

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 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 September 30, 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 0-23621

MKS INSTRUMENTS, INC.

(Exact name of registrant as specified in its charter)

Massachusetts
(State or other jurisdiction
of incorporation or organization)

2 Tech Drive, Suite 201, Andover, Massachusetts
(Address of principal executive offices)

04-2277512
(I.R.S. Employer
Identification No.)

01810
(Zip Code)

Registrant's telephone number, including area code (978) 645-5500

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

<u>Title of each class</u>	<u>Trading Symbol(s)</u>	<u>Name of each exchange on which registered</u>
Common Stock, no par value	MKSI	Nasdaq Global Select Market

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See 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	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>
		Emerging growth company	<input type="checkbox"/>

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

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

As of October 27, 2021, the registrant had 55,458,911 shares of common stock outstanding.

MKS INSTRUMENTS, INC.
FORM 10-Q
INDEX

PART I. FINANCIAL INFORMATION

ITEM 1.	<u>FINANCIAL STATEMENTS (Unaudited).</u>	3
	<u>Condensed Consolidated Balance Sheets – September 30, 2021 and December 31, 2020</u>	3
	<u>Condensed Consolidated Statements of Operations and Comprehensive Income – Three and nine months ended September 30, 2021 and 2020</u>	4
	<u>Condensed Consolidated Statements of Stockholders’ Equity – Three and nine months ended September 30, 2021 and 2020</u>	5
	<u>Condensed Consolidated Statements of Cash Flows – Nine months ended September 30, 2021 and 2020</u>	7
	<u>Notes to Unaudited Condensed Consolidated Financial Statements</u>	8
ITEM 2.	<u>MANAGEMENT’S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS.</u>	33
ITEM 3.	<u>QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.</u>	46
ITEM 4.	<u>CONTROLS AND PROCEDURES.</u>	46

PART II. OTHER INFORMATION

ITEM 1.	<u>LEGAL PROCEEDINGS.</u>	47
ITEM 1A.	<u>RISK FACTORS.</u>	47
ITEM 6.	<u>EXHIBITS.</u>	48

<u>SIGNATURES</u>		50
-------------------	--	----

PART I. FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS.

MKS INSTRUMENTS, INC.
 CONDENSED CONSOLIDATED BALANCE SHEETS
 (in millions, except per share data)
 (Unaudited)

ASSETS	September 30, 2021	December 31, 2020
Current assets:		
Cash and cash equivalents	\$ 633.3	\$ 608.3
Short-term investments	246.3	227.7
Trade accounts receivable, net of allowance for doubtful accounts of \$2.4 and \$2.0 at September 30, 2021 and December 31, 2020, respectively	443.4	392.7
Inventories	550.4	501.4
Other current assets	121.5	74.3
Total current assets	1,994.9	1,804.4
Property, plant and equipment, net	316.8	284.3
Right-of-use assets	184.5	184.4
Goodwill	1,226.2	1,066.4
Intangible assets, net	589.5	512.2
Long-term investments	6.4	6.5
Other assets	47.6	45.6
Total assets	\$ 4,365.9	\$ 3,903.8
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Short-term debt	\$ 9.0	\$ 14.5
Accounts payable	150.8	110.6
Accrued compensation	118.9	117.9
Income taxes payable	16.5	18.3
Lease liabilities	17.3	15.8
Deferred revenue and customer advances	37.6	31.2
Other current liabilities	87.0	65.6
Total current liabilities	437.1	373.9
Long-term debt, net	809.7	815.0
Non-current deferred taxes	98.5	59.2
Non-current accrued compensation	48.7	49.5
Non-current lease liabilities	193.0	187.4
Other non-current liabilities	50.3	57.9
Total liabilities	1,637.3	1,542.9
Commitments and contingencies (Note 19)		
Stockholders' equity:		
Preferred Stock, \$0.01 par value per share, 2 shares authorized; none issued and outstanding	—	—
Common Stock, no par value, 200 shares authorized; 55.5 and 55.2 shares issued and outstanding at September 30, 2021 and December 31, 2020, respectively	0.1	0.1
Additional paid-in capital	892.8	873.2
Retained earnings	1,853.0	1,487.3
Accumulated other comprehensive (loss) income	(17.3)	0.3
Total stockholders' equity	2,728.6	2,360.9
Total liabilities and stockholders' equity	\$ 4,365.9	\$ 3,903.8

The accompanying notes are an integral part of the unaudited condensed consolidated financial statements.

MKS INSTRUMENTS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
AND COMPREHENSIVE INCOME
(in millions, except per share data)
(Unaudited)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Net revenues:				
Products	\$ 649.1	\$ 506.8	\$ 1,910.8	\$ 1,441.0
Services	92.8	83.0	274.9	228.8
Total net revenues	741.9	589.8	2,185.7	1,669.8
Cost of revenues:				
Products	344.5	280.7	1,011.8	794.8
Services	49.0	47.1	148.2	127.1
Total cost of revenues (exclusive of amortization shown separately below)	393.5	327.8	1,160.0	921.9
Gross profit	348.4	262.0	1,025.7	747.9
Research and development	51.7	42.5	148.9	127.7
Selling, general and administrative	95.8	87.0	288.9	260.3
Acquisition and integration costs	8.6	0.5	20.8	3.4
Restructuring and other	2.0	3.1	9.9	6.8
Amortization of intangible assets	15.0	12.5	40.1	42.6
Asset impairment	—	—	—	1.2
COVID-19 related net credits	—	—	—	(1.2)
Income from operations	175.3	116.4	517.1	307.1
Interest income	0.1	0.1	0.4	1.1
Interest expense	6.3	6.6	19.1	22.7
Other expense, net	2.9	1.1	11.5	3.0
Income before income taxes	166.2	108.8	486.9	282.5
Provision for income taxes	33.8	17.1	85.7	48.0
Net income	\$ 132.4	\$ 91.7	\$ 401.2	\$ 234.5
Other comprehensive income, net of tax:				
Changes in value of financial instruments designated as cash flow hedges	\$ 3.0	\$ (0.6)	\$ 13.9	\$ (7.7)
Foreign currency translation adjustments	(18.2)	17.1	(31.6)	12.1
Net unrecognized pension gain	0.3	0.1	0.2	0.1
Unrealized (loss) gain on investments	—	—	(0.1)	0.2
Total comprehensive income	\$ 117.5	\$ 108.3	\$ 383.6	\$ 239.2
Net income per share:				
Basic	\$ 2.39	\$ 1.66	\$ 7.24	\$ 4.26
Diluted	\$ 2.38	\$ 1.66	\$ 7.21	\$ 4.24
Weighted average common shares outstanding:				
Basic	55.5	55.2	55.4	55.1
Diluted	55.7	55.4	55.7	55.3

The accompanying notes are an integral part of the unaudited condensed consolidated financial statements.

MKS INSTRUMENTS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(in millions, except per share data)
(Unaudited)

	Common Stock		Additional Paid-In Capital	Retained Earnings	Accumulated Other Comprehensive Income/(Loss)	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2020	55.2	\$ 0.1	\$ 873.2	\$ 1,487.3	\$ 0.3	\$ 2,360.9
Net issuance under stock-based plans	0.1		(5.3)			(5.3)
Stock-based compensation			10.0			10.0
Cash dividend (\$0.20 per common share)				(11.1)		(11.1)
Comprehensive income (net of tax):						
Net income				122.3		122.3
Other comprehensive loss					(7.8)	(7.8)
Balance at March 31, 2021	55.3	0.1	877.9	1,598.5	(7.5)	2,469.0
Net issuance under stock-based plans	0.1		(2.4)			(2.4)
Stock-based compensation			8.8			8.8
Cash dividend (\$0.22 per common share)				(12.2)		(12.2)
Comprehensive income (net of tax):						
Net income				146.5		146.5
Other comprehensive income					5.1	5.1
Balance at June 30, 2021	55.4	0.1	884.3	1,732.8	(2.4)	2,614.8
Net issuance under stock-based plans	0.1		(0.4)			(0.4)
Stock-based compensation			8.9			8.9
Cash dividend (\$0.22 per common share)				(12.2)		(12.2)
Comprehensive income (net of tax):						
Net income				132.4		132.4
Other comprehensive loss					(14.9)	(14.9)
Balance at September 30, 2021	55.5	\$ 0.1	\$ 892.8	\$ 1,853.0	\$ (17.3)	\$ 2,728.6

MKS INSTRUMENTS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY (continued)
(in millions, except per share data)
(Unaudited)

	Common Stock		Additional Paid-In Capital	Retained Earnings	Accumulated Other Comprehensive Income/(Loss)	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2019	54.6	\$ 0.1	\$ 864.3	\$ 1,181.2	\$ (22.3)	\$ 2,023.3
Net issuance under stock-based plans	0.3		(20.4)			(20.4)
Stock-based compensation			8.5			8.5
Cash dividend (\$0.20 per common share)				(11.0)		(11.0)
Comprehensive income (net of tax):						
Net income				69.1		69.1
Other comprehensive loss					(17.0)	(17.0)
Balance at March 31, 2020	54.9	0.1	852.4	1,239.3	(39.3)	2,052.5
Net issuance under stock-based plans	0.2		(0.5)			(0.5)
Stock-based compensation			6.8			6.8
Cash dividend (\$0.20 per common share)				(11.0)		(11.0)
Comprehensive income (net of tax):						
Net income				73.7		73.7
Other comprehensive income					5.1	5.1
Balance at June 30, 2020	55.1	0.1	858.7	1,302.0	(34.2)	2,126.6
Net issuance under stock-based plans	—		(4.5)			(4.5)
Stock-based compensation			7.4			7.4
Cash dividend (\$0.20 per common share)				(11.0)		(11.0)
Comprehensive income (net of tax):						
Net income				91.7		91.7
Other comprehensive income					16.6	16.6
Balance at September 30, 2020	55.1	\$ 0.1	\$ 861.6	\$ 1,382.7	\$ (17.6)	\$ 2,226.8

The accompanying notes are an integral part of the unaudited condensed consolidated financial statements.

MKS INSTRUMENTS, INC.
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(in millions)
(Unaudited)

	Nine Months Ended September 30,	
	2021	2020
Cash flows provided by operating activities:		
Net income	\$ 401.2	\$ 234.5
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	76.1	75.8
Unrealized gain on derivatives not designated as hedging instruments	(1.3)	(1.2)
Amortization of debt issuance costs, original issue discount, and soft call premium	1.8	2.1
Stock-based compensation	27.8	22.7
Provision for excess and obsolete inventory	13.6	19.8
Deferred income taxes	7.2	(0.7)
Asset impairment	—	1.2
Other	1.4	1.8
Changes in operating assets and liabilities:		
Trade accounts receivable	(51.3)	(20.9)
Inventories	(61.7)	(47.1)
Other current and non-current assets	(0.2)	10.9
Accounts payable	38.2	24.5
Accrued compensation	2.5	(5.8)
Income taxes payable	(28.7)	21.4
Other current and non-current liabilities	18.6	27.0
Net cash provided by operating activities	<u>445.2</u>	<u>366.0</u>
Cash flows used in investing activities:		
Acquisition of business, net of cash acquired	(268.4)	—
Purchases of investments	(497.0)	(358.2)
Maturities of investments	342.9	181.5
Sales of investments	134.6	64.3
Purchases of property, plant and equipment	(63.3)	(59.9)
Net cash used in investing activities	<u>(351.2)</u>	<u>(172.3)</u>
Cash flows used in financing activities:		
Net proceeds from borrowings	1.0	20.1
Payments on short-term and long-term borrowings	(12.8)	(77.0)
Dividend payments	(35.5)	(33.0)
Net payments related to employee stock awards	(14.4)	(25.4)
Net cash used in financing activities	<u>(61.7)</u>	<u>(115.3)</u>
Effect of exchange rate changes on cash and cash equivalents	(7.3)	0.3
Increase in cash and cash equivalents	25.0	78.7
Cash and cash equivalents at beginning of period	608.3	414.6
Cash and cash equivalents at end of period	<u>\$ 633.3</u>	<u>\$ 493.3</u>

The accompanying notes are an integral part of the unaudited condensed consolidated financial statements

1) Basis of Presentation

The terms “MKS” and the “Company” refer to MKS Instruments, Inc. and its subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation. The interim financial data as of September 30, 2021, and for the three and nine months ended September 30, 2021 are unaudited; however, in the opinion of MKS, the interim data includes all adjustments, consisting of normal recurring adjustments, necessary for a fair statement of the results for the interim periods. The condensed consolidated balance sheet presented as of December 31, 2020 has been derived from the consolidated audited financial statements as of that date. The unaudited condensed consolidated financial statements presented herein have been prepared in accordance with the instructions to Form 10-Q and do not include all of the information and note disclosures required by United States generally accepted accounting principles (“U.S. GAAP”). The unaudited condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements and notes thereto included in the MKS Annual Report on Form 10-K for the year ended December 31, 2020 filed with the U.S. Securities and Exchange Commission on February 23, 2021.

The preparation of these unaudited condensed consolidated financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent liabilities at the date of the unaudited condensed consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. On an on-going basis, management evaluates its estimates and judgments, including those related to revenue recognition, inventory valuation, warranty costs, stock-based compensation, intangible assets, goodwill, other long-lived assets and other acquisition expenses and income taxes. Management bases its estimates and judgments on historical experience and on various other factors that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

2) Recently Issued or Adopted Accounting Pronouncements

In October 2021, the Financial Accounting Standards Board (“FASB”) issued Accounting Standards Update (“ASU”) 2021-08, “Business Combinations (Topic 805): Accounting for Contract Assets and Contract Liabilities from Contracts with Customers” (“ASU No. 2021-08”). ASU No. 2021-08 will require companies to apply the definition of a performance obligation under ASC Topic 606 to recognize and measure contract assets and contract liabilities (i.e., deferred revenue) relating to contracts with customers that are acquired in a business combination. Under current U.S. GAAP, an acquirer generally recognizes assets acquired and liabilities assumed in a business combination, including contract assets and contract liabilities arising from revenue contracts with customers, at fair value on the acquisition date. ASU No. 2021-08 will result in the acquirer recording acquired contract assets and liabilities on the same basis that would have been recorded by the acquiree before the acquisition under ASC Topic 606. ASU No. 2021-08 is effective for fiscal years beginning after December 15, 2022, with early adoption permitted. The Company is currently evaluating the impact of this ASU on its financial statements.

In March 2020, the FASB issued ASU No. 2020-04, “Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting.” This standard provides temporary optional expedients and exceptions to accounting guidance on contract modifications and hedge accounting to ease entities’ financial reporting burdens as the market transitions from the London Interbank Offered Rate (“LIBOR”) and other interbank offered rates to alternative reference rates. The standard was effective upon issuance and generally can be applied through December 31, 2022. In January 2021, the FASB issued ASU 2021-01, “Reference Rate Reform (Topic 848): Scope.” The amendments in this update clarify that certain optional expedients and exceptions in Topic 848 for contract modifications and hedge accounting apply to derivative instruments that use an interest rate for margining, discounting, or contract price alignment that is modified as a result of reference rate reform. Amendments in this update to the expedients and exceptions in Topic 848 capture the incremental consequences of the scope clarification and tailor the existing guidance to derivative instruments affected by the discounting transition. The amendments in this update do not apply to contract modifications made after December 31, 2022, new hedging relationships entered into after December 31, 2022, and existing hedging relationships evaluated for effectiveness in periods after December 31, 2022, except for hedging relationships existing as of December 31, 2022, that apply certain optional expedients in which the accounting effects are recorded through the end of the hedging relationship (including periods after December 31, 2022). The Company’s adoption of the requirements of these standards has not resulted in a material impact on its financial position, results of operations and cash flows, but the adoption of the requirements may impact the Company in the future.

In December 2019, the FASB issued ASU 2019-12, “Income Taxes (Topic 740).” This standard simplifies the accounting for income taxes by removing certain exceptions to the general principles in Topic 740. The amendments also improve consistent

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

application and simplify U.S. GAAP for other areas of Topic 740 by clarifying and amending existing guidance. This standard is effective for annual periods, and interim periods within those fiscal years, beginning after December 15, 2020. The Company adopted this ASU during the first quarter of 2021 and the adoption of this ASU did not have a material impact on its financial position, results of operations and cash flows.

3) Revenue from Contracts with Customers

Contract assets as of September 30, 2021 and December 31, 2020 were \$3.8 and \$3.7, respectively, and are included in other current assets. A rollforward of the Company's deferred revenue and customer advances is as follows:

	Nine Months Ended	
	September 30, 2021	September 30, 2020
Beginning balance, January 1 ⁽¹⁾	\$ 36.7	\$ 24.8
Additions to deferred revenue and customer advances	68.1	76.3
Amount of deferred revenue and customer advances recognized in income	(63.7)	(65.6)
Ending balance, September 30 ⁽²⁾	<u>\$ 41.1</u>	<u>\$ 35.5</u>

- (1) Beginning deferred revenue and customer advances as of January 1, 2021 included \$18.4 of current deferred revenue, \$5.5 of long-term deferred revenue and \$12.8 of current customer advances.
- (2) Ending deferred revenue and customer advances as of September 30, 2021 included \$20.0 of current deferred revenue, \$3.5 of long-term deferred revenue and \$17.6 of current customer advances.

Disaggregation of Revenue

The following table summarizes revenue from contracts with customers:

	Three Months Ended September 30, 2021			
	Vacuum & Analysis	Light & Motion	Equipment & Solutions	Total
Net revenues:				
Products	\$ 425.7	\$ 190.8	\$ 32.6	\$ 649.1
Services	57.4	17.9	17.5	92.8
Total net revenues	<u>\$ 483.1</u>	<u>\$ 208.7</u>	<u>\$ 50.1</u>	<u>\$ 741.9</u>

	Three Months Ended September 30, 2020			
	Vacuum & Analysis	Light & Motion	Equipment & Solutions	Total
Net revenues:				
Products	\$ 313.9	\$ 156.9	\$ 36.0	\$ 506.8
Services	47.4	19.0	16.6	83.0
Total net revenues	<u>\$ 361.3</u>	<u>\$ 175.9</u>	<u>\$ 52.6</u>	<u>\$ 589.8</u>

	Nine Months Ended September 30, 2021			
	Vacuum & Analysis	Light & Motion	Equipment & Solutions	Total
Net revenues:				
Products	\$ 1,203.7	\$ 531.5	\$ 175.6	\$ 1,910.8
Services	172.9	52.1	49.9	274.9
Total net revenues	<u>\$ 1,376.6</u>	<u>\$ 583.6</u>	<u>\$ 225.5</u>	<u>\$ 2,185.7</u>

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

	Nine Months Ended September 30, 2020			
	Vacuum & Analysis	Light & Motion	Equipment & Solutions	Total
Net revenues:				
Products	\$ 863.5	\$ 457.3	\$ 120.2	\$ 1,441.0
Services	131.6	50.0	47.2	228.8
Total net revenues	\$ 995.1	\$ 507.3	\$ 167.4	\$ 1,669.8

Product revenue, excluding revenue from certain custom products, is recorded at a point in time, while the majority of the service revenue and revenue from certain custom products is recorded over time.

4) Investments

The following tables show the gross unrealized gains and (losses) aggregated by investment category for available-for-sale investments:

As of September 30, 2021:	Cost	Gross Unrealized Gains	Gross Unrealized (Losses)	Estimated Fair Value
Short-term investments:				
Time deposits and certificates of deposit	\$ 24.0	\$ —	\$ —	\$ 24.0
Bankers' acceptance drafts	2.5	—	—	2.5
Commercial paper	86.2	—	—	86.2
Corporate obligations	35.3	—	—	35.3
U.S. treasury obligations	98.3	—	—	98.3
	\$ 246.3	\$ —	\$ —	\$ 246.3

As of September 30, 2021:	Cost	Gross Unrealized Gains	Gross Unrealized (Losses)	Estimated Fair Value
Long-term investments:				
Group insurance contracts	\$ 5.5	\$ 0.9	\$ —	\$ 6.4

As of December 31, 2020:	Cost	Gross Unrealized Gains	Gross Unrealized (Losses)	Estimated Fair Value
Short-term investments:				
Time deposits and certificates of deposit	\$ 0.7	\$ —	\$ —	\$ 0.7
Bankers' acceptance drafts	3.8	—	—	3.8
U.S. treasury obligations	223.2	—	—	223.2
	\$ 227.7	\$ —	\$ —	\$ 227.7

As of December 31, 2020:	Cost	Gross Unrealized Gains	Gross Unrealized (Losses)	Estimated Fair Value
Long-term investments:				
Group insurance contracts	\$ 5.6	\$ 0.9	\$ —	\$ 6.5

Management has the ability to liquidate its investments in order to meet the Company's liquidity needs in the next 12 months. Accordingly, those investments with contractual maturities greater than one year from the date of purchase are classified as short-term on the accompanying balance sheets.

Interest income is accrued as earned. Dividend income is recognized as income on the date the security trades "ex-dividend." The cost of marketable securities sold is determined by the specific identification method. Realized gains or losses are reflected in income and were not material for the three and nine months ended September 30, 2021 and 2020.

5) Fair Value Measurements

In accordance with the provisions of fair value accounting, a fair value measurement assumes that the transaction to sell an asset or transfer a liability occurs in the principal market for the asset or liability or, in the absence of a principal market, the most advantageous market for the asset or liability and defines fair value based upon an exit price model.

The fair value measurement guidance establishes a fair value hierarchy which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The guidance describes three levels of inputs that may be used to measure fair value:

- Level 1 Quoted prices in active markets for identical assets or liabilities as of the reporting date. Active markets are those in which transactions for the asset or liability occur in sufficient frequency and volume to provide pricing information on an ongoing basis.
- Level 2 Observable inputs other than Level 1 prices, such as quoted prices for similar assets or liabilities; quoted prices in markets that are not active; or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities. Level 2 assets and liabilities include debt securities with quoted prices that are traded less frequently than exchange-traded instruments or securities or derivative contracts that are valued using a pricing model with inputs that are observable in the market or can be derived principally from or corroborated by observable market data.
- Level 3 Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities. Level 3 assets and liabilities include financial instruments whose value is determined using pricing models, discounted cash flow methodologies, or similar techniques, as well as instruments for which the determination of fair value requires significant management judgment or estimation.

In certain cases, the inputs used to measure fair value may fall into different levels of the fair value hierarchy. In such cases, the Company categorizes such assets and liabilities based on the lowest level input that is significant to the fair value measurement in its entirety. The Company's assessment of the significance of a particular input to the fair value measurement in its entirety requires judgment and considers factors specific to the asset or liability.

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

Assets and liabilities of the Company are measured at fair value on a recurring basis as of September 30, 2021 and are summarized as follows:

Description	September 30, 2021	Fair Value Measurements at Reporting Date Using		
		Quoted Prices in Active Markets for Identical Assets or Liabilities (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Cash equivalents:				
Money market funds	\$ 44.7	\$ 44.7	\$ —	\$ —
Commercial paper	0.1	—	0.1	—
U.S. treasury obligations	17.5	—	17.5	—
Available-for-sale investments:				
Time deposits and certificates of deposit	23.9	—	23.9	—
Bankers' acceptance drafts	2.5	—	2.5	—
Commercial paper	86.2	—	86.2	—
Corporate obligations	35.3	—	35.3	—
U.S. treasury obligations	98.3	—	98.3	—
Group insurance contracts	6.4	—	6.4	—
Derivatives – foreign exchange forward contracts	3.0	—	3.0	—
Derivatives – interest rate hedge-non-current	3.7	—	3.7	—
Funds in investments and other assets:				
Israeli pension assets	19.3	—	19.3	—
Deferred compensation plan assets:				
Mutual funds and exchange traded funds	1.6	—	1.6	—
Total assets	\$ 342.5	\$ 44.7	\$ 297.8	\$ —
Liabilities:				
Derivatives –foreign exchange forward contracts	\$ 0.7	\$ —	\$ 0.7	\$ —
Derivatives – interest rate hedge – non-current	7.5	—	7.5	—
Total liabilities	\$ 8.2	\$ —	\$ 8.2	\$ —
Reported as follows:				
Assets:				
Cash equivalents	\$ 62.3	\$ 62.2	\$ 0.1	\$ —
Short-term investments	246.2	—	246.2	—
Other current assets	3.0	—	3.0	—
Total current assets	\$ 311.5	\$ 62.2	\$ 249.3	\$ —
Long-term investments	\$ 6.4	\$ —	\$ 6.4	\$ —
Other assets	24.6	—	24.6	—
Total long-term assets	\$ 31.0	\$ —	\$ 31.0	\$ —
Liabilities:				
Other current liabilities	\$ 0.7	\$ —	\$ 0.7	\$ —
Other liabilities	\$ 7.5	\$ —	\$ 7.5	\$ —

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

Assets and liabilities of the Company are measured at fair value on a recurring basis as of December 31, 2020 and are summarized as follows:

Description	December 31, 2020	Fair Value Measurements at Reporting Date Using		
		Quoted Prices in Active Markets for Identical Assets or Liabilities (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets:				
Cash equivalents:				
Money market funds	\$ 1.3	\$ 1.3	\$ —	\$ —
Commercial paper	0.3	—	0.3	—
U.S. treasury obligations	62.1	—	62.1	—
Available-for-sale investments:				
Time deposits and certificates of deposit	0.7	—	0.7	—
Bankers' acceptance drafts	3.8	—	3.8	—
U.S. treasury obligations	223.2	—	223.2	—
Group insurance contracts	6.5	—	6.5	—
Funds in investments and other assets:				
Israeli pension assets	18.8	—	18.8	—
Deferred compensation plan assets:				
Mutual funds and exchange traded funds	1.7	—	1.7	—
Total assets	\$ 318.4	\$ 1.3	\$ 317.1	\$ —
Liabilities:				
Derivatives – foreign exchange forward contracts	\$ 6.5	\$ —	\$ 6.5	\$ —
Derivatives – interest rate hedge - non-current	14.0	—	14.0	—
Total liabilities	\$ 20.5	\$ —	\$ 20.5	\$ —
Reported as follows:				
Assets:				
Cash equivalents	\$ 63.7	\$ 1.3	\$ 62.4	\$ —
Short-term investments	227.7	—	227.7	—
Total current assets	\$ 291.4	\$ 1.3	\$ 290.1	\$ —
Long-term investments	\$ 6.5	\$ —	\$ 6.5	\$ —
Other assets	20.5	—	20.5	—
Total long-term assets	\$ 27.0	\$ —	\$ 27.0	\$ —
Liabilities:				
Other current liabilities	\$ 6.5	\$ —	\$ 6.5	\$ —
Other liabilities	\$ 14.0	\$ —	\$ 14.0	\$ —

Money Market Funds

Money market funds are cash equivalents and are classified within Level 1 of the fair value hierarchy.

Available-For-Sale Investments

The Company measures its debt and equity investments at fair value. The Company's available-for-sale investments are classified within Level 2 of the fair value hierarchy.

Israeli Pension Assets

Israeli pension assets represent investments in mutual funds, government securities and other time deposits. These investments are set aside for the retirement benefit of the employees of the Company's Israeli subsidiaries. These funds are classified within Level 2 of the fair value hierarchy.

Derivatives

As a result of the Company's global operating activities, the Company is exposed to market risks from changes in foreign currency exchange rates and variable interest rates, which may adversely affect its operating results and financial position. When deemed appropriate, the Company minimizes its risks from foreign currency exchange rate and interest rate fluctuations through the use of derivative financial instruments. The principal market in which the Company executes its foreign currency contracts and interest rate swaps is the institutional market in an over-the-counter environment with a relatively high level of price transparency. The market participants are typically large commercial banks. The foreign exchange forward contracts and interest rate hedges are valued using broker quotations or market transactions and are classified within Level 2 of the fair value hierarchy.

6) Derivatives

The Company enters into derivative instruments for risk management purposes only, including derivatives designated as hedging instruments and those utilized as economic hedges. The Company operates internationally and, in the normal course of business, is exposed to fluctuations in interest rates and foreign exchange rates. These fluctuations can increase the costs of financing, investing and operating the business. The Company has used derivative instruments, such as foreign exchange forward contracts, to manage certain foreign currency exposure, and interest rate swaps to manage interest rate exposure.

By nature, all financial instruments involve market and credit risks. The Company enters into derivative instruments with major investment grade financial institutions, for which no collateral is required. The Company has policies to monitor the credit risk of these counterparties. While there can be no assurance, the Company does not anticipate any material non-performance by any of these counterparties.

Foreign Exchange Forward Contracts

The Company hedges a portion of its forecasted foreign currency-denominated intercompany sales of inventory, over a maximum period of eighteen months, using foreign exchange forward contracts accounted for as cash-flow hedges related to British, Euro, Japanese, South Korean and Taiwanese currencies. To the extent these derivatives are effective in off-setting the variability of the hedged cash flows, and otherwise meet the hedge accounting criteria, changes in the derivatives' fair value are not included in current earnings but are included in other comprehensive income ("OCI") in stockholders' equity. These changes in fair value will subsequently be reclassified into earnings, as applicable, when the forecasted transaction occurs. To the extent that a previously designated hedging transaction is no longer an effective hedge, any ineffectiveness measured in the hedging relationship is recorded in earnings in the period it occurs. The cash flows resulting from foreign exchange forward contracts are classified in the condensed consolidated statements of cash flows as part of cash flows from operating activities. The Company does not enter into derivative instruments for trading or speculative purposes.

In conjunction with the acquisition of Photon Control Inc., a Canada corporation ("Photon Control"), which closed in July 2021, the Company entered into a foreign currency contract to hedge the Canadian dollar purchase price. For the three and nine months ended September 30, 2021, the Company recorded a fair value loss of \$2.8 and \$10.3, respectively, which is included in other expense, net.

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

As of September 30, 2021 and December 31, 2020, the Company had outstanding foreign exchange forward contracts with gross notional values of \$207.6 and \$176.2, respectively. The following tables provide a summary of the primary net hedging positions and corresponding fair values held as of September 30, 2021 and December 31, 2020:

Currency Hedged (Buy/Sell)	September 30, 2021	
	Gross Notional Value	Fair Value(1)
U.S. dollar/Japanese yen	\$ 51.5	\$ 0.9
U.S. dollar/South Korean won	81.2	1.4
U.S. dollar/euro	14.4	0.1
U.S. dollar/U.K. pound sterling	6.9	—
U.S. dollar/Taiwan dollar	53.6	(0.1)
Total	<u>\$ 207.6</u>	<u>\$ 2.3</u>

Currency Hedged (Buy/Sell)	December 31, 2020	
	Gross Notional Value	Fair Value(1)
U.S. dollar/Japanese yen	\$ 61.5	\$ (1.1)
U.S. dollar/South Korean won	62.2	(3.1)
U.S. dollar/euro	13.1	(0.6)
U.S. dollar/U.K. pound sterling	6.1	(0.3)
U.S. dollar/Taiwan dollar	33.3	(1.4)
Total	<u>\$ 176.2</u>	<u>\$ (6.5)</u>

(1) Represents receivable (payable) amount included in the condensed consolidated balance sheet.

Interest Rate Swap Agreements

The Company entered into various interest rate swap agreements that exchange the variable LIBOR interest rate to a fixed rate in order to manage the exposure to interest rate fluctuations associated with the variable LIBOR interest rate paid on the outstanding balance of the Term Loan Facility, as defined and further described in Note 10. The table below summarizes the various interest rate hedges entered into by the Company:

Swap	Trade Date	Effective Date	Maturity	Fixed Rate	Notional Amount at Effective Date	September 30, 2021	September 30, 2021	December 31, 2020
						Notional Amount	Fair Value Asset (Liability)	Fair Value Asset (Liability)
1	April 3, 2019	April 5, 2019	March 31, 2023	2.309%	\$ 300.0	\$ 300.0	(7.5)	(12.4)
2	October 29, 2020	October 26, 2021	February 28, 2025	0.485%	\$ 200.0	—	2.3	(0.7)
3	October 29, 2020	March 31, 2022	February 28, 2025	0.623%	\$ 100.0	—	1.4	(0.9)
Total						<u>\$ —</u>	<u>\$ (3.8)</u>	<u>\$ (14.0)</u>

The interest rate swaps are recorded at fair value on the balance sheet and changes in the fair value are recognized in OCI. To the extent that these arrangements are no longer effective hedges, any ineffectiveness measured in the hedging relationships is recorded immediately in earnings in the period it occurs.

The following table provides a summary of the fair value amounts of the Company's derivative instruments:

Derivatives Designated as Hedging Instruments	September 30, 2021	December 31, 2020
Derivative assets:		
Foreign exchange forward contracts(1)	\$ 3.0	\$ —
Interest rate hedges(2)	3.7	—
Derivative liabilities:		
Foreign exchange forward contracts(1)	(0.7)	(6.5)
Interest rate hedge(2)	(7.5)	(14.0)
Total net derivative liability designated as hedging instruments	<u>\$ (1.5)</u>	<u>\$ (20.5)</u>

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

- (1) The derivative asset of \$3.0 and derivative liability of \$0.7 related to the foreign exchange forward contracts are classified in other current assets and other current liabilities in the condensed consolidated balance sheet as of September 30, 2021. The derivative liability of \$6.5 related to the foreign exchange forward contracts is classified in other current liabilities in the condensed consolidated balance sheet as of December 31, 2020. These foreign exchange forward contracts are subject to a master netting agreement with one financial institution. However, the Company has elected to record these contracts on a gross basis in the balance sheet.
- (2) The interest rate hedge asset of \$3.7 is classified in other non-current assets in the condensed consolidated balance sheet as of September 30, 2021. The interest rate hedge liabilities of \$7.5 and \$14.0 are classified in other non-current liabilities in the condensed consolidated balance sheet as of September 30, 2021 and December 31, 2020, respectively.

The net amount of existing gains as of September 30, 2021 that is expected to be reclassified from OCI into earnings within the next 12 months is immaterial.

The following table provides a summary of the gains (losses) on derivatives designated as cash flow hedging instruments:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Forward exchange forward contracts:				
Net (loss) gain recognized in accumulated OCI ⁽¹⁾	\$ 3.0	\$ (0.6)	\$ 13.9	\$ (7.7)
Net (loss) gain reclassified from accumulated OCI into income ⁽²⁾	\$ (0.2)	\$ 0.4	\$ (2.1)	\$ 2.2

- (1) Net change in the fair value of the effective portion classified in accumulated OCI.
- (2) Effective portion classified in cost of products for the three and nine months ended September 30, 2021 and 2020. The tax effect of the gains or losses reclassified from accumulated OCI into income is immaterial.

The following table provides a summary of the losses on derivatives not designated as hedging instruments:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Foreign exchange forward contracts:				
Net loss recognized in income ⁽¹⁾	\$ (2.2)	\$ (0.6)	\$ (9.0)	\$ (0.6)

- (1) The Company enters into foreign exchange forward contracts to hedge against changes in the balance sheet for certain subsidiaries to mitigate the risk associated with certain foreign currency transactions in the ordinary course of business. In conjunction with the acquisition of Photon Control, the Company entered into a foreign currency contract to hedge the Canadian dollar purchase price. These derivatives are not designated as hedging instruments and gains or losses from these derivatives are recorded in other (expense) income in the periods in which they occur.

7) Inventories

Inventories consist of the following:

	September 30, 2021	December 31, 2020
Raw materials	\$ 365.9	\$ 321.3
Work-in-process	84.9	76.7
Finished goods	99.6	103.4
	<u>\$ 550.4</u>	<u>\$ 501.4</u>

8) Leases

The Company has various operating leases for real estate and non-real estate items. The non-real estate leases are mainly comprised of automobiles but also include office equipment and other lower-valued items. The Company does not have any finance leases. As most of the Company's leases do not provide an implicit rate, an incremental borrowing rate is used based

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

on the estimated rate of interest for collateralized borrowing over a similar term of the lease payments at commencement date.

Some of the Company's real estate lease agreements include Company options to either extend and/or terminate the lease. The cost of these options is included in our operating lease liabilities to the extent that such options are reasonably certain of being exercised. Leases with renewal options allow the Company to extend the lease term typically between 1 to 10 years. When determining the lease term, renewal options reasonably certain of being exercised are included in the lease term. When determining if a renewal option is reasonably certain of being exercised, the Company considers several economic factors, including but not limited to, the significance of leasehold improvements made to the property, whether the physical space is difficult to replace, underlying contractual obligations, and specific characteristics unique to that particular lease that would make it reasonably certain that the Company would exercise such an option.

The Company has existing leases that include variable lease and non-lease components that are not included in the right-of-use asset and lease liability and are reflected as expenses in the periods incurred. Such payments primarily include common area maintenance charges and increases in rent payments that are driven by factors such as future changes in an index (e.g., the Consumer Price Index).

The elements of lease expense were as follows:

	Three Months Ended September 30,	
	2021	2020
Lease cost:		
Operating lease cost ⁽¹⁾	\$ 6.6	\$ 7.2
Short-term lease	1.2	1.4
Total lease cost	\$ 7.8	\$ 8.6
	Nine Months Ended September 30,	
	2021	2020
Lease cost:		
Operating lease cost ⁽¹⁾	\$ 20.7	\$ 22.1
Short-term lease	3.4	3.7
Total lease cost	\$ 24.1	\$ 25.8

(1) Operating lease cost includes an immaterial amount of variable expenses and sublease rental income.

The weighted average discount rate and the weighted average remaining lease term were 2.9% and 14.4 years, respectively, as of September 30, 2021. The weighted average discount rate and weighted average remaining lease term were 3.0% and 15.0 years, respectively, as of September 30, 2020. Operating cash flows used for operating leases for the nine months ended September 30, 2021 and 2020 were \$11.6 and \$15.4, respectively. Operating cash flows used for operating leases for the nine months ended September 30, 2021 of \$11.6 was net of \$5.0 in tenant improvement allowance receipts.

Future lease payments under non-cancelable leases as of September 30, 2021 are detailed as follows:

2021 (remaining)	\$ 4.8
2022	24.1
2023	21.0
2024	19.5
2025	18.1
Thereafter	172.3
Total lease payments	259.8
Less: imputed interest	49.5
Total operating lease liabilities	\$ 210.3

The remaining 2021 lease payment amount of \$4.8 is net of tenant improvement allowances of \$1.3. Amounts presented above do not include payments relating to immaterial leases excluded from the balance sheet as these operating leases had terms of less than twelve months.

9) Goodwill and Intangible Assets

Goodwill

The Company's methodology for allocating the purchase price relating to purchase acquisitions is determined through established and generally accepted valuation techniques. Goodwill is measured as the excess of the cost of the acquisition over the sum of the amounts assigned to tangible and identifiable intangible assets acquired less liabilities assumed. The Company assigns assets acquired (including goodwill) and liabilities assumed to one or more reporting units as of the date of acquisition. Typically acquisitions relate to a single reporting unit and thus do not require the allocation of goodwill to multiple reporting units. If the products obtained in an acquisition are assigned to multiple reporting units, the goodwill is distributed to the respective reporting units as part of the purchase price allocation process.

Goodwill and purchased intangible assets with indefinite useful lives are not amortized but are reviewed for impairment annually during the fourth quarter of each fiscal year and whenever events or changes in circumstances indicate that the carrying value of an asset may not be recoverable. The process of evaluating the potential impairment of goodwill and intangible assets requires significant judgment. The Company regularly monitors current business conditions and other factors including, but not limited to, adverse industry or economic trends, restructuring actions and lower projections of profitability that may impact future operating results.

The changes in the carrying amount of goodwill and accumulated impairment loss during the nine months ended September 30, 2021 and year ended December 31, 2020 were as follows:

	Nine Months Ended September 30, 2021			Twelve Months Ended December 31, 2020		
	Gross Carrying Amount	Accumulated Impairment Loss	Net	Gross Carrying Amount	Accumulated Impairment Loss	Net
Beginning balance at January 1	\$ 1,211.8	\$ (145.4)	\$ 1,066.4	\$ 1,202.8	\$ (144.3)	\$ 1,058.5
Acquired goodwill ⁽¹⁾	168.2	—	168.2	—	—	—
Impairment of goodwill ⁽²⁾	—	—	—	—	(1.1)	(1.1)
Foreign currency translation	(8.4)	—	(8.4)	9.0	—	9.0
Ending balance at September 30, 2021 and December 31, 2020	\$ 1,371.6	\$ (145.4)	\$ 1,226.2	\$ 1,211.8	\$ (145.4)	\$ 1,066.4

(1) During the nine months ended September 30, 2021, the Company recorded goodwill related to the acquisition of Photon Control.

(2) During the twelve months ended December 31, 2020, the Company recorded \$1.1 of goodwill impairment charges related to the pending closure of a facility in Europe.

Intangible Assets

Components of the Company's intangible assets are comprised of the following:

As of September 30, 2021:	Gross	Accumulated Impairment Charges	Accumulated Amortization	Foreign Currency Translation	Net
Completed technology ⁽¹⁾	\$ 556.4	\$ (0.1)	\$ (232.2)	\$ (2.4)	\$ 321.7
Customer relationships ⁽¹⁾	317.6	(1.4)	(119.6)	0.1	196.7
Patents, trademarks, trade names and other ⁽¹⁾	122.5	—	(51.5)	0.1	71.1
	\$ 996.5	\$ (1.5)	\$ (403.3)	\$ (2.2)	\$ 589.5

(1) During the three months ended September 30, 2021, the Company recorded \$121.0 of separately identified intangible assets related to the acquisition of Photon Control, of which \$110.0 was completed technology, \$9.4 was customer relationships and \$1.6 was patents, trademarks, trade names and other.

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

<u>As of December 31, 2020:</u>	Gross	Accumulated Impairment Charges	Accumulated Amortization	Foreign Currency Translation	Net
Completed technology	\$ 446.4	\$ (0.1)	\$ (209.8)	\$ (0.1)	\$ 236.4
Customer relationships	308.2	(1.4)	(104.8)	1.7	203.7
Patents, trademarks, trade names and other	120.9	—	(48.6)	(0.2)	72.1
	<u>\$ 875.5</u>	<u>\$ (1.5)</u>	<u>\$ (363.2)</u>	<u>\$ 1.4</u>	<u>\$ 512.2</u>

Aggregate amortization expense related to acquired intangible assets for the nine months ended September 30, 2021 and 2020 was \$40.1 and \$42.6, respectively. Aggregate net amortization expense related to acquired intangible assets for future years is as follows:

<u>Year</u>	<u>Amount</u>
2021 (remaining)	\$ 15.2
2022	59.7
2023	58.2
2024	57.3
2025	56.4
2026	52.8
Thereafter	234.0

The Company excluded \$55.9 of indefinite-lived trademarks and trade names that were not subject to amortization from the table above.

10) Debt

The Company's outstanding debt is as follows:

	<u>September 30, 2021</u>	<u>December 31, 2020</u>
Short-term debt:		
Term Loan Facility	\$ 9.0	\$ 9.0
Japanese lines of credit and financing facility	—	5.5
	<u>\$ 9.0</u>	<u>\$ 14.5</u>
Long-term debt:		
Term Loan Facility, net ⁽¹⁾	<u>\$ 809.7</u>	<u>\$ 815.0</u>

(1) Net of deferred financing fees, original issuance discount and repricing fees in the aggregate of \$8.0 and \$9.4 as of September 30, 2021 and December 31, 2020, respectively.

The Company recognized interest expense of \$6.3 and \$19.1 for the three and nine months ended September 30, 2021, respectively, and \$6.6 and \$22.7 for the three and nine months ended September 30, 2020, respectively.

Senior Secured Term Loan Credit Facility

In connection with the completion of the acquisition of Newport Corporation ("Newport") in 2016 (the "Newport Merger"), the Company entered into a term loan credit agreement (as amended, the "Term Loan Credit Agreement") with Barclays Bank PLC, as administrative agent and collateral agent, and the lenders from time to time party thereto, which provided a senior secured term loan credit facility (the "Term Loan Facility") in the original principal amount of \$780.0. The Company

has entered into seven amendments to the Term Loan Credit Agreement since 2016, including most recently the May Term Loan Amendment (as defined below). The Term Loan Facility is subject to increase at the Company's option and subject to receipt of lender commitments in accordance with the Term Loan Credit Agreement. The maturity date of the Term Loan Facility is February 2, 2026. As of September 30, 2021, borrowings under the Term Loan Facility bear interest per annum at one of the following rates selected by the Company: (a) a base rate determined by reference to the highest of (1) the federal funds effective rate plus 0.50%, (2) the "prime rate" quoted in *The Wall Street Journal*, (3) a LIBOR rate determined by reference to the costs of funds for U.S. dollar deposits for an interest period of one month adjusted for certain additional costs, plus 1.00%, and (4) a floor of 1.00%, plus, in each case, an applicable margin of 0.75%; or (b) a LIBOR rate determined by reference to the costs of funds for U.S. dollar deposits for the interest period relevant to such borrowing adjusted for certain additional costs, subject to a LIBOR rate floor of 0.0%, plus an applicable margin of 1.75%. The Company has elected the interest rate as described in clause (b) of the foregoing sentence. The Term Loan Credit Agreement provides that, unless an alternate rate of interest is agreed, all loans will be determined by reference to the base rate if the LIBOR rate cannot be ascertained, if regulators impose material restrictions on the authority of a lender to make LIBOR rate loans, or for other reasons.

In May 2021, the Company entered into an amendment (the "May Term Loan Amendment") to the Term Loan Credit Agreement. The May Term Loan Amendment amends the Term Loan Facility to, among other things, (i) increase the Company's ability to incur additional incremental debt facilities to (x) the greater of (1) \$600.0 and (2) 100% of consolidated EBITDA, plus (y) an amount equal to the sum of all voluntary prepayments of term loans under the Term Loan Facility, plus (z) an additional unlimited amount subject to pro forma compliance with a secured leverage ratio test of 3.25:1.00, and (ii) increase the Company's flexibility under certain debt, lien, investment, restricted payment and disposition baskets. The fees incurred, including certain customary lender consent fees, in connection with the May Term Loan Amendment were immaterial.

As of September 30, 2021, the Company has incurred an aggregate amount of \$42.6 of deferred finance fees, original issue discount and repricing fees related to the term loans under the Term Loan Facility, which are included in long-term debt in the accompanying condensed consolidated balance sheets and are being amortized to interest expense over the estimated life of the term loans using the effective interest method. As of September 30, 2021, the remaining balance of deferred finance fees, original issue discount and repricing fees related to the term loans under the Term Loan Facility was \$8.0. A portion of the deferred finance fees, original issue discount and repricing fees have been accelerated in connection with the various debt prepayments and amendments between 2016 and 2021.

The Company is required to make scheduled quarterly amortization payments each equal to 0.25% of the original principal amount of the Term Loan Facility.

As of September 30, 2021, after giving effect to all amendments and repayments prior to such date, the outstanding principal amount of the Term Loan Facility was \$826.7, and the interest rate was 1.8%.

Under the Term Loan Credit Agreement, the Company is required to prepay outstanding term loans, subject to certain exceptions, with portions of its annual excess cash flow as well as with the net cash proceeds of certain of its asset sales, certain casualty and condemnation events and the incurrence or issuance of certain debt.

All obligations under the Term Loan Facility are guaranteed by certain of the Company's domestic subsidiaries and are secured by substantially all of the Company's assets and the assets of such subsidiaries, subject to certain exceptions and exclusions.

The Term Loan Credit Agreement contains customary representations and warranties, affirmative and negative covenants and provisions relating to events of default. If an event of default occurs, the lenders under the Term Loan Facility will be entitled to take various actions, including the acceleration of amounts due under the Term Loan Facility and all actions generally permitted to be taken by a secured creditor. At September 30, 2021, the Company was in compliance with all covenants under the Term Loan Credit Agreement.

Interest Rate Swap Agreements

The Company entered into various interest rate swap agreements as described further in Note 6 that exchange the variable LIBOR interest rate to a fixed rate in order to manage the exposure to interest rate fluctuations associated with the variable LIBOR interest rate paid on the outstanding balance of the Term Loan Facility.

Senior Secured Asset-Based Revolving Credit Facility

In February 2019, in connection with the completion of the acquisition of Electro Scientific Industries, Inc. (the “ESI Merger”), the Company entered into an asset-based revolving credit agreement with Barclays Bank PLC, as administrative agent and collateral agent, the other borrowers from time to time party thereto, and the lenders and letters of credit issuers from time to time party thereto (the “ABL Credit Agreement”), that provides a senior secured asset-based revolving credit facility of up to \$100.0, subject to a borrowing base limitation (the “ABL Facility”). The Company has entered into two amendments to the ABL Credit Agreement since 2019. As of September 30, 2021, after giving effect to all amendments, the borrowing base for the ABL Facility at any time equals the sum of: (a) 85% of certain eligible accounts; plus (b) prior to certain notice and field examination and appraisal requirements, the lesser of (i) 20% of net book value of eligible inventory in the United States and (ii) 30% of the borrowing base, and after the satisfaction of such requirements, the lesser of (i) the lesser of (A) 65% of the lower of cost or market value of certain eligible inventory and (B) 85% of the net orderly liquidation value of certain eligible inventory and (ii) 30% of the borrowing base; minus (c) reserves established by the administrative agent, in each case, subject to additional limitations and examination requirements for eligible accounts and eligible inventory acquired in an acquisition after February 1, 2019. The ABL Facility includes borrowing capacity in the form of letters of credit up to \$25.0. The Company has not borrowed against the ABL Facility to date.

As of September 30, 2021, borrowings under the ABL Facility bear interest at a rate per annum equal to, at the Company’s option, any of the following, plus, in each case, an applicable margin: (a) a base rate determined by reference to the highest of (1) the federal funds effective rate plus 0.50%, (2) the “prime rate” quoted in *The Wall Street Journal*, (3) a LIBOR rate determined by reference to the costs of funds for U.S. dollar deposits for an interest period of one month adjusted for certain additional costs, plus 1.00% and (4) a floor of 0.00%, plus, in each case, an applicable margin ranging from 0.25% to 0.50%; and (b) a LIBOR rate determined by reference to the costs of funds for U.S. dollar deposits for the interest period relevant to such borrowing adjusted for certain additional costs, with a floor of 0.00%, plus, in each case, an applicable margin ranging from 1.25% to 1.50%. The applicable margin for borrowings thereunder is subject to upward or downward adjustment each fiscal quarter, based on the average historical excess availability during the preceding quarter.

In addition to paying interest on any outstanding principal under the ABL Facility, the Company is required to pay a commitment fee in respect of the unutilized commitments thereunder equal to 0.25% per annum. The Company must also pay customary letter of credit fees and agency fees.

Under the ABL Facility, the Company is required to prepay amounts outstanding under the ABL Facility (1) if amounts outstanding under the ABL Facility exceed the lesser of (a) the commitment amount and (b) the borrowing base, in an amount required to reduce such shortfall, (2) if amounts outstanding under the ABL Facility in any currency other than U.S. dollars exceed the sublimit for such currency, in an amount required to reduce such shortfall, and (3) during any period in which the Company has excess availability less than the greater of (a) 10.0% of the lesser of (x) the commitment amount and (y) the borrowing base (the “Line Cap”) and (b) \$8.5 for 3 consecutive business days, until the time when the Company has excess availability equal to or greater than the greater of (A) 10.0% of the Line Cap and (B) \$8.5 for 30 consecutive days, or during the continuance of an event of default, with immediately available funds in its blocked accounts.

There is no scheduled amortization under the ABL Facility. Any principal amount outstanding under the ABL Facility is due and payable in full on the fifth anniversary of the closing date, subject to a springing maturity in the event that term loans under the Term Loan Facility in an aggregate amount of at least \$100.0 have an earlier maturity date than the ABL Facility.

All obligations under the ABL Facility are guaranteed by certain of the Company’s domestic subsidiaries and are secured by substantially all of the Company’s assets and the assets of such subsidiaries, subject to certain exceptions and exclusions.

From the time when the Company has excess availability less than the greater of (a) 10.0% of the Line Cap and (b) \$8.5 until the time when the Company has excess availability equal to or greater than the greater of (a) 10.0% of the Line Cap and (b) \$8.5 for 30 consecutive days, or during the continuance of an event of default, the ABL Credit Agreement requires the Company to maintain a fixed charge coverage ratio, tested on the last day of each fiscal quarter, of at least 1.0 to 1.0.

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

The ABL Credit Agreement also contains customary representations and warranties, affirmative covenants and provisions relating to events of default. If an event of default occurs, the lenders under the ABL Facility will be entitled to take various actions, including the acceleration of amounts due under the ABL Facility and all actions permitted to be taken by a secured creditor.

Lines of Credit and Borrowing Arrangements

The Company's Japanese subsidiaries have lines of credit and a financing facility with various financial institutions, many of which generally expire and are renewed at three-month intervals with the remaining having no expiration date. The lines of credit and financing facility provided for aggregate borrowings as of September 30, 2021 of up to an equivalent of \$29.9. There were no borrowings outstanding under these arrangements at September 30, 2021. Total borrowings outstanding under these arrangements were \$5.5 at December 31, 2020.

Contractual maturities of the Company's debt obligations as of September 30, 2021 are as follows:

<u>Year</u>	<u>Amount</u>
2021 (remaining)	\$ 2.2
2022	9.0
2023	9.0
2024	9.0
2025	9.0
2026	788.5

11) Product Warranties

The Company provides for the estimated costs to fulfill customer warranty obligations upon the recognition of the related revenue. While the Company engages in extensive product quality programs and processes, including actively monitoring and evaluating the quality of its component suppliers, the Company's warranty obligations are affected by shipment volume, product failure rates, utilization levels, material usage and supplier warranties on parts delivered to the Company. Should actual product failure rates, utilization levels, material usage, or supplier warranties on parts differ from the Company's estimates, revisions to the estimated warranty liability would be required.

Product warranty activities were as follows:

	<u>Nine Months Ended September 30,</u>	
	<u>2021</u>	<u>2020</u>
Beginning of period	\$ 18.4	\$ 14.9
Provision for product warranties	30.4	20.2
Charges to warranty liability	(26.0)	(19.0)
End of period ⁽¹⁾	<u>\$ 22.8</u>	<u>\$ 16.1</u>

(1) As of September 30, 2021, short-term product warranties of \$21.7 and long-term product warranties of \$1.1 were included within other current liabilities and other non-current liabilities, respectively, within the accompanying condensed consolidated balance sheet. As of September 30, 2020, short-term product warranties of \$13.0 and long-term product warranties of \$3.1 were included within other current liabilities and other non-current liabilities, respectively, within the accompanying condensed consolidated balance sheet.

12) Income Taxes

The Company's effective tax rates for the three and nine months ended September 30, 2021 were 20.4% and 17.6%, respectively. The effective tax rates for the three and nine months ended September 30, 2021 and related income tax expense, were lower than the U.S. statutory tax rate mainly due to the U.S. deduction for foreign derived intangible income, windfall benefits from stock compensation, and the geographic mix of income earned by the Company's international subsidiaries being taxed at rates lower than the U.S. statutory tax rate, offset by the U.S. global intangible low-taxed income inclusion and additional withholding taxes on inter-company distributions due to the United Kingdom's withdrawal from the European Union.

The Company's effective tax rates for the three and nine months ended September 30, 2020 were 15.7% and 17.0%, respectively. The effective tax rates for the three and nine months ended September 30, 2020, and related income tax

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

expense, were lower than the U.S. statutory tax rate mainly due to the geographic mix of income earned by the Company's international subsidiaries being taxed at rates lower than the U.S. statutory tax rate, benefits of stock compensation, and the U.S. deduction for foreign derived intangible income offset by the U.S. tax effects of the U.S. global intangible low-taxed income inclusion and the write-off of deferred tax assets related to certain foreign net operating losses.

As of September 30, 2021 and December 31, 2020, the total amount of gross unrecognized tax benefits, which excludes interest and penalties, was \$47.3 and \$47.0, respectively. The Company accrues interest expense, and if applicable, penalties, for any uncertain tax positions. Interest and penalties are classified as a component of income tax expense. As of September 30, 2021 and December 31, 2020, the Company had accrued interest on unrecognized tax benefits of approximately \$0.9 and \$0.7, respectively.

Over the next 12 months it is reasonably possible that the Company may recognize approximately \$3.8 of previously net unrecognized tax benefits, excluding interest and penalties, related to various U.S. federal and foreign tax positions, primarily as a result of the expiration of certain statutes of limitations.

The Company and its subsidiaries are subject to examination by U.S. federal, state and foreign tax authorities. The U.S. federal statute of limitations remains open for tax years 2017 through the present. The statute of limitations for the Company's tax filings in other jurisdictions varies between fiscal years 2015 through present. The Company has certain federal credit carryforwards and state tax loss and credit carryforwards that are open to examination for tax years 2000 through the present.

13) Net Income Per Share

The following table sets forth the computation of basic and diluted net income per share:

	<u>Three Months Ended September 30,</u>		<u>Nine Months Ended September 30,</u>	
	2021	2020	2021	2020
Numerator:				
Net income	\$ 132.4	\$ 91.7	\$ 401.2	\$ 234.5
Denominator:				
Shares used in net income per common share – basic	55.5	55.2	55.4	55.1
Effect of dilutive securities:				
Restricted stock units and stock appreciation rights	0.2	0.2	0.3	0.2
Shares used in net income per common share – diluted	55.7	55.4	55.7	55.3
Net income per common share:				
Basic	\$ 2.39	\$ 1.66	\$ 7.24	\$ 4.26
Diluted	\$ 2.38	\$ 1.66	\$ 7.21	\$ 4.24

Basic earnings per share ("EPS") is computed by dividing income available to common stockholders by the weighted-average number of common shares outstanding during the period. The computation of diluted EPS is similar to the computation of basic EPS except that the denominator is increased to include the number of additional common shares that would have been outstanding (using the treasury stock method) if securities containing potentially dilutive common shares (restricted stock units ("RSUs") and stock appreciation rights ("SARs")) had been converted to such common shares, and if such assumed conversion is dilutive.

For the three and nine months ended September 30, 2021, there were 0.1 weighted-average restricted stock units that would have had an anti-dilutive effect on EPS and were excluded from the computation of diluted weighted-average shares. For the three and nine months ended September 30, 2020, there were no weighted-average restricted stock units that had an anti-dilutive effect on EPS and were excluded from the computation of diluted weighted-average shares.

14) Stock-Based Compensation

The Company grants RSUs to employees and directors under the 2014 Stock Incentive Plan (the “2014 Plan”). The 2014 Plan is administered by the Compensation Committee of the Company’s Board of Directors. The 2014 Plan is intended to attract and retain employees and directors, and to provide an incentive for these individuals to assist the Company to achieve long-range performance goals and to enable these individuals to participate in the long-term growth of the Company.

The total stock-based compensation expense included in the Company’s condensed consolidated statements of operations and comprehensive income was as follows:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Cost of revenues	\$ 0.9	\$ 1.2	\$ 2.8	\$ 3.1
Research and development	1.1	1.0	3.3	3.0
Selling, general and administrative	6.9	5.1	21.7	15.9
Acquisition and integration costs	—	0.1	—	0.7
Total pre-tax stock-based compensation expense	\$ 8.9	\$ 7.4	\$ 27.8	\$ 22.7

At September 30, 2021, the total compensation expense related to unvested stock-based awards granted to employees and directors under the 2014 Plan that had not been recognized was \$43.5. The Company determines the fair value of RSUs based on the closing market price of the Company’s common stock on the date of the award and estimates the fair value of SARs and employee stock purchase plan rights using the Black-Scholes valuation model. Such values are recognized as expense on a straight-line basis for time-based awards and using the accelerated graded vesting method for performance-based awards, both over the requisite service periods.

The following table presents the activity for RSUs under the 2014 Plan:

	Nine Months Ended September 30, 2021	
	Outstanding RSUs	Weighted Average Grant Date Fair Value
RSUs – beginning of period	0.6	\$ 93.26
Granted	0.2	\$ 177.91
Vested	(0.3)	\$ 95.47
RSUs – end of period	<u>0.5</u>	<u>\$ 127.31</u>

The Company had an immaterial amount of SARs outstanding as of September 30, 2021 and December 31, 2020.

15) Stockholders’ Equity

Share Repurchase Program

On July 25, 2011, the Company’s Board of Directors approved a share repurchase program for the repurchase of up to an aggregate of \$200 of its outstanding common stock from time to time in open market purchases, privately negotiated transactions or through other appropriate means. The timing and quantity of any shares repurchased depends upon a variety of factors, including business conditions, stock market conditions and business development activities, including, but not limited to, merger and acquisition opportunities. These repurchases may be commenced, suspended or discontinued at any time without prior notice. The Company has repurchased approximately 2.6 shares of common stock for approximately \$127 pursuant to the program since its adoption. During the three and nine months ended September 30, 2021 and 2020, there were no repurchases of common stock.

Cash Dividends

Holders of the Company’s common stock are entitled to receive dividends when they are declared by the Company’s Board of Directors. In addition, the Company accrues dividend equivalents on the RSUs the Company assumed in the ESI Merger when dividends are declared by the Company’s Board of Directors. During the first quarter of 2021, the Company’s Board of Directors declared a cash dividend of \$0.20 per share. During each of the second and third quarters of 2021, the Company’s Board of Directors declared a cash dividend of \$0.22 per share. The total amount of the dividends declared in 2021 was

\$35.5, or \$0.64 per share. During each of the first, second and third quarters of 2020, the Company’s Board of Directors declared a cash dividend of \$0.20 per share, which totaled \$33.0, or \$0.60 per share.

On October 25, 2021, the Company’s Board of Directors declared a quarterly cash dividend of \$0.22 per share to be paid on December 10, 2021 to stockholders of record as of November 29, 2021.

Future dividend declarations, if any, as well as the record and payment dates for such dividends, are subject to the final determination of the Company’s Board of Directors. In addition, under the Term Loan Facility and ABL Facility, the Company may be restricted from paying dividends under certain circumstances.

16) Acquisition

Photon Control

On July 15, 2021, the Company completed its acquisition of Photon Control (the “Photon Control Acquisition”), pursuant to a definitive agreement (the “Arrangement Agreement”). Photon Control designs, manufactures and distributes a wide range of optical sensors and systems to measure temperature and position used in semiconductor wafer fabrication. At the effective time of the Photon Control Acquisition and pursuant to the terms and conditions of the Arrangement Agreement, each share of Photon Control’s common stock issued and outstanding as of immediately prior to the effective time of the Photon Control Acquisition, was converted into the right to receive CAD 3.60 per share in cash, without interest and subject to deduction for any required withholding tax. The Company paid to the former Photon Control securityholders aggregate consideration of CAD 378.6, or USD 302.7, excluding related transaction fees and expenses. The Company funded the payment of the aggregate consideration with available cash on hand. Photon Control is included in the Company’s Light & Motion segment.

The purchase price of Photon Control consisted of the following:

Cash paid for outstanding shares (1)	\$	302.7
Less: Cash and cash equivalents acquired		(34.3)
Total purchase price, net of cash and cash equivalents acquired	\$	268.4

(1) Represents cash paid of CAD 3.60 per share for approximately 105.2 shares of Photon Control common stock, without interest and subject to deduction for any required withholding tax.

Under the acquisition method of accounting, the total estimated acquisition consideration is allocated to the acquired tangible and intangible assets and assumed liabilities of Photon Control based on their fair values as of the acquisition date. Any excess of the acquisition consideration over the fair value of assets acquired and liabilities assumed is allocated to goodwill. The Company expects that none of this goodwill or intangible assets will be deductible for tax purposes. The Company believes the amount of goodwill relative to identifiable intangible assets relates to enhancing the Company’s *Surround the Chamber*® portfolio by adding optical sensors for temperature control for critical etch and deposition applications in semiconductor wafer fabrication.

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

The following table summarizes the preliminary allocation of the purchase price to the fair values assigned to assets acquired and liabilities assumed at the date of the Photon Control Acquisition:

Current assets	\$	51.4
Intangible assets		121.0
Goodwill		168.2
Other non-current assets		8.6
Total assets acquired		349.2
Current liabilities		13.7
Non-current deferred taxes		32.1
Other long-term liabilities		0.7
Total liabilities assumed		46.5
Fair value of assets acquired and liabilities assumed		302.7
Less: Cash and cash equivalents acquired		(34.3)
Total purchase price, net of cash and cash equivalents acquired	\$	268.4

The acquired intangible assets are being amortized on a straight-line basis, which approximates the economic use of the assets over their estimated useful lives.

The following table reflects the allocation of the acquired intangible assets and related estimate of useful lives:

Completed technology	\$	110.0	9 years
Customer relationships	\$	9.4	10 years
Trade names		0.2	0.5 years
Backlog		1.4	1.5 years
	\$	121.0	

While the Company uses its best estimates and assumptions as part of the purchase price allocation process to value the assets acquired and liabilities assumed on the acquisition date, its estimates and assumptions are subject to refinement. The net fair value of the acquired intangible assets was determined using the income approach. In performing these valuations, the key underlying judgments and assumptions used included the appropriate discount rates as well as forecasted revenue growth rates, gross profit and operating margins. Fair value estimates are based on a complex series of judgments about future events and uncertainties and rely heavily on estimates and assumptions. The judgments used to determine the estimated fair value assigned to each class of assets acquired and liabilities assumed, as well as asset lives, can materially impact the Company's results of operations. The finalization of the purchase accounting assessment may result in a change in the valuation of assets acquired and liabilities assumed and may have a material impact on the Company's results of operations and financial position. As a result, during the measurement period, which may be up to one year from the acquisition date, the Company records adjustments to the assets acquired and liabilities assumed with a corresponding offset to goodwill to reflect additional information received about facts and circumstances which existed at the date of acquisition. The Company records adjustments to the assets acquired and liabilities assumed subsequent to the purchase price allocation period in the Company's operating results in the period in which the adjustments are determined. Any potential adjustments made could be material in relation to the preliminary values presented.

The results of operations of the Photon Control business from the acquisition closing date of July 15, 2021 through September 30, 2021, were not material to the Company's results of operations. The acquisition was also not material to the Company's results of operations, for the periods presented, on a pro forma basis.

17) Business Segment, Geographic Area, and Significant Customer Information

The Company is a global provider of instruments, systems, subsystems and process control solutions that measure, monitor, deliver, analyze, power and control critical parameters of advanced manufacturing processes to improve process performance and productivity for its customers. The Company's products are derived from its core competencies in pressure measurement

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

and control, flow measurement and control, gas and vapor delivery, gas composition analysis, electronic control technology, reactive gas generation and delivery, power generation and delivery, vacuum technology, temperature sensing, lasers, photonics, optics, precision motion control, vibration control and laser-based manufacturing systems solutions. The Company also provides services relating to the maintenance and repair of its products, installation services and training. The Company's primary served markets include semiconductor, industrial technologies, life and health sciences, and research and defense.

The Company's Chief Operating Decision Maker ("CODM"), which is the Company's Chief Executive Officer, utilizes financial information to make decisions about allocating resources and assessing performance for the entire Company, which is used in the decision-making process to assess performance.

Reportable Segments

The Vacuum & Analysis segment provides a broad range of instruments, components and subsystems which are derived from the Company's core competencies in pressure measurement and control, flow measurement and control, gas and vapor delivery, gas composition analysis, electronic control technology, reactive gas generation and delivery, power generation and delivery and vacuum technology.

The Light & Motion segment provides a broad range of instruments, components and subsystems which are derived from the Company's core competencies in temperature sensing, lasers, photonics, optics, precision motion control and vibration control.

The Equipment & Solutions segment provides a range of products including laser-based systems for printed circuit board ("PCB") manufacturing, which includes flexible interconnect PCB processing systems and high density interconnect solutions for rigid PCB manufacturing and substrate processing and multi-layer ceramic capacitor test systems.

The Company derives its segment results directly from the manner in which results are reported in its management reporting system. The accounting policies that the Company uses to derive reportable segment results are substantially the same as those used for external reporting purposes. The Company groups its similar products within its three reportable segments.

The following table sets forth net revenues by reportable segment:

	<u>Three Months Ended September 30,</u>		<u>Nine Months Ended September 30,</u>	
	2021	2020	2021	2020
Vacuum & Analysis	\$ 483.1	\$ 361.3	\$ 1,376.6	\$ 995.1
Light & Motion	208.7	175.9	583.6	507.3
Equipment & Solutions	50.1	52.6	225.5	167.4
	<u>\$ 741.9</u>	<u>\$ 589.8</u>	<u>\$ 2,185.7</u>	<u>\$ 1,669.8</u>

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

The following table sets forth a reconciliation of segment gross profit to consolidated net income:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Gross profit by reportable segment:				
Vacuum & Analysis	\$ 226.3	\$ 163.5	\$ 643.8	\$ 444.1
Light & Motion	100.6	76.0	272.6	227.8
Equipment & Solutions	21.5	22.5	109.3	76.0
Total gross profit by reportable segment	348.4	262.0	1,025.7	747.9
Operating expenses:				
Research and development	51.7	42.5	148.9	127.7
Selling, general and administrative	95.8	87.0	288.9	260.3
Acquisition and integration costs	8.6	0.5	20.8	3.4
Restructuring and other	2.0	3.1	9.9	6.8
Amortization of intangible assets	15.0	12.5	40.1	42.6
Asset impairment	—	—	—	1.2
COVID-19 related net credits	—	—	—	(1.2)
Income from operations	175.3	116.4	517.1	307.1
Interest income	0.1	0.1	0.4	1.1
Interest expense	6.3	6.6	19.1	22.7
Other expense, net	2.9	1.1	11.5	3.0
Income before income taxes	166.2	108.8	486.9	282.5
Provision for income taxes	33.8	17.1	85.7	48.0
Net income	\$ 132.4	\$ 91.7	\$ 401.2	\$ 234.5

The following table sets forth capital expenditures by reportable segment for the three and nine months ended September 30, 2021 and 2020:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Vacuum & Analysis	\$ 10.8	\$ 9.7	\$ 27.2	\$ 28.8
Light & Motion	8.3	12.9	25.0	21.4
Equipment & Solutions	1.4	6.4	11.1	9.7
Total capital expenditures	\$ 20.5	\$ 29.0	\$ 63.3	\$ 59.9

The following table sets forth depreciation and amortization by reportable segment for the three and nine months ended September 30, 2021 and 2020:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Vacuum & Analysis	\$ 5.1	\$ 5.1	\$ 17.3	\$ 15.1
Light & Motion	13.5	9.6	32.3	33.5
Equipment & Solutions	8.8	8.6	26.5	27.2
Total depreciation and amortization	\$ 27.4	\$ 23.3	\$ 76.1	\$ 75.8

Total income tax expense is not presented by reportable segment because the necessary information is not available nor used by the CODM.

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

The following table sets forth segment assets by reportable segment:

September 30, 2021	Vacuum & Analysis	Light & Motion	Equipment & Solutions	Corporate, Eliminations & Other	Total
Segment assets:					
Accounts receivable	\$ 292.2	\$ 139.1	\$ 36.7	\$ (24.6)	\$ 443.4
Inventories	317.9	170.9	64.1	(2.5)	550.4
Total segment assets	<u>\$ 610.1</u>	<u>\$ 310.0</u>	<u>\$ 100.8</u>	<u>\$ (27.1)</u>	<u>\$ 993.8</u>

December 31, 2020	Vacuum & Analysis	Light & Motion	Equipment & Solutions	Corporate, Eliminations & Other	Total
Segment assets:					
Accounts receivable	\$ 229.1	\$ 122.6	\$ 51.7	\$ (10.7)	\$ 392.7
Inventories	273.3	166.1	63.7	(1.7)	501.4
Total segment assets	<u>\$ 502.4</u>	<u>\$ 288.7</u>	<u>\$ 115.4</u>	<u>\$ (12.4)</u>	<u>\$ 894.1</u>

The following is a reconciliation of segment assets to consolidated total assets:

	September 30, 2021	December 31, 2020
Total segment assets	\$ 993.8	\$ 894.1
Cash and cash equivalents and short-term investments	879.6	836.0
Other current assets	121.5	74.3
Property, plant and equipment, net	316.8	284.3
Right-of-use assets	184.5	184.4
Goodwill and intangible assets, net	1,815.7	1,578.6
Other assets and long-term investments	54.0	52.1
Consolidated total assets	<u>\$ 4,365.9</u>	<u>\$ 3,903.8</u>

Geographic Area

Information about the Company's operations by geographic area is presented in the tables below. Net revenues from unaffiliated customers are based on the location in which the sale originated. Intercompany sales between geographic areas are at tax transfer prices and have been eliminated from consolidated net revenues.

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Net revenues:				
United States	\$ 348.4	\$ 281.2	\$ 922.7	\$ 757.7
South Korea	90.6	65.8	292.6	206.8
China	80.4	67.6	263.5	192.5
Taiwan	44.1	27.8	164.8	73.3
Japan	46.9	39.9	141.2	117.1
Other Asia	74.0	59.4	228.4	175.3
Europe	57.5	48.1	172.5	147.1
	<u>\$ 741.9</u>	<u>\$ 589.8</u>	<u>\$ 2,185.7</u>	<u>\$ 1,669.8</u>

Long-lived assets:(1)	September 30, 2021	December 31, 2020
North America	\$ 402.4	\$ 364.0
Europe	34.5	45.1
Asia	102.1	94.8
	<u>\$ 539.0</u>	<u>\$ 503.9</u>

- (1) Long-lived assets include property, plant and equipment, net, right-of-use assets, and certain other assets, and exclude goodwill, intangible assets and long-term tax-related accounts.

MKS INSTRUMENTS, INC.
NOTES TO UNAUDITED CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(in millions, except per share data)

Goodwill associated with each of the Company's reportable segments is as follows:

Reportable segment:	September 30, 2021	December 31, 2020
Vacuum & Analysis	\$ 195.2	\$ 196.2
Light & Motion	556.3	395.3
Equipment & Solutions	474.7	474.9
Total goodwill	<u>\$ 1,226.2</u>	<u>\$ 1,066.4</u>

Major Customers

The following customers represented greater than 10% of the Company's net revenues as follows:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Lam Research Corporation	18.4%	14.1%	14.6%	12.3%
Applied Materials, Inc.	10.6%	11.0%	10.7%	10.8%

18) Restructuring and Other

Restructuring

The Company recorded restructuring charges of \$1.0 and \$5.9 during the three and nine months ended September 30, 2021, respectively, primarily related to severance costs due to a global cost saving initiative, costs related to the pending closure of two facilities in Europe and movement of certain products to low cost regions.

The Company recorded restructuring charges of \$0.4 and \$2.0 during the three and nine months ended September 30, 2020, respectively, primarily related to the closure of a facility in Europe and costs related to the exit of certain product groups.

Restructuring activities were as follows:

	Nine Months Ended September 30,	
	2021	2020
Beginning of period	\$ 0.3	\$ 3.7
Charged to expense	5.9	2.0
Payments and adjustments	(5.8)	(4.4)
End of period	<u>\$ 0.4</u>	<u>\$ 1.3</u>

Other

The Company recorded charges of \$1.0 and \$4.0 during the three and nine months ended September 30, 2021, respectively, related primarily to duplicate facility costs. The Company recorded charges of \$2.7 and \$5.4 during the three and nine months ended September 30, 2020, respectively, related to duplicate facility costs.

The Company received an insurance reimbursement of \$0.5 during the nine months ended September 30, 2020 for costs recorded on a legal settlement from a contractual obligation assumed as part of the Newport Merger.

19) Commitments and Contingencies

In 2016, two putative class actions lawsuit captioned Dixon Chung v. Newport Corp., et al., Case No. A-16-733154-C, and Hubert C. Pincon v. Newport Corp., et al., Case No. A-16-734039-B, were filed in the District Court, Clark County, Nevada on behalf of a putative class of stockholders of Newport for claims related to the merger agreement (“Newport Merger Agreement”) between the Company, Newport, and a wholly-owned subsidiary of the Company (“Merger Sub”). The lawsuits named as defendants the Company, Newport, Merger Sub, and certain then current and former members of Newport’s board of directors. Both complaints alleged that Newport directors breached their fiduciary duties to Newport’s stockholders by agreeing to sell Newport through an inadequate and unfair process, which led to inadequate and unfair consideration, by agreeing to unfair deal protection devices and by omitting material information from the proxy statement. The complaints also alleged that the Company, Newport and Merger Sub aided and abetted the directors’ alleged breaches of their fiduciary duties. The District Court consolidated the actions, and plaintiffs later filed an amended complaint captioned In re Newport Corporation Shareholder Litigation, Case No. A-16-733154-B, in the District Court, Clark County, Nevada, on behalf of a putative class of Newport’s stockholders for claims related to the Newport Merger Agreement. The amended complaint alleged Newport’s former board of directors breached their fiduciary duties to Newport’s stockholders and that the Company, Newport and Merger Sub had aided and abetted these breaches and sought monetary damages, including pre- and post-judgment interest. In June 2017, the District Court granted defendants’ motion to dismiss and dismissed the amended complaint against all defendants but granted plaintiffs leave to amend.

On July 27, 2017, plaintiffs filed a second amended complaint containing substantially similar allegations but naming only Newport’s former directors as defendants. On August 8, 2017, the District Court dismissed the Company and Newport from the action. The second amended complaint seeks monetary damages, including pre- and post-judgment interest. The District Court granted a motion for class certification on September 27, 2018, appointing Mr. Pincon and Locals 302 and 612 of the International Union of Operating Engineers - Employers Construction Industry Retirement Trust as class representatives. On June 11, 2018, plaintiff Dixon Chung was voluntarily dismissed from the litigation. On August 9, 2019, plaintiffs filed a motion for leave to file a third amended complaint, which was denied on October 10, 2019. On August 23, 2019, defendants filed a motion for summary judgment. On January 23, 2020, the District Court entered its findings of fact, conclusions of law, and order granting defendants’ motion for summary judgment. On February 18, 2020, plaintiffs filed a notice of appeal from the District Court’s order granting defendants’ motion for summary judgment, as well as from the District Court’s prior orders granting defendants’ motion for a bench trial and denying plaintiffs’ motion for leave to file an amended complaint. On November 30, 2020, plaintiffs filed their opening brief in the Nevada Supreme Court in support of their appeal from the District Court’s orders. On January 29, 2021, defendants filed their answering brief, and on March 30, 2021, plaintiffs filed their reply brief. The Nevada Supreme Court has scheduled oral argument for December 15, 2021.

The Company is also subject to various legal proceedings and claims that have arisen in the ordinary course of business. In the opinion of management, the ultimate disposition of these matters, and the matters noted above, will not have a material adverse effect on the Company’s results of operations, financial condition or cash flows.

20) Subsequent Events and Pending Acquisition

On July 1, 2021, the Company entered into a definitive agreement (as amended from time to time, the “Implementation Agreement”) to acquire Atotech Limited (“Atotech”), a leading process chemicals technology company and a market leader in advanced electroplating solutions. Pursuant to the Implementation Agreement, the Company agreed to pay \$16.20 per share in cash and 0.0552 of a share of MKS common stock for each outstanding common share of Atotech, for total cash and stock consideration of approximately \$5,100. The acquisition is expected to close by the end of 2021, subject to the satisfaction of certain closing conditions, including receipt of required regulatory approvals, approval by the Royal Court of Jersey and approval by Atotech’s shareholders. The Company’s obligations to complete the acquisition are not subject to any financing condition. The Company intends to fund the cash portion of the transaction with a combination of available cash on hand and committed term loan debt financing. In connection with entering into the Implementation Agreement, the Company entered into (a) a commitment letter (the “Initial Commitment Letter”), dated as of July 1, 2021, with JPMorgan Chase Bank, N.A. and Barclays Bank PLC (collectively, the “Initial Commitment Parties”) and (b) joinders to the Initial Commitment Letter to add certain additional lender parties (the “Commitment Letter Joinders” and, together with the Initial Commitment Letter, the “Commitment Letter”) dated as of July 23, 2021, with the Initial Commitment Parties and the additional lenders party thereto (collectively, the “Supplemental Commitment Parties” and, together with the Initial Commitment Parties, the “Commitment Parties”), pursuant to which, subject to the terms and conditions set forth therein, the Commitment Parties committed to provide (i) a senior secured term loan credit facility in an aggregate principal amount of \$5,300 (the “New Term Loan Facility”) and (ii) a senior secured revolving credit facility with aggregate total commitments of \$500 (the “New Revolving Credit Facility”). The New Term Loan Facility and New Revolving Credit Facility would

refinance the Term Loan Facility and ABL Facility, respectively, and the New Term Loan Facility would be used to finance a portion of the acquisition and to refinance certain existing indebtedness of Atotech.

On October 22, 2021, the Company completed the syndication of the New Term Loan Facility, comprised of two tranches: a USD 4,700 loan at LIBOR plus 2.25%, a floor of 0.50% and 0.25% of original issue discount, and a Euro tranche of EUR 500 (approximately USD 600) at EURIBOR plus 2.75%, a floor of 0.00% and 0.25% of original issue discount. The proceeds from the anticipated New Term Loan Facility will be used to finance a portion of the acquisition of Atotech and to repay the existing Term Loan Facility and certain existing indebtedness of Atotech.

The Commitment Parties' obligations under the Commitment Letter and the closing and initial funding under the New Term Loan Facility are subject to certain customary conditions including, without limitation, the consummation of the acquisition of Atotech in accordance with the Implementation Agreement, the accuracy of specified representations and warranties of the Company and other customary closing conditions.

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

This Quarterly Report on Form 10-Q contains “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995, Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934 regarding the future financial performance, business prospects and growth of MKS. These statements are only predictions based on current assumptions and expectations. Any statements that are not statements of historical fact (including statements containing the words “will,” “projects,” “intends,” “believes,” “plans,” “anticipates,” “expects,” “estimates,” “forecasts,” “continues” and similar expressions) should be considered to be forward-looking statements. Actual events or results may differ materially from those in the forward-looking statements set forth herein.

Among the important factors that could cause actual events to differ materially from those in the forward-looking statements are manufacturing and sourcing risks, including the impact and duration of supply chain disruptions and component shortages, the ability of MKS to complete its acquisition of Atotech Limited (“Atotech”), the terms of MKS’ existing term loan, the terms and availability of financing for the Atotech acquisition, the substantial indebtedness MKS expects to incur in connection with the Atotech acquisition and the need to generate sufficient cash flows to service and repay such debt, MKS’ entry into Atotech’s chemicals technology business, in which MKS does not have experience and which may expose it to significant additional liabilities, the risk of litigation relating to the Atotech acquisition, the risk that disruption from the Atotech acquisition materially and adversely affects the respective businesses and operations of MKS and Atotech, the ability of MKS to realize the anticipated synergies, cost savings and other benefits of the Atotech acquisition, competition from larger or more established companies in MKS’ and Atotech’s respective markets, the ability of MKS to successfully grow its business and the businesses of Atotech, Photon Control Inc. (“Photon Control”), which it acquired in July 2021, and Electro Scientific Industries, Inc. (“ESI”), which it acquired in February 2019, potential adverse reactions or changes to business relationships resulting from the announcement, pendency or completion of the Atotech acquisition, conditions affecting the markets in which MKS and Atotech operate, including the fluctuations in capital spending in the semiconductor industry and other advanced manufacturing markets, and fluctuations in sales to MKS’ and Atotech’s major customers, the ability to anticipate and meet customer demand, the challenges, risks and costs involved with integrating the operations of the companies we have acquired, potential fluctuations in quarterly results, dependence on new product development, rapid technological and market change, acquisition strategy, volatility of stock price, international operations, financial risk management, and the other factors described in MKS’ Annual Report on Form 10-K for the year ended December 31, 2020 and any subsequent Quarterly Reports on Form 10-Q, as filed with the U.S. Securities and Exchange Commission (the “SEC”). MKS is under no obligation to, and expressly disclaims any obligation to, update or alter these forward-looking statements, whether as a result of new information, future events or otherwise after the date of this report.

The Management’s Discussion and Analysis of Financial Condition and Results of Operations, or MD&A, describes principal factors affecting the results of our operations, financial condition and liquidity, as well as our critical accounting policies and estimates that require significant judgment and thus have the most significant potential impact on our consolidated financial statements. This section provides an analysis of our financial results for the three and nine months ended September 30, 2021 compared to the three and nine months ended September 30, 2020.

Overview

We are a global provider of instruments, systems, subsystems and process control solutions that measure, monitor, deliver, analyze, power and control critical parameters of advanced manufacturing processes to improve process performance and productivity for our customers. Our products are derived from our core competencies in pressure measurement and control, flow measurement and control, gas and vapor delivery, gas composition analysis, electronic control technology, reactive gas generation and delivery, power generation and delivery, vacuum technology, temperature sensing, lasers, photonics, optics, precision motion control, vibration control and laser-based manufacturing systems solutions. We also provide services relating to the maintenance and repair of our products, installation services and training. Our primary served markets include semiconductor, industrial technologies, life and health sciences, and research and defense.

Recent Events

On July 15, 2021, we completed our previously announced acquisition of Photon Control (the “Photon Control Acquisition”), pursuant to a definitive agreement. Photon Control designs, manufactures and distributes a wide range of optical sensors and systems to measure temperature and position used in semiconductor wafer fabrication. At the effective time of the Photon Control Acquisition, each share of Photon Control’s common stock issued and outstanding as of immediately prior to the effective time of the Photon Control Acquisition was converted into the right to receive CAD 3.60 per share in cash, without interest and subject to deduction for any required withholding tax. We paid to the former Photon Control securityholders aggregate consideration of CAD 378.6 million or USD 302.7 million, excluding related transaction fees and expenses. We funded the payment of the aggregate consideration with available cash on hand. Photon Control is included in our Light & Motion (“L&M”) segment.

On July 1, 2021, we entered into a definitive agreement (as amended from time to time, the “Implementation Agreement”) to acquire Atotech, a leading process chemicals technology company and a market leader in advanced electroplating solutions. Pursuant to the Implementation Agreement, we agreed to pay \$16.20 per share in cash and 0.0552 of a share of our common stock for each outstanding common share of Atotech, for total cash and stock consideration of approximately \$5.1 billion. The acquisition is expected to close by the end of 2021, subject to the satisfaction of certain closing conditions, including receipt of required regulatory approvals, approval by the Royal Court of Jersey and approval by Atotech’s shareholders. Our obligations to complete the acquisition are not subject to any financing condition. We intend to fund the cash portion of the transaction with a combination of available cash on hand and committed term loan debt financing. In connection with entering into the Implementation Agreement, we entered into (a) a commitment letter (the “Initial Commitment Letter”), dated as of July 1, 2021, with JPMorgan Chase Bank, N.A. and Barclays Bank PLC (collectively, the “Initial Commitment Parties”) and (b) joinders to the Initial Commitment Letter to add certain additional lender parties (the “Commitment Letter Joinders” and, together with the Initial Commitment Letter, the “Commitment Letter”) dated as of July 23, 2021, with the Initial Commitment Parties and the additional lenders party thereto (collectively, the “Supplemental Commitment Parties” and, together with the Initial Commitment Parties, the “Commitment Parties”), pursuant to which, subject to the terms and conditions set forth therein, the Commitment Parties committed to provide (i) a senior secured term loan credit facility in an aggregate principal amount of \$5.3 billion (the “New Term Loan Facility”) and (ii) a senior secured revolving credit facility with aggregate total commitments of \$500 million (the “New Revolving Credit Facility”). The New Term Loan Facility and New Revolving Credit Facility would refinance the Term Loan Facility and ABL Facility, respectively, and the New Term Loan Facility would be used to finance a portion of the acquisition and to refinance certain existing indebtedness of Atotech.

On October 22, 2021, we completed the syndication of the New Term Loan Facility, comprised of two tranches: a USD 4.7 billion loan at LIBOR plus 2.25%, a floor of 0.50% and 0.25% of original issue discount, and a Euro tranche of EUR 0.5 billion (approximately USD 0.6 billion) at EURIBOR plus 2.75%, a floor of 0.00% and 0.25% of original issue discount. Proceeds from the anticipated New Term Loan Facility will be used to finance a portion of the acquisition of Atotech and to repay our existing Term Loan Facility and certain existing indebtedness of Atotech.

The Commitment Parties’ obligations under the Commitment Letter and the closing and initial funding under the New Term Loan Facility are subject to certain customary conditions including, without limitation, the consummation of the acquisition of Atotech in accordance with the Implementation Agreement, the accuracy of specified representations and warranties of us and other customary closing conditions.

Segments and Markets

The Vacuum & Analysis (“V&A”) segment provides a broad range of instruments, components and subsystems which are derived from our core competencies in pressure measurement and control, flow measurement and control, gas and vapor delivery, gas composition analysis, electronic control technology, reactive gas generation and delivery, power generation and delivery, and vacuum technology.

The Light & Motion (“L&M”) segment provides a broad range of instruments, components and subsystems which are derived from our core competencies in lasers, photonics, optics, temperature sensing, precision motion control and vibration control.

The Equipment & Solutions (“E&S”) segment provides a range of products including laser-based systems for printed circuit board (“PCB”) manufacturing, which include flexible interconnect PCB processing systems and high-density interconnect solutions for rigid PCB manufacturing and substrate processing and multi-layer ceramic capacitor test systems.

Semiconductor Market

A significant portion of our sales is derived from products sold to semiconductor capital equipment manufacturers and semiconductor device manufacturers. Our products are used in major semiconductor processing steps, such as depositing thin films of material onto silicon wafer substrates, etching, cleaning, lithography, metrology and inspection.

Approximately 61% and 60% of our net revenues for the nine months ended September 30, 2021 and 2020, respectively, were from sales to semiconductor capital equipment manufacturers and semiconductor device manufacturers.

We anticipate that the semiconductor market will continue to account for a substantial portion of our sales. While the semiconductor device manufacturing market is global, major semiconductor capital equipment manufacturers are concentrated in China, Japan, South Korea, Taiwan and the United States.

Net revenues in our semiconductor market increased by \$128.9 million, or 36%, for the three months ended September 30, 2021, compared to the same period in the prior year, primarily due to an increase of \$113.2 million and \$23.7 million from our V&A and L&M segments, respectively, offset by a decrease of \$8.0 million from our E&S segment. Net revenues in our semiconductor market increased by \$337.5 million, or 34%, for the nine months ended September 30, 2021, compared to the same period in the prior year, primarily due to an increase of \$327.2 million and \$33.8 million from our V&A and L&M segments, respectively, offset by a

decrease of \$23.5 million from our E&S segment, resulting from the discontinuance of certain non-core products. The net revenues from our L&M segment for each of the three and nine months ended September 30, 2021 included \$14.8 million from our acquisition of Photon Control.

The semiconductor capital equipment industry is subject to rapid demand shifts, which are difficult to predict, and we cannot be certain as to the timing or extent of future demand or any future weakness in the semiconductor capital equipment industry.

During the nine months ended September 30, 2021, we experienced supply chain disruptions and component shortages in our semiconductor market due to global capacity constraints compounded by increasing global demand as well as the ongoing COVID-19 pandemic. We expect these disruptions and shortages to continue in the near-term while our suppliers adjust to significant increases in demand and respond to the challenges posed by the COVID-19 pandemic, all of which may negatively impact revenue from our semiconductor market for the three months ending December 31, 2021.

Advanced Markets

In addition to the semiconductor market, our products are used in the industrial technologies, life and health sciences, and research and defense markets.

Industrial Technologies

Industrial technologies encompasses a wide range of diverse applications, such as flexible and rigid PCB processing/fabrication, glass coating, laser marking, measurement and scribing, natural gas and oil production, environmental monitoring and electronic thin films. Electronic thin films are a primary component of numerous electronic products including flat panel displays, light emitting diodes, solar cells and data storage media. Industrial technologies manufacturers are located in developed and developing countries across the globe.

Life and Health Sciences

Our products for life and health sciences are used in a diverse array of applications, including bioimaging, medical instrument sterilization, medical device manufacturing, analytical, diagnostic and surgical instrumentation, consumable medical supply manufacturing and pharmaceutical production. Our life and health sciences customers are located globally.

Research and Defense

Our products for research and defense are sold to government, university and industrial laboratories for applications involving research and development in materials science, physical chemistry, photonics, optics and electronics materials. Our products are also sold for monitoring and defense applications including surveillance, imaging and infrastructure protection. Major equipment providers and research laboratories are concentrated in China, Europe, Japan, South Korea, Taiwan, and the United States.

Approximately 39% and 40% of our net revenues for the nine months ended September 30, 2021 and 2020, respectively, were from advanced markets.

Net revenues from customers in our advanced markets increased by \$23.3 million, or 10%, for the three months ended September 30, 2021, compared to the same period in the prior year, primarily due to increases of \$9.1 million, \$8.6 million and \$5.6 million from our L&M, V&A and E&S segments, respectively. The increases were primarily due to increases in net revenues from our industrial technologies market, mainly related to electronic component and solar markets. Net revenues from customers in our advanced markets increased by \$178.4 million, or 26%, for the nine months ended September 30, 2021, compared to the same period in the prior year, primarily due to increases of \$81.7 million, \$54.2 million and \$42.5 million from our E&S, V&A and L&M segments, respectively. The increases were primarily due to increases in net revenues from our industrial technologies market related to PCB manufacturing.

International Markets

A significant portion of our net revenues is from sales to customers in international markets. For the nine months ended September 30, 2021 and 2020, international revenues accounted for approximately 58% and 55%, respectively, of our total net revenues. A significant portion of our international net revenues was from China, Japan, South Korea and Taiwan. We expect international net revenues will continue to represent a significant percentage of our total net revenues for the foreseeable future.

Long-lived assets located outside of North America accounted for approximately 25% and 28% of our total long-lived assets as of September 30, 2021 and December 31, 2020, respectively. Long-lived assets include property, plant and equipment, net, right-of-use assets, and certain other assets and exclude goodwill, intangible assets and long-term tax-related accounts.

Critical Accounting Policies and Estimates

The preparation of our consolidated financial statements and related disclosures in conformity with accounting principles generally accepted in the United States requires management to make judgments, assumptions and estimates that affect the amounts reported. There have been no material changes in our critical accounting policies since December 31, 2020.

For further information about our critical accounting policies, please see the discussion of critical accounting policies in our Annual Report on Form 10-K for the year ended December 31, 2020 in the section captioned “Management’s Discussion and Analysis of Financial Condition and Results of Operations – Critical Accounting Policies and Estimates.”

Results of Operations

The following table sets forth for the periods indicated the percentage of total net revenues of certain line items included in our condensed consolidated statements of operations and comprehensive income data.

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Net revenues:				
Products	87.5%	85.9%	87.4%	86.3%
Services	12.5	14.1	12.6	13.7
Total net revenues	100.0	100.0	100.0	100.0
Cost of revenues:				
Cost of product revenues	46.4	47.6	46.3	47.6
Cost of service revenues	6.6	8.0	6.8	7.6
Total cost of revenues (exclusive of amortization shown separately below)	53.0	55.6	53.1	55.2
Gross profit	47.0	44.4	46.9	44.8
Research and development	7.0	7.2	6.8	7.7
Selling, general and administrative	12.9	14.7	13.2	15.6
Acquisition and integration costs	1.2	0.1	0.9	0.2
Restructuring and other	0.3	0.5	0.5	0.4
Amortization of intangible assets	2.0	2.1	1.8	2.5
COVID-19 related net credits	—	—	—	0.1
Asset impairment	—	—	—	(0.1)
Income from operations	23.6	19.8	23.7	18.4
Interest income	—	—	—	0.1
Interest expense	0.8	1.1	0.9	1.4
Other expense, net	0.4	0.2	0.5	0.2
Income before income taxes	22.4	18.5	22.3	16.9
Provision for income taxes	4.6	2.9	3.9	2.9
Net income	17.8%	15.6%	18.4%	14.0%

Net Revenues

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
<i>(dollars in millions)</i>				
Products	\$ 649.1	\$ 506.8	\$ 1,910.8	\$ 1,441.0
Services	92.8	83.0	274.9	228.8
Total net revenues	\$ 741.9	\$ 589.8	\$ 2,185.7	\$ 1,669.8

Net product revenues increased \$142.3 million and \$469.8 million during the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year. These increases were primarily attributed to increases in net product revenues from our semiconductor customers, primarily due to volume increases, of \$119.6 million and \$300.3 million for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year, and increases in net product revenues from customers in advanced markets of \$22.7 million and \$169.5 million for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year.

Net service revenues consisted mainly of fees for services related to the maintenance and repair of our products, sales of spare parts, and installation and training. Net service revenues increased \$9.8 million and \$46.1 million during the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year. These increases were primarily due to increases of \$9.3 million and \$37.2 million in net service revenues from our semiconductor customers for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year.

Total international net revenues outside of North America, including product and service, were \$393.5 million and \$1,263.0 million for the three and nine months ended September 30, 2021, respectively, compared to \$308.6 million and \$912.1 million for the three and nine months ended September 30, 2020, respectively. These increases were primarily attributed to increases in net revenues in China, South Korea and Taiwan.

The following table sets forth our net revenues by reportable segment:

<i>(dollars in millions)</i>	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Net revenues:				
Vacuum & Analysis	\$ 483.1	\$ 361.3	\$ 1,376.6	\$ 995.1
Light & Motion	208.7	175.9	583.6	507.3
Equipment & Solutions	50.1	52.6	225.5	167.4
Total net revenues	\$ 741.9	\$ 589.8	\$ 2,185.7	\$ 1,669.8

Net revenues from our V&A segment increased \$121.8 million and \$381.5 million for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year, due to volume increases in net revenues from our semiconductor customers of \$113.2 million and \$327.2 million for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year, and increases in net revenues from customers in our advanced markets of \$8.6 million and \$54.3 million for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year, primarily from customers in our industrial technologies market.

Net revenues from our L&M segment increased \$32.8 million and \$76.3 million for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year, due to volume increases in net revenues from our semiconductor customers of \$23.7 million and \$33.8 million for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year, and increases in net revenues from customers in our advanced markets of \$9.1 million and \$42.5 million for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year.

Net revenues from our E&S segment decreased \$2.5 million for the three months ended September 30, 2021, compared to the same period in the prior year. Net revenues increased \$58.1 million for the nine months ended September 30, 2021, compared to the same period in the prior year, primarily from customers in our industrial technologies market.

Gross Margin

	Three Months Ended September 30,			Nine Months Ended September 30,		
	2021	2020	% Points Change	2021	2020	% Points Change
Gross margin as a percentage of net revenues:						
Products	46.9%	44.6%	2.3%	47.0%	44.9%	2.1%
Services	47.2	43.2	4.0	46.1	44.4	1.7
Total gross margin	47.0%	44.4%	2.6%	46.9%	44.8%	2.1%

Gross margin for our products increased by 2.3 and 2.1 percentage points for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year, primarily due to higher revenue volumes and favorable product mix, partially offset by higher freight and duty costs and higher consumable expenses as well as unfavorable overhead absorption.

Gross margin for our services increased by 4.0 and 1.7 percentage points for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year, primarily due to favorable absorption on products serviced partially offset by unfavorable product mix.

The following table sets forth gross margin as a percentage of net revenues by reportable segment:

	Three Months Ended September 30,			Nine Months Ended September 30,		
	2021	2020	% Points Change	2021	2020	% Points Change
Gross margin as a percentage of net revenues:						
Vacuum & Analysis	46.8%	45.3%	1.5%	46.8%	44.6%	2.2%
Light & Motion	48.3	43.1	5.2	46.7	44.9	1.8
Equipment & Solutions	42.6	43.0	(0.4)	48.4	45.4	3.0
Total gross margin	47.0%	44.4%	2.6%	46.9%	44.8%	2.1%

Gross margin for our V&A segment increased by 1.5 and 2.2 percentage points for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year, primarily due to higher revenue volumes.

Gross margin for our L&M segment increased by 5.2 and 1.8 percentage points for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year, primarily due to higher revenue volumes, favorable product mix and lower excess and obsolete inventory charges, partially offset by unfavorable absorption.

Gross margin for our E&S segment decreased by 0.4 percentage points for the three months ended September 30, 2021, compared to the same period in the prior year, primarily due to unfavorable absorption. Gross margin for our E&S segment increased by 3.0 percentage points for the nine months ended September 30, 2021 compared to the same period in the prior year, primarily due to favorable absorption and product mix.

Research and Development

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
<i>(dollars in millions)</i>				
Research and development	\$ 51.7	\$ 42.5	\$ 148.9	\$ 127.7

Research and development expenses increased \$9.2 million for the three months ended September 30, 2021, compared to the same period in the prior year. The increase was primarily related to an increase of \$6.2 million in compensation-related costs, an increase of \$1.3 million in project material costs and an increase of \$1.1 million in occupancy costs. Research and development expenses increased \$21.2 million for the nine months ended September 30, 2021, compared to the same period in the prior year. The increase was primarily related to increases of \$15.6 million in compensation-related costs, \$3.7 million in project material costs and \$2.2 million in occupancy costs. The acquisition of Photon Control accounted for \$1.6 million of the increase in the three and nine months ended September 30, 2021, compared to the same periods in the prior year.

Our research and development efforts are primarily focused on developing and improving our instruments, components, subsystems and process control solutions to improve process performance and productivity.

We have thousands of products and our research and development efforts primarily consist of a large number of projects related to these products, none of which is individually material to us. Current projects typically have durations of 3 to 30 months, depending upon whether the product is an enhancement of existing technology or a new product. Our products have continuously advanced as we strive to meet our customers' evolving needs. We have developed, and continue to develop, new products to address industry trends, such as the shrinking of integrated circuit critical dimensions and technology inflections, and, in the flat panel display and solar markets, the transition to larger substrate sizes, which require more advanced processing and process control technology, the continuing drive toward more complex and accurate components and devices within the handset and tablet market, the transition to 5G for both devices and infrastructure, supporting the growth in units and via counts of the high density interconnect PCB drilling market, and the industry transition to electric cars in the automotive market. In addition, we have developed, and continue to develop, products that support the migration to new classes of materials, ultra-thin layers, and 3D structures that are used in small geometry manufacturing. Research and development expenses consist primarily of salaries and related expenses for personnel engaged in

research and development, fees paid to consultants, material costs for prototypes and other expenses related to the design, development, testing and enhancement of our products.

We believe that the continued investment in research and development and ongoing development of new products are essential to the expansion of our markets. We expect to continue to make significant investment in research and development activities. We are subject to risks from products not being developed in a timely manner, as well as from rapidly changing customer requirements and competitive threats from other companies and technologies. Our success primarily depends on our products being designed into new generations of equipment for the semiconductor industry and advanced technology markets. We develop products that are technologically advanced so that they are positioned to be chosen for use in each successive generation of semiconductor capital equipment and advanced market applications. If our products are not chosen to be designed into our customers' products, our net revenues may be reduced during the lifespan of those products.

Selling, General and Administrative

<i>(dollars in millions)</i>	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Selling, general and administrative	\$ 95.8	\$ 87.0	\$ 288.9	\$ 260.3

Selling, general and administrative expenses increased \$8.8 million for the three months ended September 30, 2021, compared to the same period in the prior year. The increase was primarily related to an increase of \$7.2 million in compensation-related costs and \$2.2 million in commissions expense. Selling, general and administrative expenses increased \$28.6 million for the nine months ended September 30, 2021, compared to the same period in the prior year. The increase was primarily related to an increase of \$25.7 million in compensation-related costs and \$5.1 million in commissions expense, partially offset by a decrease of \$1.7 million in consulting and professional fees. The acquisition of Photon Control accounted for \$1.7 million of the selling, general and administrative expense for the three and nine months ended September 30, 2021.

Acquisition and Integration Costs

<i>(dollars in millions)</i>	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Acquisition and integration costs	\$ 8.6	\$ 0.5	\$ 20.8	\$ 3.4

Acquisition and integration costs during the three months ended September 30, 2021 primarily related to consulting and professional fees related to our acquisition of Photon Control, which closed in July 2021, and the announced acquisition of Atotech. Acquisition and integration costs during the nine months ended September 30, 2021 related to consulting and professional fees in connection with our recent acquisition of Photon Control, the announced acquisition of Atotech and our proposed acquisition of Coherent, Inc. Acquisition and integration costs during the three and nine months ended September 30, 2020 consisted of integration costs related to the acquisition of ESI (the "ESI Merger"), consisting primarily of cash bonus and stock-based compensation for certain ESI executives assisting in the integration process.

Restructuring and Other

<i>(dollars in millions)</i>	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Restructuring and other	\$ 2.0	\$ 3.1	\$ 9.9	\$ 6.8

Restructuring and other costs during the three and nine months ended September 30, 2021 primarily related to duplicate facility costs attributed to entering into new leases, severance costs due to a global cost saving initiative, severance costs relating to the pending closure of two facilities in Europe and the movement of certain product manufacturing to low cost regions. Restructuring and other costs during the three and nine months ended September 30, 2020 primarily related to duplicate facility costs attributed to entering into new leases, costs related to the exit of certain product groups and costs related to the closure of a facility in Europe. Such costs for the nine months ended September 30, 2020 were partially offset by an insurance reimbursement related to a legal settlement.

Amortization of Intangible Assets

<i>(dollars in millions)</i>	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Amortization of intangible assets	\$ 15.0	\$ 12.5	\$ 40.1	\$ 42.6

Amortization of intangible assets increased by \$2.5 million for the three months ended September 30, 2021, compared to the same period in the prior year, primarily due to amortization expense from our acquisition of Photon Control. The decrease in amortization of intangible assets of \$2.5 million for the nine months ended September 30, 2021, compared to the same period in the prior year, was due to certain intangible assets in our L&M segment that became fully amortized, partially offset by amortization from our acquisition of Photon Control.

Interest Expense, Net

<i>(dollars in millions)</i>	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Interest expense, net	\$ 6.2	\$ 6.5	\$ 18.7	\$ 21.6

Interest expense, net, decreased by \$0.3 million and \$2.9 million for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year, primarily due to lower interest rates and lower average debt balances as a result of payments made.

Other Expense, Net

<i>(dollars in millions)</i>	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Other expense, net	\$ 2.9	\$ 1.1	\$ 11.5	\$ 3.0

Other expense, net, increased by \$1.8 million and \$8.5 million for the three and nine months ended September 30, 2021, respectively, compared to the same periods in the prior year, primarily due to higher foreign exchange and fair value losses. The nine months ended September 30, 2021 included a fair value loss of \$10.3 million resulting from hedges of the Canadian dollar related to the funding of our purchase of Photon Control in July 2021.

Provision for Income Taxes

<i>(dollars in millions)</i>	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Provision for income taxes	\$ 33.8	\$ 17.1	\$ 85.7	\$ 48.0

Our effective tax rates for the three and nine months ended September 30, 2021 were 20.4% and 17.6%, respectively. Our effective tax rates for each of the three and nine months ended September 30, 2021 and related income tax expense were lower than the U.S. statutory tax rate mainly due to the U.S. deduction for foreign derived intangible income, windfall benefits from stock compensation, and the geographic mix of income earned by our international subsidiaries being taxed at rates lower than the U.S. statutory tax rate, offset by the U.S. global intangible low-taxed income inclusion and additional withholding taxes on inter-company distributions due to the United Kingdom's withdrawal from the European Union.

On March 11, 2021, President Biden signed into law the American Rescue Plan Act of 2021 ("ARPA"). The act contains numerous income tax provisions among other tax and non-tax provisions to provide COVID-19 pandemic relief. We have evaluated the ARPA legislation in relation to income taxes and we do not expect the ARPA income tax provisions to have a material impact on our financial statements in the current year. The ARPA income tax provisions that are effective in future years are being evaluated and we have not yet determined the impact on our consolidated financial statements.

On September 15, 2021, the House Ways and Means Committee approved tax proposals, including a series of corporate and international tax provisions one of which would increase the corporate tax rate from 21% to 26.5%. If this tax proposal is enacted in its current form, we expect our income tax expense would materially increase.

As of September 30, 2021 and December 31, 2020, the total amount of gross unrecognized tax benefits, which excludes interest and penalties, was approximately \$47.3 million and \$47.0 million, respectively. We accrue interest expense, and if applicable, penalties, for any uncertain tax positions. Interest and penalties are classified as a component of income tax expense. As of September 30, 2021 and December 31, 2020, we had accrued interest on unrecognized tax benefits of approximately \$0.9 million and \$0.7 million, respectively.

Over the next 12 months it is reasonably possible that we may recognize approximately \$3.8 million of previously net unrecognized tax benefits, excluding interest and penalties, related to U.S. federal and state as well as foreign tax positions as a result of the expiration of statutes of limitation. The U.S. federal statute of limitations remains open for tax years 2017 through present. The statute of limitations for our tax filings in other jurisdictions varies between fiscal years 2015 through the present. We also have certain federal credit carryforwards and state tax loss and credit carryforwards that are open to examination for tax years 2000 through the present.

On a quarterly basis, we evaluate both positive and negative evidence that affects the realizability of net deferred tax assets and assess the need for a valuation allowance. The future benefit to be derived from our deferred tax assets is dependent upon our ability to generate sufficient future taxable income in each jurisdiction of the right type to realize the assets.

Our future effective tax rate depends on various factors, including the impact of tax legislation, further interpretations and guidance from U.S. federal and state governments on the impact of proposed regulations issued by the Internal Revenue Service, further interpretations and guidance from foreign governments, the geographic composition of our pre-tax income, and changes in income tax reserves for unrecognized tax benefits. We monitor these factors and timely adjust our estimates of the effective tax rate accordingly. We expect that the geographic mix of pre-tax income will continue to have a favorable impact on our effective tax rate. However, the geographic mix of pre-tax income can change based on multiple factors, resulting in changes to the effective tax rate in future periods. While we believe we have adequately provided for all tax positions, amounts asserted by taxing authorities could materially differ from our accrued positions as a result of uncertain and complex application of tax law and regulations. Additionally, the recognition and measurement of certain tax benefits include estimates and judgment by management. Accordingly, we could record additional provisions or benefits for U.S. federal, state, and foreign tax matters in future periods as new information becomes available.

Liquidity and Capital Resources

On July 15, 2021, we completed our previously announced acquisition of Photon Control. We paid to the former Photon Control securityholders aggregate consideration of CAD 378.6 million or USD 302.7 million, excluding related transaction fees and expenses. We funded the payment of the aggregate consideration with available cash on hand.

Cash and cash equivalents and short-term marketable investments totaled \$879.6 million at September 30, 2021, compared to \$836.0 million at December 31, 2020. The primary driver in our current and anticipated future cash flows is and will continue to be cash generated from operations, consisting primarily of our net income, excluding non-cash charges and changes in operating assets and liabilities. In periods when our sales are growing, higher sales to customers will result in increased trade receivables, and inventories will generally increase as we build products for future sales. This may result in lower cash generated from operations. Conversely, in periods when our sales are declining, our trade accounts receivable and inventory balances will generally decrease, resulting in increased cash from operations.

Net cash provided by operating activities was \$445.2 million for the nine months ended September 30, 2021 and resulted from net income of \$401.2 million, which included non-cash charges of \$126.6 million, offset by a net increase in working capital of \$82.6 million. The net increase in working capital was primarily due to a decrease in income tax payable of \$28.7 million, an increase in trade accounts receivable of \$51.3 million and an increase in inventories of \$61.7 million, partially offset by an increase in accounts payable of \$38.2 million and an increase in other current and non-current liabilities of \$18.6 million.

Net cash used in investing activities was \$351.2 million for the nine months ended September 30, 2021, including the purchase of Photon Control for \$268.4 million, net of cash acquired, the purchases of production-related equipment of \$63.3 million and the net purchases of investments of \$19.5 million.

Net cash used in financing activities was \$61.7 million for the nine months ended September 30, 2021 and was primarily due to dividend payments of \$35.5 million, net payments on short and long-term borrowings of \$11.8 million and net payments related to tax payments on the vesting of employee stock awards of \$14.4 million.

On July 25, 2011, our Board of Directors approved a share repurchase program for the repurchase of up to an aggregate of \$200 million of our outstanding common stock from time to time in open market purchases, privately negotiated transactions or through other appropriate means. The timing and quantity of any shares repurchased depends upon a variety of factors, including business conditions, stock market conditions and business development activities, including but not limited to merger and acquisition opportunities. These repurchases may be commenced, suspended or discontinued at any time without prior notice. We have

repurchased approximately 2.6 million shares of common stock for approximately \$127 million pursuant to the program since its adoption. During the three and nine months ended September 30, 2021 and 2020, there were no repurchases of common stock.

Holders of our common stock are entitled to receive dividends when and if they are declared by our Board of Directors. In addition, we accrue dividend equivalents on the restricted stock units we assumed in the ESI Merger when dividends are declared by our Board of Directors. During the first quarter of 2021, our Board of Directors declared a cash dividend of \$0.20 per share. During each of the second and third quarters of 2021, our Board of Directors declared a cash dividend of \$0.22 per share. The total amount of the dividends declared in 2021 was \$35.5 million, or \$0.64 per share. During each of the first, second, and third quarters of 2020, our Board of Directors declared a cash dividend of \$0.20 per share, which totaled \$33.0 million, or \$0.60 per share.

On October 25, 2021, our Board of Directors declared a quarterly cash dividend of \$0.22 per share to be paid on December 10, 2021 to stockholders of record as of November 29, 2021.

Future dividend declarations, if any, as well as the record and payment dates for such dividends, are subject to the final determination of our Board of Directors. In addition, under the terms of our Term Loan Facility and ABL Facility, each as defined and described further below, we may be restricted from paying dividends under certain circumstances.

Senior Secured Term Loan Credit Facility

In connection with the completion of the acquisition of Newport Corporation (“Newport”) in 2016 (the “Newport Merger”), we entered into a term loan credit agreement (as amended, the “Term Loan Credit Agreement”) with Barclays Bank PLC, as administrative agent and collateral agent, and the lenders from time to time party thereto, which provided a senior secured term loan credit facility (the “Term Loan Facility”) in the original principal amount of \$780.0 million. We have entered into seven amendments to the Term Loan Credit Agreement since 2016, including most recently the May Term Loan Amendment (as defined below). The Term Loan Facility is subject to increase at our option and subject to receipt of lender commitments in accordance with the Term Loan Credit Agreement. The maturity date of the Term Loan Facility is February 2, 2026. As of September 30, 2021, borrowings under the Term Loan Facility bear interest per annum at one of the following rates selected by us: (a) a base rate determined by reference to the highest of (1) the federal funds effective rate plus 0.50%, (2) the “prime rate” quoted in *The Wall Street Journal*, (3) a London Interbank Offered Rate (“LIBOR”) rate determined by reference to the costs of funds for U.S. dollar deposits for an interest period of one month adjusted for certain additional costs, plus 1.00%, and (4) a floor of 1.00%, plus, in each case, an applicable margin of 0.75%; or (b) a LIBOR rate determined by reference to the costs of funds for U.S. dollar deposits for the interest period relevant to such borrowing adjusted for certain additional costs, subject to a LIBOR rate floor of 0.0%, plus an applicable margin of 1.75%. We have elected the interest rate as described in clause (b) of the foregoing sentence. The Term Loan Credit Agreement provides that, unless an alternate rate of interest is agreed, all loans will be determined by reference to the base rate if the LIBOR rate cannot be ascertained, if regulators impose material restrictions on the authority of a lender to make LIBOR rate loans, or for other reasons.

In May 2021, we entered into an amendment (the “May Term Loan Amendment”) to the Term Loan Credit Agreement. The May Term Loan Amendment amends the Term Loan Facility to, among other things, (i) increase our ability to incur additional incremental debt facilities to (x) the greater of (1) \$600.0 million and (2) 100% of consolidated EBITDA, plus (y) an amount equal to the sum of all voluntary prepayments of term loans under the Term Loan Facility, plus (z) an additional unlimited amount subject to pro forma compliance with a secured leverage ratio test of 3.25:1.00, and (ii) increase our flexibility under certain debt, lien, investment, restricted payment and disposition baskets. The fees incurred, including certain customary lender consent fees, in connection with the May Term Loan Amendment were immaterial.

As of September 30, 2021, we have incurred an aggregate amount of \$42.6 million of deferred finance fees, original issue discount and repricing fees related to the term loans under the Term Loan Facility, which are included in long-term debt in the accompanying condensed consolidated balance sheets and are being amortized to interest expense over the estimated life of the term loans using the effective interest method. As of September 30, 2021, the remaining balance of deferred finance fees, original issue discount and repricing fees related to the term loans under the Term Loan Facility was \$8.0 million. A portion of the deferred finance fees, original issue discount and repricing fees have been accelerated in connection with the various debt prepayments and amendments between 2016 and 2021.

We are required to make scheduled quarterly amortization payments each equal to 0.25% of the original principal amount of the Term Loan Facility.

As of September 30, 2021, after giving effect to all amendments and repayments prior to such date, the outstanding principal amount of the Term Loan Facility was \$826.7 million, and the interest rate was 1.8%.

Under the Term Loan Credit Agreement, we are required to prepay outstanding term loans, subject to certain exceptions, with portions of our annual excess cash flow as well as with the net cash proceeds of certain of our asset sales, certain casualty and condemnation events and the incurrence or issuance of certain debt.

All obligations under the Term Loan Facility are guaranteed by certain of our domestic subsidiaries and are secured by substantially all of our assets and the assets of such subsidiaries, subject to certain exceptions and exclusions.

The Term Loan Credit Agreement contains customary representations and warranties, affirmative and negative covenants and provisions relating to events of default. If an event of default occurs, the lenders under the Term Loan Facility will be entitled to take various actions, including the acceleration of amounts due under the Term Loan Facility and all actions generally permitted to be taken by a secured creditor. At September 30, 2021, we were in compliance with all covenants under the Term Loan Credit Agreement.

Interest Rate Swap Agreements

We entered into various interest rate swap agreements as described further in Note 6 to the Condensed Consolidated Financial Statements that exchange the variable LIBOR interest rate to a fixed rate in order to manage the exposure to interest rate fluctuations associated with the variable LIBOR interest rate paid on the outstanding balance of the Term Loan Facility.

Senior Secured Asset-Based Revolving Credit Facility

In February 2019, in connection with the completion of the ESI Merger, we entered into an asset-based revolving credit agreement with Barclays Bank PLC, as administrative agent and collateral agent, the other borrowers from time to time party thereto, and the lenders and letters of credit issuers from time to time party thereto (the "ABL Credit Agreement"), that provides a senior secured asset-based revolving credit facility of up to \$100.0 million, subject to a borrowing base limitation (the "ABL Facility"). We have entered into two amendments to the ABL Credit Agreement since 2019. As of September 30, 2021, after giving effect to all amendments, the borrowing base for the ABL Facility at any time equals the sum of: (a) 85% of certain eligible accounts; plus (b) prior to certain notice and field examination and appraisal requirements, the lesser of (i) 20% of net book value of eligible inventory in the United States and (ii) 30% of the borrowing base, and after the satisfaction of such requirements, the lesser of (i) the lesser of (A) 65% of the lower of cost or market value of certain eligible inventory and (B) 85% of the net orderly liquidation value of certain eligible inventory and (ii) 30% of the borrowing base; minus (c) reserves established by the administrative agent, in each case, subject to additional limitations and examination requirements for eligible accounts and eligible inventory acquired in an acquisition after February 1, 2019. The ABL Facility includes borrowing capacity in the form of letters of credit up to \$25.0 million. We have not borrowed against the ABL Facility to date.

As of September 30, 2021, any borrowings under the ABL Facility bear interest at a rate per annum equal to, at our option, any of the following, plus, in each case, an applicable margin: (a) a base rate determined by reference to the highest of (1) the federal funds effective rate plus 0.50%, (2) the "prime rate" quoted in *The Wall Street Journal*, (3) a LIBOR rate determined by reference to the costs of funds for U.S. dollar deposits for an interest period of one month adjusted for certain additional costs, plus 1.00% and (4) a floor of 0.00%, plus, in each case, an applicable margin ranging from 0.25% to 0.50%; and (b) a LIBOR rate determined by reference to the costs of funds for U.S. dollar deposits for the interest period relevant to such borrowing adjusted for certain additional costs, with a floor of 0.00%, plus, in each case, an applicable margin ranging from 1.25% to 1.50%. The applicable margin for borrowings thereunder is subject to upward or downward adjustment each fiscal quarter, based on the average historical excess availability during the preceding quarter.

In addition to paying interest on any outstanding principal under the ABL Facility, we are required to pay a commitment fee in respect of the unutilized commitments thereunder equal to 0.25% per annum. We must also pay customary letter of credit fees and agency fees.

Under the ABL Facility, we are required to prepay amounts outstanding under the ABL Facility (1) if amounts outstanding under the ABL Facility exceed the lesser of (a) the commitment amount and (b) the borrowing base, in an amount required to reduce such shortfall, (2) if amounts outstanding under the ABL Facility in any currency other than U.S. dollars exceed the sublimit for such currency, in an amount required to reduce such shortfall, and (3) during any period in which we have excess availability less than the greater of (a) 10.0% of the lesser of (x) the commitment amount and (y) the borrowing base (the "Line Cap") and (b) \$8.5 million for 3 consecutive business days, until the time when we have excess availability equal to or greater than the greater of (A) 10.0% of the Line Cap and (B) \$8.5 million for 30 consecutive days, or during the continuance of an event of default, with immediately available funds in our blocked accounts.

There is no scheduled amortization under the ABL Facility. Any principal amount outstanding under the ABL Facility is due and payable in full on the fifth anniversary of the closing date, subject to a springing maturity in the event that term loans under the Term Loan Facility in an aggregate amount of at least \$100.0 million have an earlier maturity date than the ABL Facility.

All obligations under the ABL Facility are guaranteed by certain of our domestic subsidiaries and are secured by substantially all of our assets and the assets of such subsidiaries, subject to certain exceptions and exclusions.

From the time when we have excess availability less than the greater of (a) 10.0% of the Line Cap and (b) \$8.5 million until the time when we have excess availability equal to or greater than the greater of (a) 10.0% of the Line Cap and (b) \$8.5 million for 30 consecutive days, or during the continuance of an event of default, the ABL Credit Agreement requires that we maintain a fixed charge coverage ratio, tested on the last day of each fiscal quarter, of at least 1.0 to 1.0.

The ABL Credit Agreement also contains customary representations and warranties, affirmative covenants and provisions relating to events of default. If an event of default occurs, the lenders under the ABL Facility will be entitled to take various actions, including the acceleration of amounts due under the ABL Facility and all actions permitted to be taken by a secured creditor.

Lines of Credit and Borrowing Arrangements

Our Japanese subsidiaries have lines of credit and a financing facility with various financial institutions, many of which generally expire and are renewed at three-month intervals with the remaining having no expiration date. The lines of credit and financing facility provided for aggregate borrowings as of September 30, 2021 of up to an equivalent of \$29.9 million U.S. dollars. There were no borrowings outstanding under these arrangements at September 30, 2021. Total borrowings outstanding under these arrangements were \$5.5 million at December 31, 2020.

Atotech Acquisition

On July 1, 2021, we entered into an Implementation Agreement to acquire Atotech, a leading process chemicals technology company and a market leader in advanced electroplating solutions. Pursuant to the Implementation Agreement, we agreed to pay \$16.20 per share in cash and 0.0552 of a share of our common stock for each outstanding common share of Atotech, for total cash and stock consideration of approximately \$5.1 billion. The acquisition is expected to close by the end of 2021, subject to the satisfaction of certain closing conditions, including receipt of required regulatory approvals, approval by the Royal Court of Jersey and approval by Atotech's shareholders. Our obligations to complete the acquisition are not subject to any financing condition. Additional information regarding the funding of the acquisition and the related syndication of the New Term Loan Facility is discussed under "Recent Events" above.

Off-Balance Sheet Arrangements

We do not have any financial partnerships with unconsolidated entities, such as entities often referred to as structured finance, special purpose or variable interest entities, which are often established for the purpose of facilitating off-balance sheet arrangements or for other contractually narrow or limited purposes. Accordingly, we have no off-balance sheet arrangements that have or are reasonably expected to have a current or future effect on our financial condition, changes in financial condition, revenues or expenses, results of operations, liquidity, capital expenditures or capital resources that are material to investors.

Contractual Obligations

There have been no other changes outside the ordinary course of business to our contractual obligations as disclosed in our Annual Report on Form 10-K for the year ended December 31, 2020.

Recently Issued Accounting Pronouncements

In October 2021, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2021-08, "Business Combinations (Topic 805): Accounting for Contract Assets and Contract Liabilities from Contracts with Customers" ("ASU No. 2021-08"). ASU No. 2021-08 will require companies to apply the definition of a performance obligation under ASC Topic 606 to recognize and measure contract assets and contract liabilities (i.e., deferred revenue) relating to contracts with customers that are acquired in a business combination. Under current U.S. GAAP, an acquirer generally recognizes assets acquired and liabilities assumed in a business combination, including contract assets and contract liabilities arising from revenue contracts with customers, at fair value on the acquisition date. ASU No. 2021-08 will result in the acquirer recording acquired contract assets and liabilities on the same basis that would have been recorded by the acquiree before the acquisition under ASC Topic 606. ASU No. 2021-08 is effective for fiscal years beginning after December 15, 2022, with early adoption permitted. We are currently evaluating the impact of this ASU on our financial statements.

In March 2020, the FASB issued ASU 2020-04, "Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting." This standard provides temporary optional expedients and exceptions to accounting guidance on contract modifications and hedge accounting to ease entities' financial reporting burdens, as the market transitions from the LIBOR and other interbank offered rates to alternative reference rates. The standard was effective upon issuance and generally can be applied through December 31, 2022. In January 2021, the FASB issued ASU 2021-01, "Reference Rate Reform (Topic 848): Scope." The amendments in this update clarify that certain optional expedients and exceptions in Topic 848 for contract modifications and hedge accounting apply to derivative instruments that use an interest rate for margining, discounting, or contract price alignment that is

modified as a result of reference rate reform. Amendments in this update to the expedients and exceptions in Topic 848 capture the incremental consequences of the scope clarification and tailor the existing guidance to derivative instruments affected by the discounting transition. The amendments in this update do not apply to contract modifications made after December 31, 2022, new hedging relationships entered into after December 31, 2022, and existing hedging relationships evaluated for effectiveness in periods after December 31, 2022, except for hedging relationships existing as of December 31, 2022, that apply certain optional expedients in which the accounting effects are recorded through the end of the hedging relationship (including periods after December 31, 2022). Our adoption of the requirements of these standards has not resulted in a material impact on our financial position, results of operations and cash flows, but the adoption of the requirements may impact us in the future.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Information concerning market risk is contained in the section entitled “Quantitative and Qualitative Disclosures About Market Risk” contained in our Annual Report on Form 10-K for the year ended December 31, 2020 filed with the Securities and Exchange Commission on February 23, 2021. As of September 30, 2021, there were no material changes in our exposure to market risk from December 31, 2020.

ITEM 4. CONTROLS AND PROCEDURES.

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures as of September 30, 2021. The term “disclosure controls and procedures,” as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the “Exchange Act”), means controls and other procedures of an issuer that are designed to ensure that information required to be disclosed by the issuer in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the Securities and Exchange Commission’s rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by an issuer in the reports that it files or submits under the Exchange Act is accumulated and communicated to the issuer’s management, including its principal executive and principal financial officers, or persons performing similar functions as appropriate to allow timely decisions regarding required disclosure. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on the evaluation of our disclosure controls and procedures as of September 30, 2021, our Chief Executive Officer and Chief Financial Officer concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level to ensure that information required to be disclosed by us in reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in Securities and Exchange Commission rules and forms, and is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer as appropriate to allow timely decisions regarding required disclosure.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) during the quarter ended September 30, 2021 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS.

For a description of our material pending legal proceedings, see Note 19 to the Notes to the Condensed Consolidated Financial Statements contained in Part 1, Item 1 of this Quarterly Report on Form 10-Q.

ITEM 1A. RISK FACTORS.

Information regarding risk factors affecting the Company's business is discussed in the section entitled "Risk Factors" in the Company's Annual Report on Form 10-K for the year ended December 31, 2020 and the section entitled "Risk Factors" in the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2021, which section is incorporated by reference herein.

ITEM 6. EXHIBITS.

Exhibit No.	Exhibit Description
+2.1 (1)	Implementation Agreement, between the Registrant and Atotech Limited, dated as of July 1, 2021
+3.1 (2)	Restated Articles of Organization of the Registrant
+3.2 (3)	Articles of Amendment to Restated Articles of Organization of the Registrant, as filed with the Secretary of State of Massachusetts on May 18, 2001
+3.3 (4)	Articles of Amendment to Restated Articles of Organization of the Registrant, as filed with the Secretary of State of Massachusetts on May 16, 2002
+3.4 (5)	Amended and Restated By-Laws of the Registrant
+10.1 (1)	Lock-Up Agreement, between the Registrant and the Carlyle Shareholders, dated as of July 1, 2021
+10.2 (1)	Commitment Letter, by and among the Registrant, JPMorgan Chase Bank, N.A. and Barclays Bank PLC, dated as of July 1, 2021
+10.3 (6)	Letter Agreement, by and among the Registrant, Atotech Limited and Atotech Manufacturing, Inc., dated October 29, 2021
+10.4 (6)*	Amendment, dated October 25, 2021, to Employment Agreement, effective September 16, 2019, between James Schreiner and the Registrant
31.1	Certification of Principal Executive Officer pursuant to Rule 13a-14(a)/Rule 15d-14(a) of the Securities Exchange Act of 1934, as amended
31.2	Certification of Principal Financial Officer pursuant to Rule 13a-14(a)/Rule 15d-14(a) of the Securities Exchange Act of 1934, as amended
32.1	Certification of Chief Executive Officer and Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document
101.SCH	Inline XBRL Taxonomy Extension Schema Document
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document
104	Cover Page Interactive Data File (formatted as inline XBRL with applicable taxonomy extension information contained in Exhibits 101)

+ Previously filed

* Management contract or compensatory plan arrangement

- (1) Incorporated by reference to the Registrant's Current Report on Form 8-K (File No. 000-23621), filed with the Securities and Exchange Commission on July 2, 2021.
- (2) Incorporated by reference to the Registration Statement on Form S-4 (File No. 333-49738), filed with the Securities and Exchange Commission on November 13, 2000.
- (3) Incorporated by reference to the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2001 (File No. 000-23621), filed with the Securities and Exchange Commission on August 14, 2001.
- (4) Incorporated by reference to the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2002 (File No. 000-23621), filed with the Securities and Exchange Commission on August 13, 2002.

- (5) Incorporated by reference to the Registrant's Current Report on Form 8-K (File No. 000-23621), filed with the Securities and Exchange Commission on May 6, 2014.
- (6) Incorporated by reference to the Registrant's Current Report on Form 8-K (File No. 000-23621), filed with the Securities and Exchange Commission on October 29, 2021.

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.

MKS INSTRUMENTS, INC.

Date: November 3, 2021

By: /s/ Seth H. Bagshaw
Seth H. Bagshaw
Senior Vice President, Chief Financial Officer and Treasurer
(Principal Financial Officer)

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO RULE 13a-14(a)/RULE 15d-14(a) OF THE
SECURITIES EXCHANGE ACT OF 1934, AS AMENDED

I, John T.C. Lee, certify that:

1. I have reviewed this quarterly report on Form 10-Q of MKS Instruments, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Dated: November 3, 2021

/s/ John T.C. Lee

John T.C. Lee
President and Chief Executive Officer
(Principal Executive Officer)

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
PURSUANT TO RULE 13a-14(a)/RULE 15d-14(a) OF THE
SECURITIES EXCHANGE ACT OF 1934, AS AMENDED

I, Seth H. Bagshaw, certify that:

1. I have reviewed this quarterly report on Form 10-Q of MKS Instruments, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Dated: November 3, 2021

/s/ Seth H. Bagshaw

Seth H. Bagshaw
Senior Vice President, Chief Financial Officer and Treasurer
(Principal Financial Officer)

CERTIFICATION OF CHIEF EXECUTIVE OFFICER AND CHIEF FINANCIAL OFFICER

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 Quarterly Report on Form 10-Q of MKS Instruments, Inc. (the "Company") for the period ended September 30, 2021 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, John T.C. Lee, President and Chief Executive Officer of the Company, and Seth H. Bagshaw, Senior Vice President, Chief Financial Officer and Treasurer 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, based on his knowledge:

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

Dated: November 3, 2021

/s/ John T.C. Lee

John T.C. Lee

President and Chief Executive Officer

(Principal Executive Officer)

Dated: November 3, 2021

/s/ Seth H. Bagshaw

Seth H. Bagshaw

Senior Vice President, Chief Financial Officer and Treasurer

(Principal Financial Officer)