $125 million of IPG common stock (the "February 2019 program") following the completion of our $125 million repurchase program authorized in July 2018. Under the February 2019 program, we are authorized to repurchase shares of common stock in an amount not to exceed the lesser of (a) the number of shares issued to employees and directors under the Company's various employee and director equity compensation and employee stock purchase plans from January 1, 2019 through December 31, 2020 and (b) $125 million, exclusive of any fees, commissions or other expenses. We repurchased 14,906 shares in the first quarter of 2021 under the February 2019 authorization.

(3) On May 5, 2020, we announced that our Board of Directors authorized the purchase of up to $200 million of IPG common stock (the "May 2020 program"), exclusive of any fees, commissions or other expenses. The May 2020 program is separate from, and in addition to, the repurchases authorized under the February 2019 program. There were no shares purchased in the first quarter of 2021 under the May 2020 authorization.

Share repurchases under both purchase authorizations may be made periodically in open-market transactions using the Company's working capital, and are subject to market conditions, legal requirements and other factors. The share purchase program authorizations do not obligate us to repurchase any dollar amount or number of our shares, and repurchases may be commenced or suspended from time to time without prior notice.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES

None.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

ITEM 5. OTHER INFORMATION

None.

ITEM 6. EXHIBITS

(a) Exhibits

Exhibit No.	Description
10.1	IPG Photonics Corporation Non-Employee Director Compensation Plan, as amended (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the Commission on February 22, 2021).
31.1	Certification of Chief Executive Officer pursuant to Rule 13a-14(a)
31.2	Certification of Chief Financial Officer pursuant to Rule 13a-14(a)
32	Certification of Chief Executive Officer and Chief Financial Officer pursuant to Section 1350
101.INS	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	XBRL Taxonomy Extension Schema
101.CAL	XBRL Taxonomy Extension Calculation Linkbase
101.LAB	XBRL Taxonomy Extension Label Linkbase
101.PRE	XBRL Taxonomy Extension Presentation Linkbase
101.DEF	XBRL Taxonomy Extension Definition Linkbase
104	Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101)

SIGNATURES

Pursuant to the requirements 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.

IPG PHOTONICS CORPORATION

Date: May 5, 2021	By:	/s/ Eugene A. Scherbakov
		Eugene A. Scherbakov Chief Executive Officer (Principal Executive Officer)
Date: May 5, 2021	By:	/s/ Timothy P.V. Mammen
		Timothy P.V. Mammen Senior Vice President and Chief Financial Officer (Principal Financial Officer)

Exhibit 31.1

Certification of Chief Executive Officer

Pursuant to Rule 13a – 14(a) or Rule 15d – 14(a) of the Securities Exchange Act of 1934

I, Eugene A. Scherbakov, certify that:

1. I have reviewed this quarterly report on Form 10-Q of IPG Photonics Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the 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 signed 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: May 5, 2021

By: /s/ Eugene A. Scherbakov

Eugene A. Scherbakov
Chief Executive Officer (Principal Executive Officer)

Exhibit 31.2

Certification of Chief Financial Officer

Pursuant to Rule 13a – 14(a) or Rule 15d – 14(a) of the Securities Exchange Act of 1934

I, Timothy P.V. Mammen, certify that:

1. I have reviewed this quarterly report on Form 10-Q of IPG Photonics Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the 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: May 5, 2021

By: /s/ Timothy P.V. Mammen

Timothy P.V. Mammen
Senior Vice President and Chief Financial Officer (Principal Financial Officer)

Exhibit 32

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 filing of the Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2021 (the "Report") by IPG Photonics Corporation (the "Company"), Eugene A. Scherbakov, as the Chief Executive Officer of the Company, and Timothy P.V. Mammen, as the Chief Financial Officer of the Company, each hereby certifies pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to the best of his knowledge:

1 the Report fully complies with the requirements of Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934; and

2 the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: May 5, 2021

/s/ Eugene A. Scherbakov

Eugene A. Scherbakov
Chief Executive Officer

/s/ Timothy P.V. Mammen

Timothy P.V. Mammen
Senior Vice President and Chief Financial Officer

A signed original of this written statement required by 18 U.S.C. Section 1350 has been provided to IPG Photonics Corporation and will be retained by IPG Photonics Corporation and furnished to the Securities and Exchange Commission or its staff upon request.