Annual Report

2022

METTLER TOLEDO

METTLER TOLEDO

METTLER TOLEDO (NYSE:MTD) is a leading global supplier of precision instruments and services. We have strong leadership positions in all of our businesses and believe we hold global number-one market positions in most of them. We are recognized as an innovation leader and our solutions are critical in key R&D, quality control, and manufacturing processes for customers in a wide range of industries including life sciences, food, and chemicals. Our sales and service network is one of the most extensive in the industry. Our products are sold in more than 140 countries and we have a direct presence in approximately 40 countries. With proven growth strategies and a focus on execution, we have achieved a long-term track record of strong financial performance.

$3.920 billion
Sales

30.4%
Adjusted Operating Profit Margin

$39.65
Adjusted Earnings per Share

$781 million
Free Cash Flow

~18,000
Workforce

On the cover: The SevenDirect Advanced line of pH meters provides accurate measurements of pH, ion concentration, and conductivity of almost any sample. Their ease of use, data handling options, and robust design are ideal for a variety of applications and industries. METTLER TOLEDO is a global leader in precision laboratory instruments.

Financial Highlights

2022 At-a-Glance

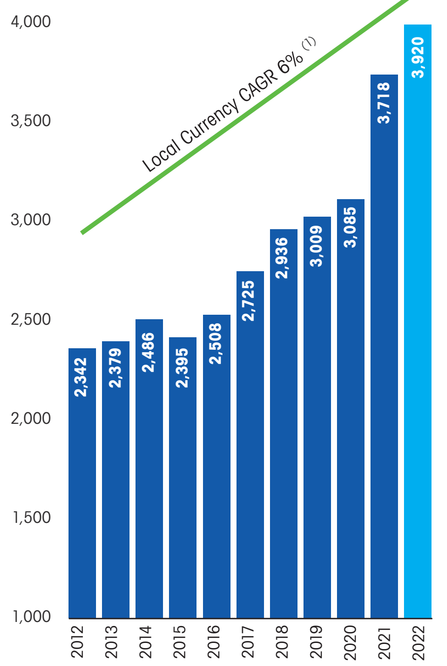
+11%
Local currency sales growth

+190 basis points
Adjusted operating profit margin expansion

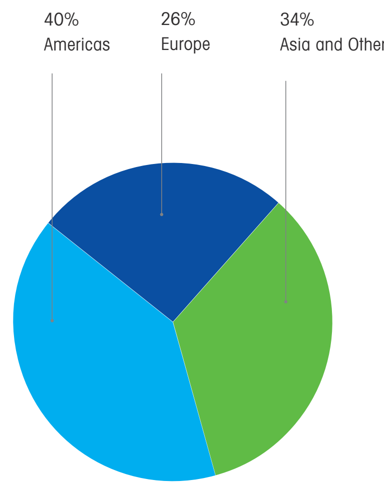
+17%
Adjusted EPS growth

-5%
Free cash flow

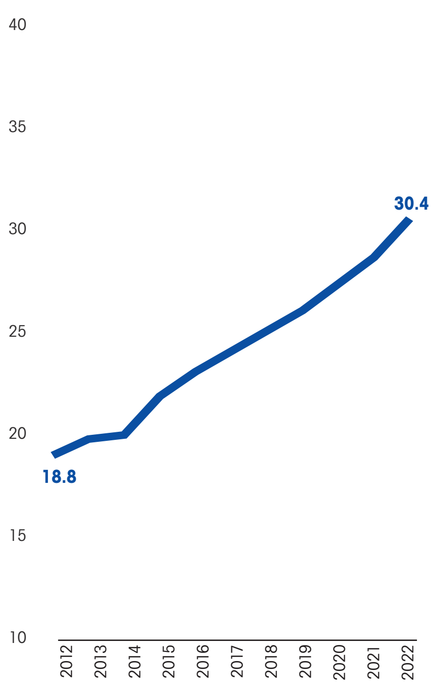
Sales
($ in millions)



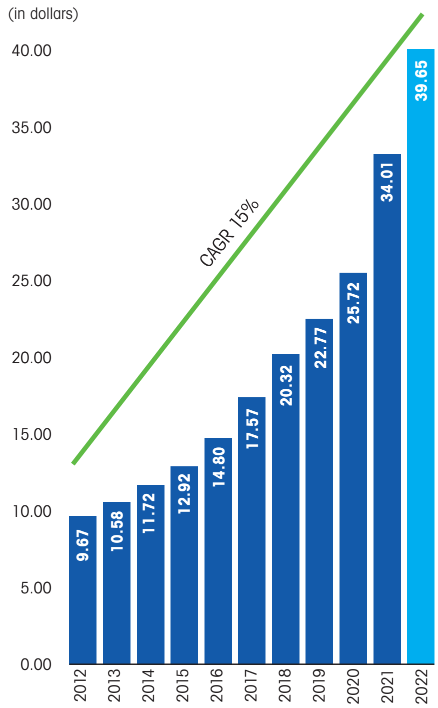
Sales by Customer Destination



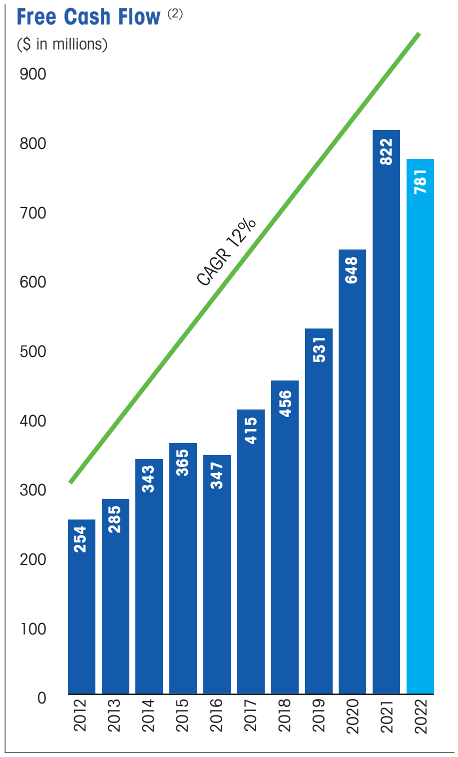
Adjusted Operating Profit Margin [2]
(in %)



Adjusted Earnings per Share [2]
(in dollars)



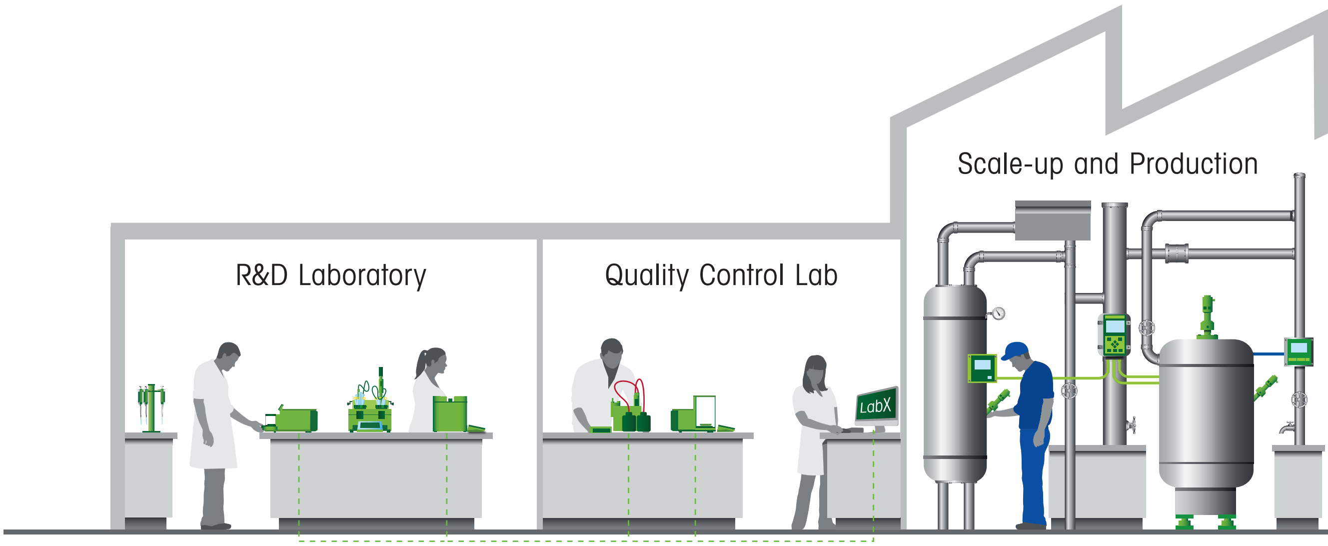
Free Cash Flow [2]
($ in millions)



[1] CAGR in USD for the period 2012 – 2022 is 5%.

[2] Represents non-GAAP financial measure; a reconciliation to U.S. GAAP metrics is provided in the appendix.

Providing Solutions
Across Our Customer's Value Chain



R&D Laboratory

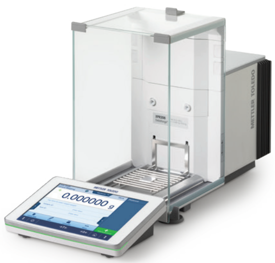
Our precise instruments are the foundation of research and quality control labs all over the world. High-performance weighing solutions offer a basis for solid R&D results. Pipettes are an essential tool for life science research. Thermal analysis instruments help to improve materials and their thermal behavior. Automated chemistry solutions accelerate the development of new chemicals.

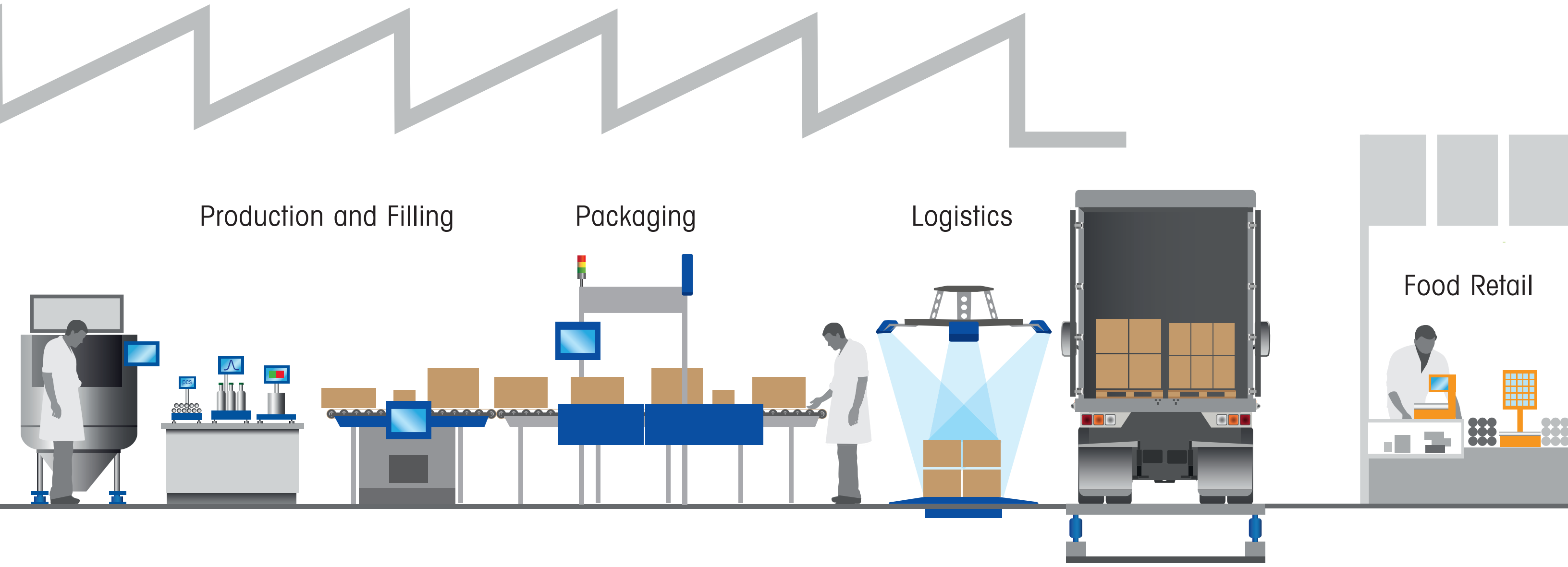
Quality Control Lab

Quality control relies on fast and precise analytical measurement as well as good data management. Our analytical balances, titrators, pH meters, density meters, refractometers, melting point meters, pipettes, and UV/VIS spectrophotometers can be tailored to each customer's application. Together with LabX software, our instruments provide a fully documented workflow for every quality control lab.

Scale-up and Production

Our sensors for measuring critical liquid analytical parameters, such as pH and oxygen levels and water conductivity and resistivity as well as total organic carbon, enable pharmaceutical, biotech, and other companies to continuously ensure product quality and meet regulatory standards. Our transmitters and connectivity solutions make data collection and integration into control systems efficient and flexible.





Production and Filling

We offer highly robust and durable industrial scales and terminals in all sizes, formats, and capabilities to monitor and control various manufacturing processes including applications for counting, formulation, and weight-based quality control. Software programs help increase productivity, improve product quality, and enhance the yield of manufacturing processes.

Packaging

Product inspection solutions help to safeguard product quality, safety, and integrity, inside and out. Our systems for metal detection, checkweighing, x-ray, and vision inspection provide confidence that product quality is maintained, compliance with industry standards is achieved, and consumers and brands are protected.

Logistics

Our vehicle scale systems offer the highest level of accuracy and can prevent unexpected downtime thanks to a unique design and remote diagnostics capabilities. For express and freight carriers, in-motion weighing and dimensioning solutions provide revenue recovery opportunities at highest throughputs and read rates.

Food Retail

From retailers' receiving docks to their checkout counters, we enhance efficient handling of fresh goods with weighing, packaging, pricing, wrapping, and labeling solutions. Connected scales greatly facilitate in-store marketing, fresh item management, promotions, and more.




Patrick Kaltenbach
President and
Chief Executive Officer

Dear Fellow Investors

2022 was another year where our company's unique strengths and culture of execution led to strong performance and success in overcoming significant external challenges. Our team's resilience and agility to quickly react and adapt to the changing environment allowed us to meet customer demand, gain market share, and deliver robust financial results.

We capitalized on continued good growth across most of our end markets and benefited from our customers' strong interest in our innovative solutions that support their needs for automation and digitalization. Our supply chain became an even greater competitive advantage as we were able to navigate sudden challenges like the war in Ukraine and lockdowns in China, while our productivity and pricing programs offset significant inflationary pressures. I am convinced the diligent execution of our initiatives and innovation in our products and sales and marketing will continue to serve us well in the future.

2022 Financial Highlights

We had exceptional performance across key financial metrics in 2022:

- Sales were $3.920 billion, an increase of 11% in local currency over 2021.
- Adjusted Operating Profit was $1.192 billion, reflecting growth of 13%. Our Adjusted Operating Profit margin exceeded 30% for the first time and expanded 190 basis points versus the prior year.
- Adjusted EPS was $39.65, up 17%. Adverse foreign currency is estimated to have reduced Adjusted EPS by approximately 6%.
- Free cash flow was $781 million.

Our local currency sales growth was excellent and included growth in most business areas and regions. We had robust local currency sales growth in the Americas and Asia and very good growth in Europe despite a headwind from ceasing shipments to Russia. We saw strong results from our Laboratory and Industrial businesses. Our Adjusted Operating Profit grew 13%, or 18% when excluding unfavorable foreign currency.

Our pricing program was highly effective in mitigating significant inflationary headwinds, while at the same time allowing us to strategically invest in R&D and other important areas. Our margin and productivity initiatives also helped us address inflationary challenges and a substantial currency headwind.

Free cash flow was negatively impacted by supply chain constraints, requiring us to hold a higher level of inventory than we had expected. Our agility in sourcing critical components, redesigning products, and effectively utilizing our global supply chain proved to be an important advantage as we were able to serve customers better than many of our competitors. Improving supply chain conditions should lead a return to more normal inventory levels in 2023.

Our strong operating results allowed us to make key investments in innovation, growth initiatives, and productivity improvements. We will continue to return our excess cash flow beyond our needs to shareholders through our share repurchase program.

Focused on Our Best Growth Opportunities

Our end markets were generally favorable in 2022, including very good growth across most markets and geographies. Our competitive position has grown stronger as we have enhanced our sophisticated sales and marketing programs that guide our sales teams to the most attractive growth opportunities.

Our sales and marketing organization executed extremely well, leveraging our Spinnaker program to help us target our most promising pockets of growth. Our team continues to reallocate resources to higher-potential end markets and opportunities in "hot" growth segments such as lithium batteries, semiconductors, and sustainable materials to name a few. Our sales teams have expanded our cross-selling efforts by using our growing portfolio of digital tools and resources such as eDemos, digital libraries, value selling guides, and eLearning that have been clear differentiators and facilitators of increased customer interaction.

Sales project alerts continued to be a great source of insights for our sales teams over the year. These TopK alerts provide tailored, actionable information about potential sales opportunities. The alerts are based on unique and proprietary data analytics and leverage our extensive data sources. We will make additional enhancements to the program this year.

We continue to expand our digital tools for customers including e-commerce solutions for digital stores and punch-out solutions for larger customers that simplify their purchasing processes. We also offer customer portals where customers can directly manage the products they buy from us, with tailored content manuals, software upgrades, guided support for services, and more. We will continue to add to this with smart solutions that can, for example, propose or schedule services for specific instruments or reorder consumables based on projected consumption. Our connected devices strategy with flexible and comprehensive interfacing capabilities empowers our customers' internet of things strategies, and our software solutions help them turn data into important insights.

Providing Exceptional Customer Service

Our Service business delivered excellent results in 2022. Our ability to continue to serve customers during these challenging past few years has led to steady increases in our Net Promoter Scores, which are customer evaluations of services after they are provided. Service remains an important contributor to our profits and a key competitive advantage as customers that utilize our service are more likely to purchase our instruments, and our service relationships give us meaningful insights into customer applications and future needs.

We have made good progress in recent years in selling service contracts at the point of sale. Our service contracts and calibration services help customers achieve full compliance with regulations, provide cost savings, and ensure product quality. Big data analytics is also helping drive growth in services through greater penetration of our installed base, while also enhancing productivity via territory optimization. We continue to see opportunities to further optimize our service processes to enhance our customers' experience, increase service productivity, and improve our people development.

Extending Our Leadership in Innovation

Innovation will always be at the forefront of all we do. Continued innovation expands our technology leadership, drives market share gains, and stimulates replacement demand. We lead our industry in innovation, and our product portfolio has never been stronger. New product development is important to our growth and margin expansion initiatives, and we have accelerated certain investments to capture these opportunities.

Recent innovations have been well received by customers that increasingly seek advanced solutions for enhancing automation, improving productivity, and increasing compliance with stringent data integrity requirements, both in the lab and production environment. Our R&D activities have been aimed directly at meeting these needs. Our Laboratory and Industrial businesses recently launched several new and updated products with a focus on automation, connectivity, and data integration features.

An excellent example is our new automated titration solution. Titration requires fast and precise handling of samples for analysis. Our solution enables automated sample preparation, precise dilution, and highly accurate dispensing, allowing for the continuous processing of complex workflows. Our industry-leading software, LabX, ensures that all data generated as part of workflow measurements are recorded in real time with a strong level of data integrity.

> The SevenDirect Advanced pH meters feature a large touchscreen, an EasyPlace sensor arm, unique buffer sachets, and a robust design that make them easy to use and keep clean.

Our new IND360 Automation Weight Indicator for production applications is an ultra-fast weighing terminal with pre-programmed applications for filling, dosing, and tank weighing. The instrument saves customers valuable engineering time and allows for rapid integration into their factory automation systems. Pharma/biopharma, food, and chemical are attractive end-user applications. These are just a few examples highlighting the innovation across our broad portfolio.

Turning Supply Chain Challenges Into a Competitive Edge

Unprecedented logistics and component availability challenges continued to plague our global supply chain in 2022; however, our team responded extremely well and supported customers with relatively minimal disruption. Our ability to continue to support customers has been a competitive advantage that has allowed us to gain additional market share and strengthen our brand.

SternDrive, our operational excellence program, also made good progress this year despite supply chain disturbances and delivered on its objectives of cost savings, improved operational performance, and higher customer satisfaction. The program mitigates cost pressures and continues to be a key source of operational excellence. Our upcoming Wave 3 launch will help us continue to invest for long-term growth, with advanced approaches around value engineering, strategic make or buy assessments, smart manufacturing, and back-office process automation.

Blue Ocean, our system and process harmonization program, is proving to be an important advantage as it allows real-time data and insights, which supported the success of our pricing and SternDrive programs in 2022. Through a single common platform, Blue Ocean provides us significant transparency to make better business decisions, faster. The rollout of Blue Ocean is nearing completion, with France launching this year and a handful of small units and recent acquisitions close behind. Blue Ocean is also a critical platform for us to scale new business models and enhance our digital solutions for customers.

Building on Our Strong ESG Track Record

We have long been committed to sustainable development across broad environmental, social, and governance (ESG) aspects through our GreenMT sustainability program. Recent major accomplishments include achieving carbon neutrality with respect to Scope 1 and 2 emissions and sourcing 100% renewable electricity.

While we have an excellent track record in ESG, we have set further ambitious targets for the future. In early 2022, we committed to absolute emission reduction targets, covering Scope 1, 2, and 3 emissions, consistent with the criteria issued by the Science Based Target initiative. Our sustainability efforts are positively recognized by the industry's most respected ratings agencies.

Our GreenMT program is also focused on making strides across important social and governance topics, including expanding the diversity of talent across our organization. We are excited about our progress and consider our sustainability efforts another example of how METTLER TOLEDO focuses on the long term to enhance the value of our franchise.

> With its unbreakable X-Chip, the InPro X1 is the first food-safe, in-line digital pH sensor that can withstand harsh cleaning processes without sacrificing accuracy or longevity.

Confidence in Our Amazing Team

METTLER TOLEDO is stronger than ever, and we remain focused on the things we can control through the diligent execution of our initiatives. I feel very good about the long-term growth opportunities across our key end markets, as well as our team's agility in pivoting to the most attractive pockets of growth in other segments. Our innovative product portfolio, excellent sales and marketing programs, and best-in-class operating initiatives give me great optimism in the future.

As we look ahead through 2023, we expect to face continued uncertainty in the global economy and challenging multi-year sales growth comparisons. Our ability to demonstrate resilience and agility during difficult times is an important signature of our culture. I am confident we will be able to react quickly to the new challenges and opportunities that arise so we can continue to gain share and deliver solid results.

We remain thankful for the faith our customers have placed in us as a trusted provider of innovative solutions. Deep gratitude also goes to our amazing global team of employees; we could not have achieved these exceptional results without their dedication and teamwork, which have been nothing short of remarkable and continue to define our unique culture. In short, I believe who we are is why we win!

We look forward to continuing METTLER TOLEDO's strong track record of growth, and we offer special thanks to you, our shareholders, for your continued support and confidence in our Company and our team.

Sincerely,

Patrick Kaltenbach
President and CEO

February 10, 2023

The IND360 is an ultra-fast weighing indicator that helps customers vastly improve productivity and quality and save engineering time in automated production processes such as filling and tank weighing.

Appendix

GAAP to Non-GAAP Measure Reconciliation

Dollars in Millions	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
GAAP consolidated net sales	**$2,342**	**$2,379**	**$2,486**	**$2,395**	**$2,508**	**$2,725**	**$2,936**	**$3,009**	**$3,085**	**$3,718**	**$3,920**
Local currency (LC) sales growth	**4%**	**1%**	**5%**	**3%**	**7%**	**8%**	**6%**	**5%**	**2%**	**18%**	**11%**
Foreign exchange impact	-3%	1%	-1%	-7%	-2%	1%	2%	-3%	1%	3%	-6%
Reported USD Sales Growth	**1%**	**2%**	**4%**	**-4%**	**5%**	**9%**	**8%**	**2%**	**3%**	**21%**	**5%**

Operating Margin % Reconciliation	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Earnings before tax (GAAP)	**$383**	**$403**	**$445**	**$463**	**$504**	**$574**	**$652**	**$681**	**$749**	**$949**	**$1,071**
Amortization	21	25	29	31	36	43	48	50	57	63	66
Interest expense	23	23	25	27	28	33	35	37	39	43	55
Restructuring charges	17	20	6	11	6	13	18	16	11	5	10
Other charges (income), net	1	3	2	(1)	8	(6)	(22)	(6)	(14)	(3)	(9)
Pension reclassification	(4)	(6)	(15)	(13)	(10)	0	0	0	0	0	0
Adjusted Operating Income (non-GAAP)	**$440**	**$467**	**$492**	**$519**	**$573**	**$657**	**$731**	**$778**	**$841**	**$1,058**	**$1,192**
Adjusted Operating Income % of Sales	**18.8%**	**19.6%**	**19.8%**	**21.7%**	**22.9%**	**24.1%**	**24.9%**	**25.9%**	**27.2%**	**28.5%**	**30.4%**

Earnings Per Share (EPS)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
GAAP earnings per share (EPS)	**$9.14**	**$9.96**	**$11.44**	**$12.48**	**$14.22**	**$14.24**	**$19.88**	**$22.47**	**$24.91**	**$32.78**	**$38.41**
Purchased intangible amortization, net of tax	$0.14	$0.12	$0.13	$0.14	$0.18	$0.27	$0.39	$0.43	$0.46	$0.70	$0.87
Restructuring charges, net of tax	$0.39	$0.49	$0.15	$0.30	$0.18	$0.38	$0.56	$0.50	$0.35	$0.18	$0.34
Acquisition (gain) cost, net of tax					$0.03	$0.05	($0.74)			$0.35	$0.03
Tax items (reform: US '17-'18, Swiss '19)						$2.73	$0.14	($0.63)			
Other		$0.01			$0.19	($0.10)	$0.09				
Adjusted EPS (non-GAAP)	**$9.67**	**$10.58**	**$11.72**	**$12.92**	**$14.80**	**$17.57**	**$20.32**	**$22.77**	**$25.72**	**$34.01**	**$39.65**

UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Form 10-K

(Mark One)

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

For the fiscal year ended December 31, 2022

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from to

Commission file number 001-13595

Mettler-Toledo International Inc.

(Exact name of registrant as specified in its charter)

Delaware	13-3668641
(State or other jurisdiction of incorporation or organization)	*(I.R.S. Employer Identification No.)*

1900 Polaris Parkway
Columbus, OH 43240
and
Im Langacher 44
CH 8606 Greifensee, Switzerland

(Address of principal executive offices) (Zip Code)

1-614-438-4511 and +41-44-944-22-11

(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol	Name of each exchange on which registered
Common Stock, $0.01 par value	MTD	New York Stock Exchange

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

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

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated 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. (Check one): Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

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

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

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

As of January 26, 2023 there were 22,106,175 shares of the registrant's Common Stock, $0.01 par value per share, outstanding. The aggregate market value of the shares of Common Stock held by non-affiliates of the registrant on June 30, 2022 (based on the closing price for the Common Stock on the New York Stock Exchange as of the last business day of the registrant's most recently completed second fiscal quarter, June 30, 2022) was approximately $25.9 billion. For purposes of this computation, shares held by affiliates and by directors of the registrant have been excluded. Such exclusion of shares held by directors is not intended, nor shall it be deemed, to be an admission that such persons are affiliates of the registrant.

Documents Incorporated by Reference

Document	Part of Form 10-K Into Which Incorporated
Certain Sections of the Proxy Statement for 2023 Annual Meeting of Shareholders	Part III

METTLER-TOLEDO INTERNATIONAL INC.
ANNUAL REPORT ON FORM 10-K
FOR THE FISCAL YEAR ENDED DECEMBER 31, 2022

FORWARD-LOOKING STATEMENTS DISCLAIMER

You should not rely on forward-looking statements to predict our actual results. Our actual results or performance may be materially different than reflected in forward-looking statements because of various risks and uncertainties, including statements about expected revenue growth, inflation, impacts of COVID-19 and ongoing developments related to Ukraine. You can identify forward-looking statements by terminology such as "may," "will," "could," "would," "should," "expect," "plan," "anticipate," "intend," "believe," "estimate," "predict," "potential," or "continue."

We make forward-looking statements about future events or our future financial performance, including earnings and sales growth, earnings per share, strategic plans and contingency plans, growth opportunities or economic downturns, our ability to respond to changes in market conditions, planned research and development efforts and product introductions, adequacy of facilities, access to and the costs of raw materials, shipping and supplier costs, gross margins, customer demand, our competitive position, pricing, capital expenditures, cash flow, tax-related matters, the impact of foreign currencies, compliance with laws, effects of acquisitions, and the impact of inflation, the COVID-19 pandemic and ongoing developments related to Ukraine on our business.

Our forward-looking statements may not be accurate or complete, and we do not intend to update or revise them in light of actual results. New risks also periodically arise. Please consider the risks and factors that could cause our results to differ materially from what is described in our forward-looking statements, including inflation, the uncertain duration and severity of the COVID-19 pandemic and ongoing developments related to Ukraine. See in particular "Factors Affecting Our Future Operating Results" and "Management's Discussion and Analysis of Financial Condition and Results of Operations."

PART I

Item 1. *Business*

We are a leading global supplier of precision instruments and services. We have strong leadership positions in all of our businesses and believe we hold global number-one market positions in most of them. We are recognized as an innovation leader and our solutions are critical in key research and development, quality control, and manufacturing processes for customers in a wide range of industries including life sciences, food, and chemicals. Our sales and service network is one of the most extensive in the industry. Our products are sold in more than 140 countries and we have a direct presence in approximately 40 countries. With proven growth strategies and a focus on execution, we have achieved a long-term track record of strong financial performance.

Our business is geographically diversified, with net sales in 2022 derived 26% from Europe, 40% from North and South America, and 34% from Asia and other countries. Our customer base is also diversified by industry and by individual end-customer.

Mettler-Toledo International Inc. was incorporated as a Delaware corporation in 1991 and became a publicly traded company with its initial public offering in 1997.

Business Segments

We have five reportable segments: U.S. Operations, Swiss Operations, Western European Operations, Chinese Operations, and Other. See Note 18 to the consolidated financial statements and Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations under "Results of Operations by Reportable Segment" for detailed results by segment and geographic region.

We manufacture a wide variety of precision instruments and provide value-added services to our customers. Our principal products and services are described below. We also describe our customers and distribution, sales and service, research and development, manufacturing, and certain other matters. These descriptions apply to substantially all of our products and related reportable segments.

Laboratory Instruments

We make a wide variety of precision laboratory instruments for sample preparation, synthesis, analytical bench top, material characterization, and in-line measurement. Our portfolio includes laboratory balances, liquid pipetting solutions, automated laboratory reactors including real-time analytics, titrators, pH meters, process analytics sensors and analyzer technology, physical value analyzers including density and refractometry instruments, thermal analysis systems, and other analytical instruments such as UV/VIS spectrophotometers and moisture analyzers. Our laboratory instruments have leading-edge embedded software and we also offer LabX, our laboratory software platform to manage and analyze data generated from our instruments. The laboratory instruments and related service business accounted for approximately 57% of our net sales in 2022, 56% in 2021, and 54% in 2020.

Laboratory Balances

Our laboratory balances have weighing ranges from one ten-millionth of a gram up to 64 kilograms. To respond to a wide range of customer needs and value/price points, we market our balances in a range of product tiers offering different levels of functionality. We also provide filter weighing and powder and liquid dosing automated systems. Based on the same weighing technology platform, we manufacture mass comparators, which are used by weights and measures officials as well as National Measurement Institute laboratories to ensure the accuracy of reference weights. Laboratory balances are primarily used in the pharmaceutical, biotechnology, testing labs, food, chemical, cosmetics, academia, and other industries.

Pipettes

Pipettes are used in life science research laboratories for dispensing small volumes of liquids. We develop, manufacture, and distribute advanced pipettes, including single- and multi-channel manual and electronic pipettes. We also develop and produce high-value consumables such as pipette tips. We maintain service centers in key markets where customers periodically send their pipettes for certified recalibrations. These service centers, combined with our advanced asset management solutions, provide our customers with innovative solutions to maintain their instruments and meet regulatory compliance. Our principal end-markets are pharmaceutical, biotech, and academia.

Analytical Instruments

Titrators measure the chemical composition of samples and are used in environmental and research laboratories as well as in quality control labs in the pharmaceutical, testing lab, food and beverage, and other industries. Our high-end titrators are multi-tasking models, which can perform two determinations simultaneously on multiple vessels. Our offering includes robotics to automate routine work in quality control applications.

Thermal analysis systems measure material properties as a function of temperature, such as weight, dimension, energy flow, and viscoelastic properties. Thermal analysis systems are used in nearly every industry, but primarily in plastics and polymer industries and academia and increasingly in the pharmaceutical industry.

pH meters measure acidity in laboratory samples. We also manufacture and sell density and refractometry instruments, which measure chemical concentrations in solutions. In addition, we manufacture and sell moisture analyzers, which precisely determine the moisture content of a sample by utilizing the loss on drying method, and UV/VIS spectrophotometers that optimize spectroscopic workflows.

Laboratory Software

LabX, our laboratory software platform, manages and analyzes data generated by our balances, titrators, pH meters, physical value analyzers, and other analytical instruments like UV/VIS spectrophotometers. LabX provides full network capability; assists with workflow automation; has efficient, intuitive protocols; and enables customers to collect and archive data in compliance with the U.S. Food and Drug Administration’s traceability and data integrity requirements for electronically stored data (also known as 21 CFR Part 11).

Automated Chemistry Solutions

Our automated chemistry solutions focus on select applications in the chemical and drug discovery process. Our automated lab reactors and in situ analysis systems are considered integral to the process development and scale-up activities of our customers. Our on-line measurement technologies, based on infrared and laser light scattering, enable customers to monitor chemical reactions and crystallization processes in real time in the lab and plant. In situ samples allow overnight sampling and testing. Additionally, we provide industry-leading software solutions that enable our customers to manage, optimize, and improve experiments as well as production scale-up. We believe that our portfolio of integrated technologies can bring significant efficiencies to the development process, enabling our customers to bring new drugs and chemicals to market faster.

Process Analytics

Our process analytics business provides instruments for the in-line measurement of liquid and gas parameters used primarily in the production process of pharmaceutical, biotech, beverage, microelectronics, chemical, and refining companies, as well as power plants. More than half of our process analytics sales are to the pharmaceutical and biotech markets, where our customers need fast and secure scale-up and production that meet the validation processes required for GMP (Good Manufacturing Processes) and other regulatory standards like the USP (U.S. Pharmacopoeia) regulations for ultrapure water quality.

We are a leading solution provider for liquid analytical measurement to control and optimize production processes. Our solutions include sensor and analyzer technology for measuring pH, dissolved oxygen, carbon dioxide, conductivity, turbidity, ozone, total organic carbons, pressure, bioburden, sodium, and silica, as well as laser analyzers for gas measurement. Intelligent sensor diagnostics capabilities enable improved asset management solutions for our customers to reduce process downtime and maintenance costs. Our instruments offer leading multi-parameter capabilities and plant-wide control system integration, which are key for integrated measurement of multiple parameters to secure production quality and efficiency. With a worldwide network of specialists, we support customers in critical process applications, compliance, and systems integration questions.

Industrial Instruments

We manufacture numerous industrial weighing instruments and related terminals and offer dedicated software solutions for the pharmaceutical, chemical, food, discrete manufacturing, and other industries. In addition, we manufacture metal detection, x-ray, checkweighing, and other end-of-line product inspection systems used in production and packaging. We supply automatic identification and data capture solutions, which integrate in-motion weighing, dimensioning, and identification technologies for transport, shipping, and logistics customers. We also offer heavy industrial scales and related software. The industrial instruments and related service business accounted for approximately 38% of our net sales in 2022, 39% in 2021, and 40% in 2020.

Industrial Weighing Instruments

We offer a comprehensive line of industrial scales and weighing devices, such as bench scales, floor scales, and weigh modules, for weighing loads from a few grams to several thousand kilograms in applications ranging from measuring materials in production to quality completeness control in manufacturing to weighing packages at the end of the line. Our products are used in a wide range of industrial applications, such as counting, formulating and mixing ingredients, and quality control.

Industrial Terminals

Our industrial scale terminals collect data and integrate it into manufacturing processes, helping to automate them. Our terminals allow users to remotely download formulation recipes or access setup data and can minimize downtime through predictive rather than reactive maintenance.

Transportation and Logistics

We supply automatic dimensional measurement and data capture solutions, which integrate in-motion weighing, dimensioning, and identification technologies. With these solutions, customers can measure the weight and cubic volume of packages for appropriate billing, load management, and quality control. Our solutions also integrate into customers' information systems.

Vehicle Scale Systems

Our primary heavy industrial products are scales for weighing trucks or railcars (i.e., weighing bulk goods as they enter or leave a factory or at a toll station). Heavy industrial scales are capable of measuring weights up to 500 tons and permit accurate weighing under extreme environmental conditions. We also offer advanced computer software that can be used with our heavy industrial scales to facilitate a broad range of customer solutions and provides a complete system for managing vehicle transaction processing.

Industrial Software

We offer software that can be used with our industrial instruments. Examples include FreeWeigh.Net, statistical quality control software; FormWeigh.Net, formulation/batching software; and DataBridge, which supports the operation of vehicle scales. FreeWeigh.Net and FormWeigh.Net provide full network capability and enable customers to collect and archive data in compliance with U.S. Food and Drug Administration requirements, 21 CFR Part 11.

Product Inspection

Increasing safety and consumer protection requirements are driving the need for more sophisticated end-of-line product inspection systems (e.g., for use in food processing and packaging, pharmaceutical, packaged consumer goods, and other industries). We are a leading global provider of metal detectors, x-ray systems, checkweighers, camera-based imaging equipment, and track-and-trace solutions that are used in these industries. Metal detectors are most commonly used to detect fine particles of metal that may be contained in raw materials or may be generated by the manufacturing process itself. X-ray inspection is used to detect metallic contamination in applications unsuited to metal detectors and many types of non-metallic contamination, such as glass, calcified bone, stones, and pits. Our x-ray systems are also used for mass control and for determining and controlling the fat content in meat. Checkweighers are used to control the filled weight of packaged goods such as food, pharmaceuticals, and cosmetics. Our camera-based vision inspection solutions provide in-line inspection of package quality, labels, and content, which are needs for food and beverage, consumer goods, and pharmaceutical companies. Vision inspection systems with associated specialist software enable our pharmaceutical customers to implement traceability and serialization tracking, as required by regulation.

All of our technologies are integrated with material handling systems to ensure the correct presentation of the customer's product to the device and the secure rejection of non-conforming product, and are frequently designed to comply with stringent hygiene standards. Our technologies may also be used together as components of integrated packaging lines. ProdX Inspect is our quality and productivity control software for helping customers comply with regulations and optimize process efficiency, either as a stand-alone solution or through integration with the customer's manufacturing and enterprise systems.

Retail Weighing Solutions

Supermarkets, hypermarkets, and other food retail businesses make use of multiple weighing and food labeling solutions for handling fresh goods (such as meats, vegetables, fruits, or cheeses). We offer networked scales and software, which can integrate backroom, counter, self-service, and checkout functions and can incorporate fresh goods item data into a supermarket's overall food item and inventory management system. In addition, we offer stand-alone scales for basic counter weighing and pricing, price finding, and printing. The customer benefits of our retail solutions are in the areas of enterprise-wide article and price management, merchandising, and regulatory compliance. In North America and select other markets, our offering also includes automated packaging and labeling solutions for the meat backroom, which are fully integrated with the scales in the store. The retail business accounted for approximately 5% of our net sales in both 2022 and 2021 and 6% in 2020.

Customers and Distribution

Our principal customers include companies in the following key end-markets: the life science industry (pharmaceutical and biotech companies, as well as independent research organizations and testing labs); food and beverage manufacturers; chemical, specialty chemicals, and cosmetics companies; the academic community; food retailers; the transportation and logistics industry; the metals industry; and the electronics industry.

Our products are sold through a variety of distribution channels. Generally, more technically sophisticated products are sold through our direct sales force, while less complicated products are sold through indirect channels. Our sales through direct channels exceed our sales through indirect channels. A significant portion of our sales in the Americas is generated through indirect channels, including sales of our Ohaus-branded products. Ohaus-branded products target markets, such as the educational market, in which customers are interested in lower cost, a more limited set of features, and less comprehensive support and service.

We have a diversified customer base, with no single end-customer accounting for more than 1% of 2022 net sales.

Sales and Service

Market Organizations

We maintain geographically focused market organizations around the world that are responsible for all aspects of our sales and service. The market organizations are customer-focused, with an emphasis on building and maintaining value-added relationships with customers in our target market segments. Each market organization has the ability to leverage best practices from other units while maintaining the flexibility to adapt its marketing and service efforts to account for different cultural and economic conditions. Market organizations also work closely with our producing organizations (described below) by providing feedback on manufacturing and product development initiatives, new product and application ideas, and information about key market segments.

We have one of the largest and broadest global sales and service organizations among precision instrument manufacturers we compete against. At December 31, 2022, our sales and service group consisted of approximately 9,100 employees in sales, marketing and customer service (including related administration), and post-sales technical service, located in approximately 40 countries. This field organization has the capability to provide service and support to our customers and distributors in major markets across the globe. This is important because our customers increasingly seek to do business with a consistent global approach.

Service

Our service business continues to be successful with a focus on providing uptime and calibration services, as well as further expanding our offerings to provide value-added services for a range of market needs, including regulatory compliance, performance enhancements, application expertise and training, and remote services. We have a unique offering to our pharmaceutical customers in promoting the use of our instruments in compliance with FDA and other international regulations, and we can provide these services to most customers' locations around the world. Our global service network is also an important factor in our ability to expand in emerging markets. We estimate that we have the largest installed base of weighing instruments in the world. Service (representing service contracts, on-demand services, and replacement parts) accounted for approximately 20% of our net sales in both 2022 and 2021 and 22% in 2020.

Beyond revenue opportunities, we believe service is a key part of our solution offering and helps significantly in customer retention. The close relationships and frequent contact with our large customer base allow us to be the trusted advisor of our customers, which provides us with high-quality sales opportunities as well as innovative product and application ideas.

Research and Development and Manufacturing

Producing Organizations

Our research, product development, and manufacturing efforts are organized into a number of producing organizations. Our focused producing organizations help reduce product development time and costs, improve customer focus, and maintain technological leadership. The producing organizations work together to share ideas and best practices, and there is a close interface and coordinated customer interaction among marketing organizations and producing organizations. We also have regional logistics hubs to satisfy customer delivery requirements while optimizing our logistics processes.

Research and Development

We continue to invest in product innovation to provide technologically advanced products to our customers for existing and new applications. Over the last three years, we have invested $487 million in research and development ($177 million in 2022, $170 million in 2021, and $140 million in 2020), which is approximately 5% of net sales for each year. Our research and development efforts fall into three categories:

- technology advancements, which generate new products or features and increase the value of our products. These advancements may be in the form of enhanced or new functionality, new applications for our technologies, more accurate or reliable measurement, additional software capability, or automation through robotics or other means.
- applications development to complement our products and provide complete solutions to our customers.
- cost reductions, which reduce the manufacturing cost of our products through better overall design and/or improve the ease of serviceability.

We devote a substantial proportion of our research and development budget to software development. This includes software to process the signals captured by the sensors of our instruments, application-specific software, and software that connects our solutions into customers' existing IT systems. We closely integrate research and development with marketing, manufacturing, and product engineering. We have approximately 1,600 employees in research and development and product engineering in countries around the globe.

Manufacturing

We are a worldwide manufacturer, with facilities principally located in China, Switzerland, the United States, Germany, the United Kingdom, and Mexico. We emphasize product quality in our manufacturing operations, and most of our products require very strict tolerances and exact specifications. We use an extensive quality control system that is integrated into each step of the manufacturing process. All major manufacturing facilities have achieved ISO 9001 certification. We believe that our manufacturing capacity is sufficient to meet our present and currently anticipated demand.

We generally manufacture critical components, which are components that contain proprietary technology. When outside manufacturing is more efficient, we contract with other manufacturers for certain nonproprietary components. We use a wide range of suppliers. We believe our supply arrangements are adequate and that there are no material constraints on the sources and availability of materials. From time to time, we may rely on a single supplier for all of our requirements of a particular component. Supply arrangements for electronic components are generally made globally.

Backlog; Seasonality

Our manufacturing turnaround time is generally short, which permits us to manufacture orders to fill for most of our products. Backlog is generally a function of requested customer delivery dates and is typically not longer than one to two months.

Our business has historically experienced a slight amount of seasonal variation, particularly the high-end laboratory instruments business. Traditionally, sales in the first quarter are slightly lower than, and sales in the fourth quarter are slightly higher than, sales in the second and third quarters. Fourth quarter sales have historically generated approximately 28% to 30% of our net sales. This trend has a somewhat greater effect on earnings before taxes than on net sales because fixed costs are generally incurred evenly across all quarters.

Employees

Our total global workforce was approximately 18,000, consisting of 16,400 employees and 1,600 temporary personnel, as of December 31, 2022, and includes approximately 6,400 in Europe, 5,200 in North and South America, and 6,400 in Asia and other countries.

We are proud of our corporate culture and our talented employees. We endeavor to continue to provide an attractive work environment and keep our employees fully engaged. We know that our future success depends on attracting, developing, and retaining the best employees. We promote equal opportunity and inclusiveness worldwide and value diversity in our global workforce, which reflects the diversity in the many communities in which we operate internationally. We employ people of more than 100 nationalities.

We promote diversity and we encourage all employees, inclusive of all our demographics, to take on more responsibilities and management positions. As of December 31, 2022, approximately 36% of our global employee headcount was female, with approximately 28% holding management positions. We place great emphasis on performance management, training, and developing our employees across all levels and regions. During 2022, approximately 97% of employees completed one or more training courses, including part-time and temporary personnel. Lastly, we have local safety programs in place in all relevant units, and select locations have implemented a certified work safety management system. Severe workplace accidents are rare and there has been one fatality from an occupational incident related to a motor vehicle accident in the past five years.

We believe our employee relations are good, and we have not suffered any material employee work stoppage or strike during the last five years. Approximately 9,000 employees are represented by collective bargaining or another arrangement organized to represent employee interests.

Sustainability

Sustainability touches all aspects of our business, from designing, sourcing, and producing our products, to selling and delivering them to our customers, to handling them at the end of their lifecycle. A sustainable mindset helps guide us to make the right decisions for our customers, employees, suppliers, shareholders, and the communities in which we operate our business. We want to manage our business sustainably to position the Company for long-term growth. More than 10 years ago, we launched our GreenMT program to pursue environmental, social, and governance priorities where we can have a significant positive impact. We do this in five key areas: (1) keeping our operations sustainable over the long term by ensuring we use resources efficiently, (2) helping our customers to be sustainable in their businesses by offering sustainable products and services, (3) promoting responsible practices within our supply chain, (4) ensuring an engaged workforce through fair, attractive, safe, and development-minded workplaces, and (5) following corporate governance best practices.

We have set a number of goals relating to our GreenMT sustainability program, including reducing our carbon footprint and other environmental, social, and governance goals. As an example, as of 2020, we achieved carbon neutrality with respect to Scope 1 and Scope 2 CO_2 emissions, and source 100% renewable electricity for all our operations. We also have goals relating to waste, including reducing our waste intensity by 20% and achieving zero waste to landfill, in each case by 2025. Furthermore, we are committed to greenhouse gas emission reduction targets in line with what the latest climate science deems necessary to meet the goals of the 2015 Paris Agreement on climate change. Our commitment includes near-term and long-term/net-zero targets approved by the Science Based Target initiative (SBTi). We report annually on our progress related to sustainability topics in our Corporate Responsibility Report, available on www.mt.com/sustainability.

Blue Ocean Program

Blue Ocean refers to our program to establish a global operating model with standardized, automated, and integrated processes and high levels of global data transparency. It encompasses an enterprise architecture, with a global, single-instance ERP system. Within our IT systems, we continue to move toward integrated, homogeneous applications and common data structures. We also are largely standardizing our key business processes. The implementation of the systems and processes has been proceeding on a staggered basis over a multi-year period. We have implemented the Blue Ocean program in our operations in the U.S., China, most of Asia Pacific, and a significant portion of Europe including Switzerland, Germany, U.K., Benelux, and Spain. We estimate that we have more than 85% of our users on the program, and we will continue to implement additional locations and functionality over the coming years.

Intellectual Property

We hold over 5,400 patents and trademarks (including pending applications), primarily in the United States, Switzerland, China, the European Union, Germany, the United Kingdom, Italy, France, Japan, South Korea, Brazil, and India. Our products generally incorporate a wide variety of technological innovations, some of which are protected by patents of various durations. Products are generally not protected as a whole by individual patents, and as a result, no one patent or group of related patents is material to our business. We have numerous trademarks, including the Mettler-Toledo name and logo, which are material to our business. We regularly protect against infringement of our intellectual property.

Regulation

Our products are subject to various regulatory standards and approvals by weights and measures regulatory authorities. All of our electrical components are subject to electrical safety standards. We believe that we are in compliance in all material respects with applicable regulations.

Approvals are required to ensure our instruments do not impermissibly influence other instruments and are themselves not affected by other instruments. In addition, some of our products are used in "legal for trade" applications, in which prices based on weight are calculated and for which specific weights and measures approvals are required. Although there are a large number of regulatory agencies across our markets, there is an increasing trend toward harmonization of standards, and weights and measures regulation is harmonized across the European Union.

Our products may also be subject to special requirements depending on the end-user and market. For example, laboratory customers are typically subject to Good Laboratory Practices (GLP), industrial customers to Good Manufacturing Practices (GMP), pharmaceutical customers to U.S. Food and Drug Administration (FDA) regulations, and customers in food processing industries may be subject to Hazard Analysis and Critical Control Point (HACCP) regulations. Products used in hazardous environments may also be subject to special requirements.

Environmental Matters

We are subject to environmental laws and regulations in the jurisdictions in which we operate. We own or lease a number of properties and manufacturing facilities around the world. Like many of our competitors, we have incurred, and will continue to incur, capital and operating expenditures and other costs in complying with such laws and regulations.

We are currently involved in, or have potential liability with respect to, the remediation of past contamination in certain of our facilities. A former subsidiary of Mettler-Toledo, LLC known as Hi-Speed Checkweigher Co., Inc. was one of two private parties ordered by the New Jersey Department of Environmental Protection, in an administrative consent order signed on June 13, 1988, to investigate and remediate certain ground water contamination at a property in Landing, New Jersey. After the other party under this order failed to fulfill its obligations, Hi-Speed became solely responsible for compliance with the order. Residual ground water contamination at this site is now within a Classification Exception Area which the Department of Environmental Protection has approved and within which the Company oversees monitoring of the decay of contaminants of concern. A concurrent Well Restriction Area also exists for the site. The Department of Environmental Protection does not view these vehicles as remedial measures, but rather as "institutional controls" that must be adequately maintained and periodically evaluated. We estimate that the costs of compliance associated with the site over the next several years will be approximately a total of $0.4 million.

In addition, certain of our present and former facilities have or had been in operation for many decades and, over such time, some of these facilities may have used substances or generated and disposed of wastes that are or may be considered hazardous. It is possible that these sites, as well as disposal sites owned by third parties to which we have sent wastes, may in the future be identified and become the subject of remediation. Although we believe that we are in substantial compliance with applicable environmental requirements and, to date, we have not incurred material expenditures in connection with environmental matters, it is possible that we could become subject to additional environmental liabilities in the future that could have a material adverse effect on our financial condition, results of operations, or cash flows.

Competition

Our markets are highly competitive. Many of the markets in which we compete are fragmented both geographically and by application, particularly the industrial and food retailing markets. As a result, we face numerous regional or specialized competitors, many of which are well established in their markets. For example, some of our competitors are divisions of larger companies with potentially greater financial and other resources than our own. In addition, some of our competitors are domiciled in emerging markets and may have a lower cost structure than ours. We are confronted with new competitors in emerging markets which, although relatively small in size today, could become larger companies in their home markets. Given the sometimes significant growth rates of these emerging markets, and in light of their cost advantage over developed markets, emerging market competitors could become more significant global competitors. Taken together, the competitive forces present in our markets can impair our operating margins in certain product lines and geographic markets.

We expect our competitors to continue to improve the design and performance of their products and to introduce new products with competitive prices. Although we believe that we have technological and other competitive advantages over many of our competitors, we may not be able to realize and maintain these advantages. These advantages include our worldwide market leadership positions; our global brand and reputation; our track record of technological innovation; our comprehensive, high-quality solution offering; our global sales and service offering; our large installed base of instruments; and the diversification of our revenue base by geographic region, product range, application, and customer. To remain competitive, we must continue to invest in research and development, sales and marketing, customer service and support, and operational excellence throughout our supply chain. We cannot be sure that we will have sufficient resources to continue to make these investments or that we will be successful in identifying, developing, and maintaining any competitive advantages.

We believe the principal competitive factors in developed markets for purchasing decisions are the product itself, application support, service support, and price. In emerging markets, where there is greater demand for less sophisticated products, price is a more important factor than in developed markets. Competition in the U.S. laboratory market is also influenced by the presence of large distributors that sell not only our products but those of our competitors as well.

Company Website and Information

You can find our website on the internet at www.mt.com. The website contains information about us and our operations. The information contained on our website is not included in, or incorporated by reference into, this annual report on Form 10-K. You can view and download free of charge copies of each of our filings with the SEC on Form 10-K, Form 10-Q, Form 8-K, and Schedule 14A and all amendments to those reports by accessing www.mt.com, clicking on *About Us, Investor Relations,* and then clicking on *SEC Filings.* The SEC maintains a website at https://www.sec.gov that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC.

Our website also contains copies of the following documents that you can download free of charge:

- Corporate Governance Guidelines
- Audit Committee Charter
- Compensation Committee Charter
- Nominating and Corporate Governance Committee Charter
- Code of Conduct
- Equal Employment Opportunity Policy
- Business Partner Code of Conduct
- Ethical, Social, and Quality Standards
- Corporate Responsibility Report
- Environmental Policy
- Political Participation Policy
- Conflict Mineral Report
- Statement on Slavery, Human Trafficking, and Transparency in the Supply Chain

You can also obtain in print, free of charge, any of the above documents and any of our reports on Form 10-K, Form 10-Q, Form 8-K, and Schedule 14A and all amendments to those reports by sending a written request to our Investor Relations Department:

Investor Relations
Mettler-Toledo International Inc.
1900 Polaris Parkway
Columbus, OH 43240 U.S.A.
Phone: +1 614 438 4794
Email: adam.uhlman@mt.com

Item 1A. *Risk Factors*

Factors Affecting Our Future Operating Results

Operational Risks

The COVID-19 pandemic has adversely affected, and may continue to adversely affect, various aspects of our business, such as our workforce and supply chain, and make it more difficult and expensive to meet our obligations to our customers, and has adversely affected the global economy, which in turn can adversely affect our global business, results of operations, and financial condition.

Our global operations expose us to risks associated with public health crises that could have an adverse effect on our business results and financial condition.

For instance, the coronavirus pandemic (COVID-19) has spread globally in all countries where we do business. COVID-19 continues to evolve and has led to the implementation of various responses, including government-imposed quarantines, stay-at-home orders and lockdowns, travel restrictions, vaccination and testing requirements, and other public health safety measures. The emergence of COVID-19 variants and subvariants, such as Omicron, has presented particular challenges to the global economy given the high level of transmissibility, which can cause many people to be affected at the same time or over a short period of time. For example, the Chinese government eased its "zero COVID" policy in December 2022, and China has experienced a significant increase in COVID-19 cases.

Our global operations could be negatively affected if our employees, such as in China, become ill as a result of exposure to COVID-19, are subject to governmental stay-at-home orders, lockdowns, facility closures, reduction in operating hours, staggered shifts or other social distancing efforts, labor shortages, or if they are quarantined. The pandemic may continue to interfere with general commercial activity related to our supply chain and customer base, including in China given the status of the pandemic there.

The COVID-19 pandemic has resulted and may continue to result in significant disruptions to the global economy, as well as to businesses and capital markets globally. As the pandemic continues, we may experience volatility in our results, including reduced global sales volume from lower customer demand. Our supply chain has faced wide-ranging global challenges during the pandemic, including the availability of certain components, material shortages, supplier delays, transportation delays, and higher transportation and material costs.

Global inflation also has significantly increased related to the COVID-19 economic recovery and associated disruptions in global demand, logistics, and labor markets. These inflationary conditions could have a negative impact on our operating results in future years. Disruptions in labor markets, including a new competitive landscape created by remote work capabilities, could also lead to higher attrition, increased compensation levels, and longer recruiting cycles.

Uncertainties and challenges related to COVID-19, including new variants and subvariants, the status of the pandemic in China, logistical and inflationary challenges, potential lockdowns and the resulting impact to the economy continue in all regions of the world, and market conditions may change quickly. While it is difficult to estimate the extent and duration of any COVID-19 implications, the effects on our business, results of operations, and financial condition could be material.

We sell primarily to companies in developed countries. An economic downturn in these countries could hurt our operating results.

Most of our business is derived from companies in developed countries. Economic uncertainty in many parts of the world, including the impact from governmental monetary policies and related rising interest rates to combat inflation, the war in Ukraine, regional effects of the COVID-19 pandemic, international trade disputes, and sovereign debt levels in the European Union and the United States, are situations that we monitor closely. If developed countries were to experience slow growth or recession, we could see the following effects:

- a drop in demand for our products;
- companies being unable to finance their businesses;
- difficulty in obtaining materials and supplies;
- potential devaluation and/or impairment of assets;
- difficulty in collecting accounts receivables;
- an increase in accounts receivable write-offs; and
- greater foreign exchange rate volatility affecting our profitability and cash flow.

Economic downturns or recessions adversely affect our operating results because our customers often decrease or delay capital expenditures. Customers may also purchase lower-cost products made by competitors and not resume purchasing our products even after economic conditions improve. These conditions would reduce our revenues and profitability.

In addition, a potential financial crisis on financial institutions globally would likely have an adverse effect on the global capital markets and our business.

We are subject to certain risks associated with our international operations, including our significant concentration of business in China, and ongoing developments related to Russia and Ukraine.

We conduct business in many countries, including emerging markets in Asia, Latin America, and Eastern Europe, and these operations represent a significant portion of our sales and earnings. For example, our Chinese operations accounted for 21% of sales to external customers, approximately 36% of our global production, and 36% of total segment profit during 2022. In addition to the currency risks discussed below, international operations pose other substantial risks and problems for us, including the following:

- China's COVID-19 re-opening and related easing of its "zero COVID" policy (see page 14)
- local tariffs and trade barriers;
- additions or revisions to a country's legal and regulatory requirements;
- difficulties in staffing and managing local operations and/or mandatory salary increases;
- credit risks arising from financial difficulties facing local customers and distributors;
- difficulties in protecting intellectual property;
- nationalization of private enterprises which may result in the confiscation of assets, as we hold significant assets around the world in the form of property, plant, and equipment, inventory, and accounts receivable, as well as $50.7 million of cash at December 31, 2022 in our Chinese subsidiaries;
- restrictions on investments and/or limitations regarding foreign ownership;
- adverse tax consequences, including tax disputes and imposition or increase of withholding and other taxes on remittances and other payments by subsidiaries;
- the adoption of new or expansion of current travel restrictions or the intensification of trade wars;
- domestic purchasing requirements that could favor local competition;

- other uncertain local economic, political, and social conditions, including inflation, hyper-inflation, and other decreases in purchasing power, or periods of low or no productivity growth;
- credit tightening or reduction in credit availability for local customers; and
- results in China and emerging markets can be volatile and change quickly.

We must also comply with regulations regarding the conversion and repatriation of funds earned in local currencies. For example, we need government approval to convert earnings from our operations in China into other currencies and to repatriate these funds. If we cannot comply with these or other applicable regulations or these regulations are amended to make it more difficult to repatriate the funds, we may face increased difficulties in using cash generated in China.

We are required to comply with various import, export control, and economic sanctions laws, which may affect our transactions with certain customers, business partners, and other persons, including in certain cases dealings with or between our employees and subsidiaries. We address below the topic of economic sanctions laws related to Russia's invasion of Ukraine, which commenced in February 2022. In certain circumstances, export control and economic sanctions regulations may prohibit the export of certain products, services, and technologies, and in other circumstances, we may be required to obtain an export license before exporting a controlled item. Failure to comply with any regulations and sanctions could result in civil and criminal actions, monetary and non-monetary penalties, disruptions to our business, limitations on our ability to import and export products and services, and damage to our reputation.

In response to Russia's invasion of Ukraine in 2022, and as referenced above, the U.S., the European Union, and certain other countries imposed economic sanctions on Russian financial institutions, businesses in Russia, and on Russian interests and individuals, and the Russian government implemented sanctions and regulations in response. We continue to monitor the ongoing developments related to Ukraine, as well as the status of all applicable sanctions.

We have remained in close contact with our employees in Ukraine and have provided financial assistance and supplies to them. We suspended all shipments to Russia since the beginning of the invasion in February 2022. For historical reference, in 2021, approximately 1% of our net sales were in Russia and Ukraine, and we had an immaterial amount of assets and liabilities in both countries as of December 31, 2022 and 2021. We also do not have manufacturing in Russia or Ukraine.

Due to the impact of reduced energy supplies from Russia, the Council of the European Union (EU Council) proposed that all European member states strive for a voluntary 15% reduction in gas consumption compared to their average consumption over the last five years. The reduction timeframe commenced August 1, 2022 and is expected to continue through March 31, 2023. Accordingly, the availability and cost of energy may be impacted.

While it is difficult to estimate the impact of the ongoing invasion on the global economy, including increased inflation, higher energy and transportation costs and potential energy shortages, the invasion of Ukraine could adversely impact our financial results and presents several risks to our business. Also, uncertainties related to this conflict and the resulting impact to the global economy and market conditions can change quickly.

Our business and financial performance may be adversely affected by a cybersecurity attack.

We rely on our technology infrastructure to interact with suppliers, sell our products and services, fulfill orders, support our customers, and bill, collect, and make payments. Our internally developed system and processes, as well as those provided by third-party vendors, may be susceptible to damage or interruption from cybersecurity incidents, such as terrorist or hacker attacks, the introduction of malicious computer viruses, ransomware, falsification of banking and other information, insider risk, or other security breaches. If there is a cybersecurity incident, we may suffer interruptions in service, loss of assets or data, or reduced functionality. Many of our systems are not redundant, and our disaster recovery planning is not sufficient for every eventuality a cybersecurity incident could cause. Security breaches of our systems which allow inappropriate access to or inadvertent transfer of information and misappropriation or unauthorized disclosure of confidential information belonging to us or to our employees, customers, or suppliers could result in our suffering significant financial and reputational damage.

Customers may use our products and/or software to generate or manage critical information. Though we take steps to ensure our products and/or software are secure, it is possible that a cyber attack could result in the loss or compromise of critical information. If a customer alleges that a cyber attack causes or contributes to a loss or compromise of critical information, whether or not caused by us, we could face harm to our reputation and financial condition.

While we attempt to mitigate cybersecurity risks by employing a number of proactive measures, including mandatory quarterly ongoing employee training and awareness, technical security controls, enhanced data protection, and maintenance of backup and protective systems, our systems remain potentially vulnerable to cybersecurity threats, any of which could have a material adverse effect on our business. We believe our mitigation measures reduce, but cannot eliminate, the risk of a cybersecurity incident. Despite any precautions we may take, a cybersecurity incident could harm our reputation and financial condition and cause us to incur legal liability and increased costs to respond to such events. Our cyber liability insurance may not be sufficient to compensate us for losses that may result from interruptions in our services or asset or data loss as a result of cybersecurity incidents.

In addition, regulatory or legislative action related to cybersecurity, privacy, and data protection worldwide, such as the European General Data Protection Regulation which went into effect in May 2018, may increase the costs to develop, implement, or secure our products or services. We expect cybersecurity regulations to continue to evolve and be costly to implement. If we violate or fail to comply with such regulatory or legislative requirements, we could be fined or otherwise sanctioned, and such fines or penalties could have a material adverse effect on our business and operations.

We are vulnerable to system failures and data loss risks, which could harm our business.

We rely on our technology infrastructure to interact with suppliers, sell our products and services, support our customers, fulfill orders, and bill, collect, and make payments. Our systems are vulnerable to damage or interruption from natural disasters, power loss, telecommunication failures, malicious employees or employee negligence, computer viruses, and other events. When we upgrade or change systems, we may suffer interruptions in service, loss of data, or reduced functionality. A significant number of our systems are not redundant, and our disaster recovery planning is not sufficient for every eventuality. Despite any precautions we may take, such problems could result in interruptions in our services, fraudulent or negligent loss of assets, or unauthorized disclosure of confidential information, which could harm our reputation and financial condition. Our business interruption insurance may not be sufficient to compensate us for losses that may result from interruptions in our services or data loss as a result of system failures.

Customers may use our products and/or software to generate or manage confidential information. Though we take steps to ensure our products and/or software are secure, it is possible customers could lose confidential information stored on our products. If a customer alleges system failures in our products and/or software cause or contribute to a loss, whether or not caused by us, we could face harm to our reputation and our financial condition and legal liability.

We have also been implementing our Blue Ocean program to globalize our business processes and information technology systems that includes the implementation of a Company-wide enterprise resource planning system. This has been proceeding on a staggered basis over a multi-year period. We have implemented the program in our operations in the U.S., China, most of Asia Pacific, and a significant portion of Europe including Switzerland, Germany, U.K., Benelux, and Spain. We estimate that we have more than 85% of our users on the program and will continue to implement additional locations and functionality over the coming years. If our implementation is flawed, we could suffer interruptions in operations and customer-facing activities that could harm our reputation and financial condition or cause us to lose data, experience reduced functionality, or have delays in reporting financial information. It may take us longer to implement the program than we have planned, and the project may cost us more than we have estimated, either of which would negatively impact our ability to generate cost savings or other efficiencies. In addition, the program has increased our reliance on a single information technology system, which would have greater consequences should we experience a system disruption.

Our ability to manufacture and deliver products and services may be disrupted.

We have key manufacturing facilities located in China, Europe, and the United States. Many of our products are developed and manufactured at single locations, with limited alternate facilities. In addition, a large portion of our products and spare parts are distributed through regional logistics centers, in which certain logistics activities are outsourced to third parties. If we experience any significant disruption in these facilities for any reason, such as the COVID-19 pandemic described on page 14, global supply chain and production issues, strikes or other labor unrest, power interruptions, cybersecurity attacks, fire, earthquakes, hurricanes, floods, rising water levels, other weather events or natural disasters (including the potential impacts of climate change), or other events beyond our control, we may be unable to satisfy customer demand for our products or services resulting in lost sales. It may be expensive to resolve these issues, even though some of these risks are covered by insurance policies. More importantly, customers may switch to competitors and may not return to us even if we resolve the interruption.

Our business would suffer if we were unable to obtain supplies of material.

We purchase most of our raw materials, components, and supplies from multiple suppliers. Some items are purchased from a limited or single source of supply, and disruption of these sources whether as a result of issues with our suppliers' operation or the timely availability of shipments from freight carriers could affect our ability to manufacture products. The COVID-19 pandemic has caused numerous disruptions to supply chains, often resulting in delivery delays, inflated costs, and increases in shipping rates. Even where multiple sources of materials and components are available, the quality of the alternative materials, regulatory and contractual requirements to qualify materials for use in manufacturing, and the time required to establish new relationships with reliable suppliers could result in manufacturing delays and possible loss of sales. If we are unable to obtain materials or components for an extended time, this could damage our customer relationships and harm our financial condition or results of operations.

Our product development efforts may not produce commercially viable products in a timely manner.

If we do not introduce new products and enhancements, our products could become technologically obsolete over time, which would harm our operating results. To remain competitive, we must continue to make significant investments in research and development, sales and marketing, customer service and support, and operational excellence throughout our supply chain. We cannot be sure that we will have sufficient resources to continue to make these investments. In developing new products, we may be required to make substantial investments before we can determine their commercial viability. As a result, we may not be successful in developing new products and we may never realize the benefits of our research and development activities.

We face risks related to sales through distributors and other third parties that we do not control, which could harm our business.

We sell some products through third parties, including distributors and value-added resellers. This exposes us to various risks, including competitive pressure, concentration of sales volumes, credit risks, and compliance risks. We may rely on one or a few key distributors for a product or market, and the loss of these distributors could reduce our revenue and net earnings. Distributors may also face financial difficulties, including bankruptcy, which could harm our collection of accounts receivables. Violations of the FCPA or similar anti-bribery laws by distributors or other third-party intermediaries could materially impact our business. In addition to financial risk, actions of some of our distributors could cause reputational harm, especially if our products are involved. Risks related to our use of distributors may reduce sales, increase expenses, and weaken our competitive position.

Departures of key employees could impair our operations.

Key employees could leave the Company. If any key employees stopped working for us, our operations could be harmed. Important R&D personnel may leave and join competitors, which could substantially delay or hinder ongoing development projects. We have no key man life insurance policies with respect to any of our senior executives.

Our business involves certain operating risks, and our insurance may not be adequate to cover all insured losses of liabilities we might incur in our operations.

We have procured various insurance policies for certain types of insurance coverage and in varying coverage amounts. Our insurance may not be adequate to cover all losses or liabilities that we might incur in our operations. Furthermore, our insurance may not adequately protect us against liability from all of the hazards of our business. As a result of market conditions, premiums and deductibles for certain of our insurance policies may substantially increase. In some instances, certain insurance could become unavailable or available only for reduced amounts of coverage. We also are subject to the risk that we may be unable to maintain or obtain insurance of the type and amount we desire at a reasonable cost. If we were to incur a significant liability for which we were uninsured or for which we were not fully insured, it could have a material adverse effect on our financial position, results of operations, and cash flows.

Strategic Risks

A prolonged downturn or additional consolidation in the pharmaceutical, food and beverage, and chemical industries could adversely affect our operating results. A reduction in the capital resources or government funding of our customers could reduce our sales.

Our products are used extensively in the pharmaceutical, food and beverage, and chemical industries. Consolidation in these industries hurt our sales in the past. A prolonged global economic downturn, a downturn affecting one or more of these industries, or additional consolidation in any of these industries could adversely affect our operating results. In addition, the capital spending policies of our customers in these and other industries are based on a variety of factors we cannot control, including the resources available for purchasing equipment, the spending priorities among various types of equipment, and policies regarding capital expenditures. Any decrease or delay in capital spending by our customers would cause our revenues to decline and could harm our profitability. A decline in government funding of research or education could reduce some customers’ ability to purchase our products.

We operate in highly competitive markets, and it may be difficult for us to preserve operating margins, gain market share, and maintain a technological advantage.

Our markets are highly competitive. Many are fragmented both geographically and by application, particularly the industrial and food retailing markets. As a result, we face numerous regional or specialized competitors, many of which are well established in their markets. In addition, some of our competitors are divisions of larger companies with potentially greater financial and other resources than our own. There has also been an increase in the consolidation of precision instrument companies in recent years. Any consolidation within our market could result in competitors becoming larger and having greater financial and other resources than our own. Some of our competitors are domiciled or operate in emerging markets and may have a lower cost structure than ours. We are confronted with new competitors in emerging markets which, although relatively small in size today, could become larger companies in their home markets. Given the sometimes significant growth rates of these emerging markets, and in light of their cost advantage over developed markets, emerging market competitors could become more significant global competitors. Taken together, the competitive forces present in our markets could harm our operating margins. We expect our competitors to continue to improve the design and performance of their products and to introduce new products with competitive prices. Although we believe that our products and services have advantages over our competitors, we may not be able to realize and maintain these advantages.

We may face risks associated with future acquisitions.

We may pursue acquisitions of complementary product lines, technologies, or businesses. Acquisitions involve numerous risks, including difficulties in integrating the acquired operations, technologies, and products; diversion of management's attention from other business concerns; and potential departures of key employees of the acquired company. If we successfully identify acquisitions in the future, completing such acquisitions may result in new issuances of our stock that may be dilutive to current owners, increases in our debt and contingent liabilities, and additional amortization expense related to intangible assets. Any of these acquisition-related risks could have a material adverse effect on our profitability.

Larger companies have identified life sciences and instruments as businesses they will consider entering or expanding their presence, which could change the competitive dynamics of these markets. In addition, we may not be able to identify, successfully complete, or integrate potential acquisitions in the future. Even if we can do so, we cannot be sure that these acquisitions will have a positive impact on our business or operating results. We are also required to estimate the fair value of certain assets acquired or liabilities assumed. Such fair values may be based on valuation models which are subject to inherent uncertainties and our judgments regarding certain assumptions.

Financial Risks

Currency fluctuations affect our operating profits.

Our earnings are affected by changing exchange rates. We are particularly sensitive to changes in the exchange rates between the Swiss franc, euro, Chinese renminbi, and U.S. dollar. We have more Swiss franc expenses than we do Swiss franc sales because we develop and manufacture products in Switzerland that we sell globally and have a number of corporate functions located in Switzerland. When the Swiss franc strengthens against our other trading currencies, particularly the U.S. dollar and euro, our earnings go down. We also have significantly more sales in the euro than we do expenses. When the euro weakens against the U.S. dollar and Swiss franc, our earnings also go down. We estimate a 1% strengthening of the Swiss franc against the euro would reduce our earnings before tax by approximately $1.8 million to $2.0 million annually.

We also conduct business throughout the world, including Asia Pacific, the United Kingdom, Eastern Europe, Latin America, and Canada. Fluctuations in these currency exchange rates against the U.S. dollar can also affect our operating results. The most significant of these currency exposures is the Chinese renminbi. The impact on our earnings before tax of the Chinese renminbi weakening 1% against the U.S. dollar is a reduction of approximately $3.7 million to $4.2 million annually.

In addition to the effects of exchange rate movements on operating profits, our debt levels can fluctuate due to changes in exchange rates, particularly between the U.S. dollar, the Swiss franc, and euro. Based on our outstanding debt at December 31, 2022, we estimate that a 5% weakening of the U.S. dollar against the currencies in which our debt is denominated would result in an increase of $34.6 million in the reported U.S. dollar value of our debt.

Inflation can impact our operating results and the global economy.

Inflation affects the costs of goods and services that we use, including raw materials to manufacture our products, as well as transportation and logistical costs and other external costs and services. Inflation also affects labor costs, which are a significant element of our overall cost structure.

Inflation also leads to increased interest rates as country monetary policies combat inflation. This can result in reduced economic growth and recessionary conditions, as well as higher borrowing costs.

Global inflation significantly increased in 2022 and 2021 related to the COVID-19 economic recovery and associated disruptions in global demand, supply chains/logistics, and labor markets, as well as the war in Ukraine and related significant increase in energy costs.

These inflationary conditions could have a greater impact on our operating results in future years, including the impact of a potential European energy crisis, which could also negatively impact demand in certain customer segments that are more energy dependent such as customers in the chemical industry.

The pace of inflationary changes can also occur more quickly than our ability to respond with corresponding price increases, and cost optimization or reduction measures. In addition, there may be differences in inflation rates between countries where we incur the major portion of our costs and other countries where we sell products, which may limit our ability to recover increased costs. The competitive environment in which we operate may also limit our ability to recover higher costs through increased selling prices.

Historically, we also have experienced higher inflation in China, Eastern Europe, India, and Brazil. To date, these inflationary conditions have not had a material effect on our operating results. However, as our presence in China, Eastern Europe, India, and Brazil increases, these inflationary conditions could have a greater impact on our operating results.

We may experience impairments of goodwill or other intangible assets.

As of December 31, 2022, our consolidated balance sheet included goodwill of $660.2 million and other intangible assets of $306.1 million.

Our business acquisitions typically result in goodwill and other intangible assets, which affect the amount of future period amortization expense and possible impairment expense. We make estimates and assumptions in valuing such intangible assets that affect our consolidated financial statements.

In accordance with U.S. GAAP, our goodwill and indefinite-lived intangible assets are not amortized, but are evaluated for impairment annually in the fourth quarter, or more frequently if events or changes in circumstances indicate that an asset might be impaired. The evaluation may be based on valuation models that estimate fair value. In preparing the valuation models, we consider a number of factors, including operating results, business plans, economic conditions, future cash flows, and transaction and market data.

There are inherent uncertainties related to these factors and our judgment in applying them to the impairment analyses. The significant estimates and assumptions within our fair value models include sales growth, controllable cost growth, perpetual growth, effective tax rates, and discount rates. Our assessments to date have indicated that there has been no impairment of these assets.

Should any of these estimates or assumptions change, or should we incur lower-than-expected operating performance or cash flows, including from a prolonged economic slowdown, we may experience a triggering event that requires a new fair value assessment for our reporting units, possibly prior to the required annual assessment. These types of events and resulting analysis could result in impairment charges for goodwill and other indefinite-lived intangible assets if the fair value estimate declines below the carrying value.

Our amortization expense related to intangible assets with finite lives may materially change should our estimates of their useful lives change.

Concerns regarding the Eurozone debt levels and market perception related to the instability of the euro could affect our operating profits.

We conduct business in many countries that use the euro as their currency (the Eurozone). In the past, there have been concerns regarding the debt burden of certain Eurozone countries and their ability to meet future financial obligations. In addition, concerns in recent years have existed regarding the overall stability of the euro and the suitability of the euro as a single currency given the diverse economic and political circumstances in individual Eurozone countries.

These concerns could lead to the re-introduction of individual currencies in one or more Eurozone countries or, in more extreme circumstances, the possible dissolution of the euro currency entirely. Should the euro dissolve entirely, the legal and contractual consequences for holders of euro-denominated obligations would be determined by laws in effect at such time. These potential developments, or market perceptions concerning these and related issues, could adversely affect the value of our euro-denominated assets and obligations. In addition, concerns over the effect of this type of financial crisis on financial institutions in Europe and globally could have an adverse effect on the global capital markets and, more specifically, on the ability of our Company, our customers, suppliers, and lenders to finance their respective businesses and to access liquidity at acceptable financing costs, if at all, on the availability of supplies and materials, and on the demand for our products. For information on the impact of the United Kingdom's withdrawal from the European Union, see "Risk Factors — The United Kingdom's withdrawal from the European Union could adversely impact our results of operations."

Legal, Tax, Regulatory, and Other Risks

Unanticipated changes in our tax rates or additional income tax liabilities could impact our profitability.

We are subject to income taxes in the United States and various other jurisdictions, and our domestic and international tax liabilities are subject to allocation of expenses among different jurisdictions. Our effective tax rates and tax obligations could be adversely affected by changes in tax laws or rates (including the potential implementation of various U.S. tax proposals), changes in the mix of earnings by jurisdiction, changes in the valuation of deferred tax assets and liabilities, and material adjustments from tax audits.

In particular, the carrying value of deferred tax assets, which are predominantly in the U.S., is dependent upon our ability to generate future taxable income in the U.S. In addition, the amount of income taxes we pay is subject to ongoing audits in various jurisdictions, and a material assessment by a governing tax authority could affect our profitability.

Our tax expense and tax obligations could increase as a result of changing application of tax law.

Governments are facing greater pressure on public finances, which could lead to their more aggressively applying existing tax laws and regulations. Governments also periodically change tax laws and regulations.

The Organization for Economic Co-Operation and Development (OECD) has recently proposed changes to the current transfer pricing arm's length standard for allocating profit as well as a 15% minimum tax by jurisdiction. While the provision to alter the way profit is allocated by jurisdiction is not expected to impact the Company, the 15% minimum tax by jurisdiction may adversely impact the Company's global tax provision.

Any changes in corporate income tax rates or regulations, on repatriation of dividends, earnings, share repurchases, or capital, or on transfer pricing, as well as changes in the interpretation of existing tax laws and regulations in the jurisdictions in which we operate, could adversely affect our cash flow and increase our overall tax burden, which would negatively affect our profitability. Potential OECD changes impacting consumer businesses could also have an unfavorable effect on some of our key customer segments such as pharmaceutical and food and beverage, which could result in a decline or delay in capital spending by our customers and a resulting decline in our revenues and profitability.

We may be adversely affected by failure to comply with regulations of governmental agencies or by the adoption of new regulations. United States trade policy, including the imposition of tariffs and the resulting consequences, as well as other political policies in the United States, China, the U.K., and certain European countries, may also impact global trade or create uncertainty impacting our business.

Our products are subject to regulation by governmental agencies. These regulations govern a wide variety of activities relating to our products, including design and development, product safety, labeling, manufacturing, promotion, sales, and distribution. We also operate a global business and are subject to various laws and regulations in the many markets where we do business, including those relating to competition, employment and labor practices, international trade, and corruption. If we fail to comply with these regulations, or if new regulations are adopted that substantially change existing practice or impose new burdens, we may have to recall products and cease their manufacture and distribution. In addition, we could be subject to investigation costs, reputational harm, fines, criminal prosecution, and other damages that could impact our profitability.

Political policy in the United States, China, the U.K., and certain European countries may impact global trade and domestic purchasing or create uncertainty. In recent years, the United States government has adopted a new approach to trade policy and in certain cases has sought to renegotiate, or possibly terminate, certain existing trade agreements. The United States government has also initiated tariffs on certain foreign goods, particularly those produced in China. As a result, certain foreign governments, including the Chinese government, have imposed retaliatory tariffs on goods that their countries import from the United States. Certain governments also have implemented domestic purchasing requirements that could favor local competition and result in reduced sales.

These various trade policy and regulatory actions described above may restrict our access to lower-cost countries in certain circumstances or otherwise create uncertainty, negatively impact global markets, and make it more difficult or costly for us to import our products into certain countries. The adoption and expansion of trade restrictions or other governmental action related to tariffs or trade agreements or policies could also lead to an economic downturn and/or could create unfavorable fluctuations in currency exchange rates (see above description "Currency fluctuations affect our operating profits."). In times of uncertainty, some customers delay investments or defer normal replacement cycles, which could have an adverse impact on our sales. The adoption and expansion of trade restrictions or other governmental action related to tariffs or trade agreements or policies have the potential to adversely impact our business and financial performance.

The United Kingdom's withdrawal from the European Union could adversely impact our results of operations.

On January 31, 2020, the U.K. formally left the E.U. (commonly referred to as Brexit). After a transition period, on December 24, 2020, the U.K. and E.U. agreed to a trade deal (the Trade and Cooperation Agreement), which was ratified by the U.K. on December 30, 2020. This Trade and Cooperation Agreement came into effect on May 1, 2021 after it was ratified by both the European Parliament and Council of the European Union. The Trade and Cooperation Agreement allows the U.K. and E.U. to continue trading without tariffs or quotas; however, the movement of goods between the U.K. and the remaining member states of the E.U. may be subject to additional inspections and documentation checks, leading to possible delays at ports of entry and departure.

In addition, there are still a number of areas of uncertainty in connection with the future of the U.K. and its relationship with the E.U. and the application and interpretation of the Trade and Cooperation Agreement, and Brexit-related matters may take several years to be clarified and resolved. At this time, we cannot predict the potential impact of Brexit on our business. However, Brexit could adversely affect our operating results and financial condition.

If we cannot protect our intellectual property rights, or if we infringe or misappropriate the proprietary rights of others, our operating results could be harmed.

Our success depends on our ability to obtain, maintain, and enforce patents on our technology, maintain our trademarks, and protect our trade secrets. Our patents may not provide complete protection or may expire, and competitors may develop similar products that are not covered by our patents. Our patents may also be challenged by third parties and invalidated or narrowed. We may experience a decline in sales and/or profitability if any of these things occur. Competitors sometimes seek to take advantage of our trademarks or brands in ways that may create customer confusion or weaken our brand. Improper use or disclosure of our trade secrets may still occur.

We may be sued for infringing on the intellectual property rights of others. The cost of any litigation could affect our profitability regardless of the outcome, and management attention could be diverted. If we are unsuccessful in such litigation, we may have to pay damages, stop the infringing activity, and/or obtain a license. If we fail to obtain a required license, we may be unable to sell some of our products, which could result in a decline in our revenues.

We may be adversely affected by environmental laws and regulations.

We are subject to various environmental laws and regulations and incur expenditures in complying with environmental laws and regulations. We have corporate programs in place to manage compliance and stakeholder expectations related to environmental matters, but increasing public interest in climate change topics may result in the enactment of additional governmental laws and regulations related to this subject area. We are currently involved in, or have potential liability with respect to, the remediation of past contamination in various facilities. In addition, some of our facilities are or have been in operation for many decades and may have used substances or generated and disposed of wastes that are hazardous or may be considered hazardous in the future. These sites and disposal sites owned by others to which we sent waste may in the future be identified as contaminated and require remediation. Accordingly, it is possible that we could become subject to additional environmental liabilities in the future that may harm our results of operations or financial condition.

We may be adversely affected by regulations and market expectations related to sourcing and our supply chain, including conflict minerals.

The SEC has adopted disclosures and reporting requirements for companies whose products contain certain minerals and their derivatives, namely tin, tantalum, tungsten, or gold, known as conflict minerals. Companies must report annually whether or not such minerals originate from the Democratic Republic of Congo (DRC) and adjoining countries. These requirements could adversely affect the sourcing, availability, and pricing of materials used in the manufacturing of our products. In addition, we have incurred additional costs to comply with the disclosure requirements, including cost related to determining the source of any of the relevant minerals used in our products. Since our supply chain is complex, due diligence procedures we have implemented to understand the origins of the minerals we use in our operations may not enable us to ascertain with sufficient certainty the origins for these minerals or determine that these minerals are DRC conflict free, which may harm our reputation. We may also face difficulties in satisfying customers and other stakeholders who may require that our products be certified as DRC conflict free, which could harm our relationships with these customers and/or lead to a loss of revenue. These requirements also could have the effect of limiting the pool of suppliers from which we source these minerals, and we may be unable to obtain conflict-free minerals at prices similar to the past, which could increase our costs and adversely affect our manufacturing operations and our profitability.

Future laws, regulations, or customers may make additional demands on supply chain transparency. These demands can include more transparency into the activities of our suppliers with regard to human rights and sustainable sourcing. We have significant protections in place to ensure we partner with responsible suppliers, but increased demands may cause us to incur increased supply chain costs. If we cannot satisfy customers’ demands, we may lose business, and if we cannot meet new regulatory requirements, we may have to alter our sourcing at increased expense.

Our ability to generate and repatriate cash depends in part on factors beyond our control.

Our ability to make payments on our debt and to fund our share repurchase program, planned capital expenditures, and research and development efforts depends on our ability to generate and repatriate cash in the future. This is subject to factors beyond our control, including general economic, financial, competitive, legislative, regulatory, governmental, and other factors described in this section.

We cannot ensure that our business will generate sufficient cash flows from operations or that future borrowings will be available to us under our credit facility in an amount sufficient to enable us to pay our debt or to fund our other liquidity needs. We may need to refinance all or a portion of our indebtedness on or before maturity. We cannot ensure that we will be able to refinance any of our debt, including our credit facility and the senior notes, on commercially reasonable terms or at all.

Our ability to fund our share repurchase program is also dependent on our ability to repatriate our international cash flows. Changes in governmental cash repatriation policies, restrictions, or tax laws could impair our ability to continue our share repurchase program.

Risks Related to Our Debt

We have debt and we may incur substantially more debt, which could affect our ability to meet our debt obligations and may otherwise restrict our activities.

We have debt and we may incur substantial additional debt in the future. As of December 31, 2022, we had total indebtedness of approximately $1.9 billion, net of cash of $96.0 million. Our debt instruments allow us to incur substantial additional indebtedness.

The existence and magnitude of our debt could have important consequences. For example, it could make it more difficult for us to satisfy our obligations under our debt instruments; require us to dedicate a substantial portion of our cash flow to payments on our indebtedness, which would reduce the amount of cash flow available to fund working capital, capital expenditures, product development, and other corporate requirements; increase our vulnerability to general adverse economic and industry conditions, including changes in raw material costs; limit our ability to respond to business opportunities; limit our ability to borrow additional funds, which may be necessary; and subject us to financial and other restrictive covenants, which, if we fail to comply with these covenants and our failure is not waived or cured, could result in an event of default under our debt instruments.

The agreements governing our debt impose restrictions on our business.

The note purchase agreements governing our notes and the agreements governing our credit facility contain covenants imposing various restrictions on our business. These restrictions may affect our ability to operate our business and may limit our ability to take advantage of potential business opportunities. The restrictions these covenants place on us include limitations on our ability to incur liens and consolidate, merge, sell, or lease all or substantially all of our assets. Our credit facility and the note purchase agreements governing our senior notes also require us to meet certain financial ratios.

Our ability to comply with these agreements may be affected by events beyond our control, including economic, financial, and industry conditions. The breach of any covenants or restrictions could result in a default under the note purchase agreements governing the senior notes and/or under our credit facility. An event of default under the agreements governing our debt would permit holders of our debt to declare all amounts owed to them under such agreements to be immediately due and payable. Acceleration of our other indebtedness may cause us to be unable to make interest payments on the senior notes and repay the principal amount of the senior notes.

The lenders under our credit agreement may be unable to meet their funding commitments, reducing the amount of our borrowing capacity.

We have a revolving credit facility outstanding under which the Company and certain of its subsidiaries may borrow up to $1.25 billion. Our credit facility is provided by a group of 14 financial institutions, which individually have between 4% and 11% of the total funding commitment. At December 31, 2022, we had borrowings of $703.0 million outstanding under our credit facility. Our ability to borrow further funds under our credit facility is subject to the various lenders' financial condition and ability to make funds available. Even though the financial institutions are contractually obligated to lend funds, if one or more of the lenders encounters financial difficulties or goes bankrupt, such lenders may be unable to meet their obligations. This could result in us being unable to borrow the full $1.25 billion amount available.

We are subject to risks associated with the discontinuation of LIBOR.

In 2017, the U.K. Financial Conduct Authority (the FCA) announced that it intended to phase out the London Interbank Offered Rate (LIBOR). The FCA ceased publication of U.S. dollar LIBOR after December 31, 2021 in the case of one-week and two-month U.S. dollar LIBOR, and will cease publication after June 30, 2023 in the case of the remaining U.S dollar LIBOR benchmarks. While regulators in various jurisdictions have been working to replace LIBOR, it is unclear when new agreed-upon benchmark rates will be established. As mentioned in Note 2 to the consolidated financial statements, our current cross currency swap and credit agreements include provisions addressing the future discontinuation of LIBOR. The replacement of LIBOR with an alternative rate or benchmark may adversely affect interest rates and could result in higher borrowing costs. In addition, when LIBOR ceases to exist, we may need to amend certain contracts, including our credit facility and cross currency swap arrangements, and we cannot predict what alternative rate or benchmark would be negotiated. This may also result in an increase in our interest expense.

General Risk Factors

We make forward-looking statements, and actual events or results may differ materially from these statements because assumptions we have made prove incorrect due to market conditions in our industries or other factors.

We provide forward-looking statements both in our filings with the SEC and orally in connection with our quarterly earnings calls, including guidance on anticipated sales growth and earnings per share. You should not rely on forward-looking statements to predict our actual results. Our actual results or performance may be materially different than reflected in forward-looking statements because of various risks and uncertainties.

Our forward-looking statements may not be accurate or complete, and we do not intend to update or revise them in light of actual results. New risks also periodically arise. Please consider the risks and factors that could cause our results to differ materially from what is described in our forward-looking statements. See in particular "Factors Affecting Our Future Operating Results" and "Management's Discussion and Analysis of Financial Condition and Results of Operations."

In providing guidance on our future earnings, we evaluate our budgets, strategic plans, and other factors relating to our business. We make assumptions about external factors, including the following:

- the outlook for our end-markets and the global economy;
- the impact of external factors on our competition;
- the financial position of our customers and their willingness to pay for our products and services;
- the estimated costs of purchasing materials;
- the estimated costs of transportation and logistics;
- developments in personnel costs;
- our estimated income tax expense; and
- rates for currency exchange, particularly between the Chinese renminbi and the U.S. dollar and between the Swiss franc and the euro.

Some of these assumptions may prove to be incorrect over time. For example, although no single end-customer accounts for more than 1% of our revenues, if a number of our customers experienced significant deteriorations in their financial positions concurrently, it could have an impact on our results of operations.

Some of our key internal assumptions include the following:

- our ability to implement our business strategy;
- our ability to implement price increases as forecasted;
- the effectiveness of our sales and marketing programs such as our Spinnaker, market penetration, and Field Turbo initiatives;
- the effectiveness of our programs to improve our service business, including growth, globalization, and productivity initiatives;
- our ability to develop and deliver innovative products and services;
- the continued growth of our sales in emerging markets; and
- the effectiveness of productivity and cost saving initiatives.

These internal assumptions may also prove to be incorrect over time. For example, with respect to our ability to realize our planned price increases without disturbing our customer base in core markets, in certain markets, such as emerging markets, price tends to be a more significant factor in customers' decisions to purchase our products and services. Furthermore, we can have no assurance that our cost reduction programs will generate adequate cost savings. Additionally, it may become necessary to take additional restructuring actions resulting in additional restructuring costs.

We believe our current assumptions are reasonable and prudent for planning purposes. However, should any of these assumptions prove to be incorrect, or should we incur lower-than-expected operating performance or cash flows, we may experience results different than our projections.

Item 1B. *Unresolved Staff Comments*

None.

Item 2. *Properties*

Our principal executive offices are located in Columbus, Ohio and Greifensee, Switzerland. The following table lists our principal facilities, indicating the location and whether the facility is owned or leased. The properties listed below serve primarily as manufacturing facilities or shared service centers and also typically have a certain amount of space for service, sales and marketing, and administrative activities. The facilities in Giessen, Germany, Viroflay, France, and Salford, United Kingdom are used primarily for sales and marketing. We believe our facilities are adequate for our current and reasonably anticipated future needs.

Location	Owned/Leased	Business Segment
Europe:		
Greifensee/Nänikon, Switzerland	Owned	Swiss Operations
Urdorf, Switzerland	Owned	Swiss Operations
Manchester, England	Leased	Western European Operations
Royston, United Kingdom	Owned	Western European Operations
Salford, United Kingdom	Leased	Western European Operations
Viroflay, France	Owned	Western European Operations
Albstadt, Germany	Owned	Western European Operations
Giessen, (Hesse) Germany	Owned	Western European Operations
Giesen, (Lower Saxony) Germany	Owned	Western European Operations
Warsaw, Poland	Leased	Other Operations
Americas:		
Columbus, Ohio	Leased	U.S. Operations
Worthington, Ohio (two facilities)	Owned	U.S. Operations
Oakland, California	Owned	U.S. Operations
Billerica, Massachusetts	Owned	U.S. Operations
Lutz, Florida	Owned	U.S. Operations
Tijuana, Mexico	Leased	U.S. Operations
Thorofare, New Jersey	Owned	U.S. Operations
Princeton, New Jersey	Leased	U.S. Operations
Other:		
Shanghai, China (two facilities)	Buildings Owned; Land Leased	Chinese Operations
Changzhou, China (two facilities)	Buildings Owned; Land Leased	Chinese Operations
ChengDu, China	Building Owned; Land Leased	Chinese Operations
Mumbai, India (four facilities)	Building, Land Owned (1); Leased (3)	Other Operations

Item 3. *Legal Proceedings*

We are not currently involved in any legal proceeding that we believe could have a material adverse effect upon our financial condition, results of operations, or cash flows. See the disclosure in Item 1 above under "Environmental Matters," as well as Note 17 to the consolidated financial statements.

Executive Officers of the Registrant

See Part III, Item 10 of this annual report for information about our executive officers.

PART II

Item 5. *Market for Registrant's Common Equity, Related Stockholder Matters, and Issuer Purchases of Equity Securities*

Market Information for Common Stock

Our common stock is traded on the New York Stock Exchange under the symbol "MTD."

Holders

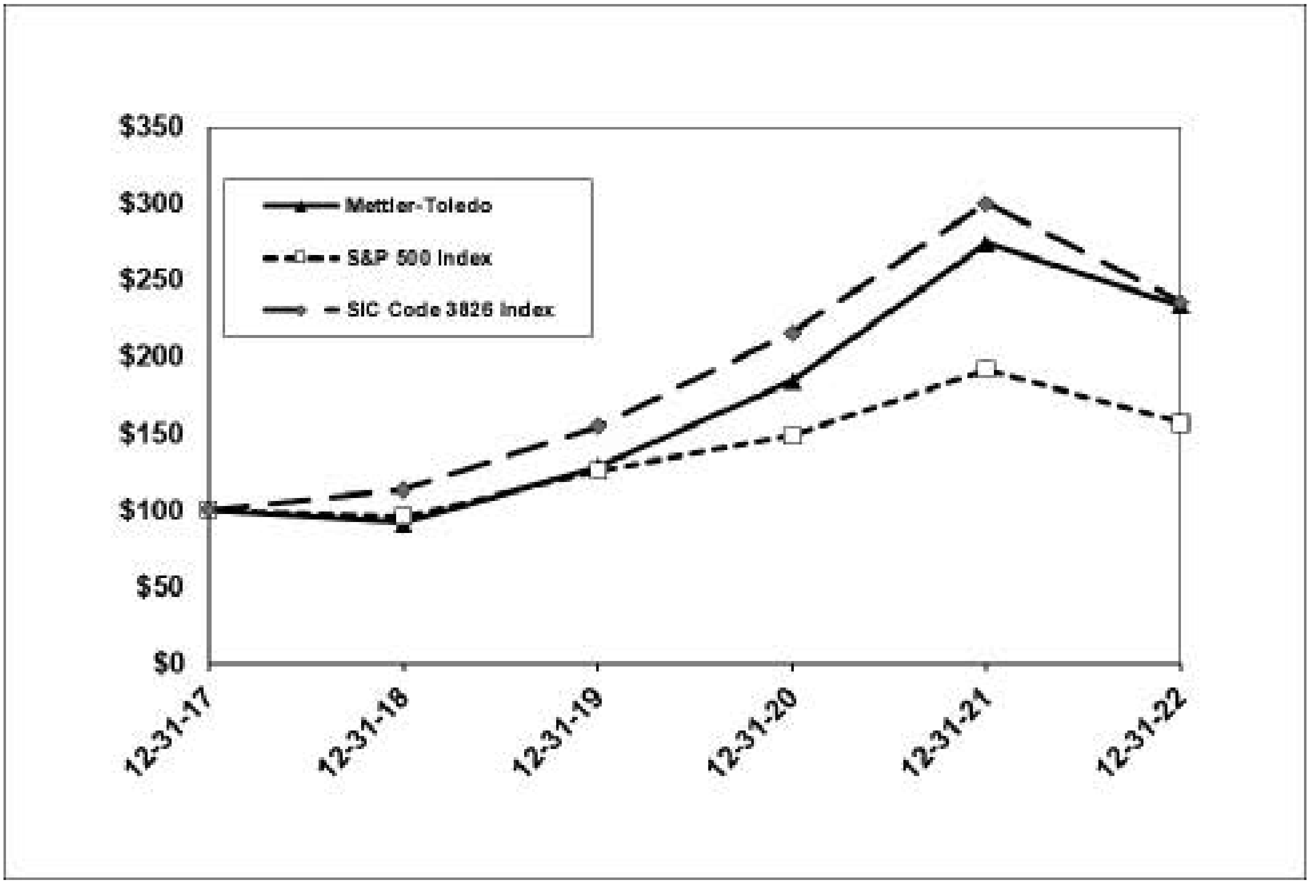
At January 26, 2023, there were 39 holders of record of common stock and 22,106,175 shares of common stock outstanding. We estimate we have approximately 219,878 beneficial owners of common stock.

Dividend Policy

Historically, we have not paid dividends on our common stock. However, we will evaluate this policy on a periodic basis taking into account our results of operations, financial condition, capital requirements including potential acquisitions, our share repurchase program, the taxation of dividends to our shareholders, and other factors deemed relevant by our Board of Directors.

Share Performance Graph

The following graph compares the cumulative total returns (assuming reinvestment of dividends) on $100 invested on December 31, 2017 through December 31, 2022 in our common stock, the Standard & Poor's 500 Composite Stock Index (S&P 500 Index), and the SIC Code 3826 Index — Laboratory Analytical Instruments.



Comparison of Cumulative Total Return Among Mettler-Toledo International Inc., the S&P 500 Index, and SIC Code 3826 Index — Laboratory Analytical Instruments[(a)]

	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22
Mettler-Toledo	$100	$91	$128	$184	$274	$233
S&P 500 Index	$100	$96	$126	$149	$192	$157
SIC Code 3826 Index	$100	$113	$155	$216	$300	$236

(a) The Performance Graph will not be deemed to be incorporated by reference into any filing under the Securities Act of 1933 or the Securities Exchange Act of 1934, except to the extent that the Company specifically incorporates it by reference. In addition, the Performance Graph will not be deemed to be "soliciting material" or to be "filed" with the SEC or subject to Regulation 14A or 14C, other than as provided in Regulation S-K, or to the liabilities of Section 18 of the Securities Exchange Act of 1934, except to the extent that the Company specifically requests that such information be treated as soliciting material or specifically incorporates it by reference into a filing under the Securities Act or the Securities Exchange Act.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

Issuer Purchases of Equity Securities

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Program	Approximate Dollar Value (in thousands) of Shares that may yet be Purchased under the Program
October 1 to October 31, 2022	75,550	$ 1,172.00	75,550	$ 1,144,884
November 1 to November 30, 2022	71,953	1,360.10	71,953	3,547,019
December 1 to December 31, 2022	61,127	1,449.24	61,127	3,458,430
Total	208,630	$ 1,318.10	208,630	$ 3,458,430

In November 2022, the Company's Board of Directors authorized an additional $2.5 billion to the share repurchase program, which had $3.5 billion of remaining availability as of December 31, 2022. The share repurchases are expected to be funded from cash generated from operating activities, borrowings, and cash balances. Repurchases will be made through open market transactions, and the amount and timing of purchases will depend on business and market conditions, the stock price, trading restrictions, the level of acquisition activity, and other factors.

We have purchased 31.0 million common shares since the inception of the program in 2004 through December 31, 2022, at a total cost of $8.0 billion. During the years ended December 31, 2022 and 2021, we spent $1.1 billion and $1.0 billion on the repurchase of 838,010 shares and 739,486 shares at an average price per share of $1,312.61 and $1,352.27, respectively. We reissued 133,916 shares and 110,748 shares held in treasury for the exercise of stock options and restricted stock units during 2022 and 2021, respectively.

Item 6. *Reserved*

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

The following discussion and analysis of our financial condition and results of operations should be read together with our consolidated financial statements.

Changes in local currencies exclude the effect of currency exchange rate fluctuations. Local currency amounts are determined by translating current and previous year consolidated financial information at an index utilizing historical currency exchange rates. We believe local currency information provides a helpful assessment of business performance and a useful measure of results between periods. We do not, nor do we suggest that investors should, consider such non-GAAP financial measures in isolation from, or as a substitute for, financial information prepared in accordance with GAAP. We present non-GAAP financial measures in reporting our financial results to provide investors with an additional analytical tool to evaluate our operating results.

We also include in the discussion below disclosures of immaterial qualitative factors that are not quantified. Although the impact of such factors is not considered material, we believe these disclosures can be useful in evaluating our operating results.

Overview

We operate a global business with sales that are diversified by geographic region, product range, and customer. We hold leading positions worldwide in many of our markets and attribute this leadership to several factors, including the strength of our brand name and reputation, our comprehensive offering of innovative instruments and solutions, our Spinnaker sales and marketing program, and the breadth and quality of our global sales and service network.

Net sales in U.S. dollars increased 5% in 2022 and 21% in 2021. Excluding the effect of currency exchange rate fluctuations, or in local currencies, net sales increased 11% in 2022 and 18% in 2021. In 2022, we experienced strong growth in most businesses with favorable market conditions and excellent execution. Growth in China and the Americas was particularly strong. We continue to benefit from our strong global leadership positions, diversified customer base, innovative product offering, investment in emerging markets, significant installed base, and the impact of our sophisticated global sales and marketing programs. Examples of these programs include identifying and investing in growth and market penetration opportunities, more effectively pricing our products and services, increasing our sales force effectiveness through improved guidance and redirecting resources to our most promising growth opportunities, increasing the use of digital tools, and continuing to optimize our lead generation and lead nurturing processes.

During 2022, we faced significant external challenges, such as global inflation, supply chain disruptions, the war in Ukraine, COVID-19 lockdowns in China, unfavorable foreign currency and increased interest rates. Our team's resilience and agility to quickly react to adapt to the changing environment were critical to our success. Our supply chain also was a competitive advantage, while our productivity and pricing programs helped offset significant inflationary pressures. Over the past few years, we also accelerated our ability to use advanced analytics to identify and pursue growth opportunities, while increasing the effectiveness of our digital tools to support our global sales organization. We also have continued to increase engagement with our customers with our Go-to-Market and digital approaches. Our Service business also delivered very strong results in 2022 as we have been able to support our customers' ability to maintain uptime, improve productivity and comply with regulatory requirements.

As we enter 2023, we expect to continue to benefit from market trends towards automation and digitalization, as well as customer investments in on/near-shoring activities. However, market conditions and challenges remain uncertain relating to the macro environment and global economy, including the impacts of tighter monetary policies and related increase in interest rates to combat inflation, ongoing developments related to Ukraine, and COVID-19 (particularly in China). We also will face difficult prior period comparisons in 2023 due to strong results in both 2022 and 2021. Furthermore, inflationary cost increases and challenges in the global supply chain may continue, and market conditions may change quickly.

Our laboratory sales experienced excellent growth in 2022, particularly from life sciences and biotech customers. We expect to continue to benefit from favorable biopharma market trends. We also believe we will continue to benefit from increased customer demand for automation, digitalization, and safety; new facility investments; and continued focus on regulatory compliance including data integrity requirements. Overall, we believe we are well positioned to continue to capture growth and gain market share in our laboratory business.

Our industrial sales experienced strong growth in 2022 in both core industrial and product inspection. Core industrial experienced particularly strong growth, especially in China and the U.S. We continue to benefit from our strong product offering and focus on the more attractive, faster-growing segments of the market and strong execution of our growth initiatives in each region. We also continue to benefit from market trends in automation and digitalization and also expect to benefit from customer on/near-shoring activities in the future. China and emerging market economies have historically been an important source of growth based upon the expansion of their domestic economies, and we expect this to be a source of future growth. Our core industrial-related products are also especially sensitive to changes in economic growth. We expect our product inspection end-market to also benefit from our customers' focus on brand protection, food safety, and productivity. However, product inspection customers in the packaged food industry have been negatively impacted by the war in Ukraine and the COVID-19 situation in China.

Our food retailing sales increased modestly during 2022 primarily due to improved project activity in the United States and Europe, while we experienced weaker market conditions in China. Traditionally, the spending levels in this sector have experienced more volatility than our other end-markets due to the timing of customer project activity and new regulations.

In 2023, we will continue to pursue the overall business growth strategies which we have followed in recent years:

Gaining Market Share. Innovation is essential to gaining market share and is fundamental in all aspects of our business including sales and marketing and technology leadership. Our global sales and marketing initiative, Spinnaker, continues to be an important growth strategy. We aim to gain market share by implementing sophisticated sales and marketing programs, leveraging our extensive customer databases, product offering and installed base. While this initiative is broad-based, efforts to improve these processes include the use of advanced data analytics to identify, prioritize, and pursue growth opportunities; the implementation of more effective pricing related to value-based selling strategies and processes; improved sales force guidance, training and effectiveness; cross-selling; increased segment marketing; and leads generation and nurturing activities. We also have added field sales and service resources to pursue underpenetrated market opportunities, and continue to adapt our Go-to-Market approaches with additional inside and telesales resources, while also increasing digital customer interaction. We continue to benefit from digitalization tools to gain efficiencies and increase the effectiveness of our field sales force. In addition, our comprehensive service offerings, and our initiatives to globalize and harmonize these offerings, help us further penetrate developed markets.

We estimate that we have the largest installed base of weighing instruments in the world, and we continue to leverage advanced data analytics and invest in sales and marketing activities to increase the proportion of our installed base that is under service contract, or sell new products that replace old products in our installed base. In addition to traditional repair and maintenance, our service offerings continue to expand into value-added services for a range of market needs, including regulatory compliance. We have also made adjustments to our service model to incorporate remote service, depot drop-off/pickup, and other approaches.

Faster Growing Markets. Emerging markets, comprising Asia (excluding Japan), Eastern Europe, Latin America, the Middle East, and Africa, account for approximately 37% of our total net sales. We have a two-pronged strategy in emerging markets: first, to capitalize on long-term growth opportunities in these markets, and second, to leverage our low-cost manufacturing operations in China. We have a 35-year track record in China, and our sales in Asia have grown more than 13% on a compound annual growth basis in local currencies since 1999. Over the years, we also have broadened our product offering to the Asian markets. India has also been a source of emerging market sales growth in past years due to increased life science research activities. Overall, versus the prior year, we experienced a 12% increase in emerging market local currency sales by destination during 2022, which included 14% local currency sales growth in China. Within China, we continue to redeploy resources and sales and marketing efforts to the faster-growing segments of pharma, food manufacturing, chemical, and new energy. We believe the long-term growth of these segments will be favorably impacted by the Chinese government's emphasis on science, high-value industries, product quality, and food safety. We expect our laboratory and product inspection businesses will particularly benefit from our focus on these segments. We also continue to invest and add sales and marketing resources to pursue growth in under-penetrated emerging markets. However, emerging market sales can be volatile. In particular, China has historically been volatile and market conditions may change unfavorably due to various factors. In addition to China and emerging markets, we also pursue other faster growth vertical markets. While rather small, these markets present outsized growth potential. Segments include lithium ion battery, semiconductors, advanced materials and plant-based food. The components of these faster growing segments will change as various markets develop and we will continue to leverage the breadth and scope of our product offering as new opportunities emerge.

Extending Our Technology Lead. We continue to focus on product innovation. In the last three years, we spent approximately 5% of net sales on research and development. We seek to improve our product offerings and their capabilities with additional integrated technologies and software, which we believe supports our pricing differentiation and accelerates product replacement cycles. In addition, we aim to create value for our customers by having thorough knowledge of their processes via our significant installed product base.

Expanding Our Margins. During 2022, we experienced increased inflation in our cost structure, particularly regarding costs for product materials and transportation and logistics. However, despite these challenges to our cost structure, we continue to strive to improve our margins by enhancing our value proposition via innovation, more effectively pricing our products and services, optimizing our cost structure, and improving our mix in higher-margin businesses such as service. For example, sophisticated data analytic tools provide us new insights to further refine our price strategies and processes. We also focus on reallocating resources and better aligning our cost structure to support our investments in market penetration initiatives, higher-growth/profitable areas, and opportunities for margin improvement.

We also have implemented global procurement and supply chain management programs over the last several years aimed at lowering costs, and have increased our focus on these programs with our SternDrive initiative. SternDrive is our global operational excellence program for continuous improvement efforts within our supply chain, manufacturing, and back-office operations. Blue Ocean is also an important enabler of our various margin expansion initiatives. Our move to standardized business processes, systems, and data structures throughout our global organization provides greater data transparency and faster access to real-time data. Our cost leadership and productivity initiatives are also focused on continuously improving our invested capital efficiency, such as reducing our working capital levels, improving our order to cash cycle, and ensuring appropriate returns on our expenditures.

Pursuing Strategic Acquisitions. We seek to pursue "bolt-on" acquisitions that may leverage our global sales and service network, respected brand, extensive distribution channels, and technological leadership. We have identified life sciences and process analytics as key areas for acquisitions. For example, in 2021, we acquired all the membership interests of Mayfair Technology, LLC (PendoTECH), a manufacturer and distributor of single-use sensors, transmitters, control systems, and software for measuring, monitoring, and data collection primarily in bioprocess applications. PendoTECH serves biopharmaceutical manufacturers and life science laboratories and is located in the United States. The initial cash payment was $185.0 million and we made other post-closing payments of $7.4 million. We have paid an additional $10.0 million related to an earn-out provision in the agreement during 2022 and expect to pay additional consideration of $10.0 million in 2023. In 2021, we also acquired Scale-up Systems Inc., a leading software provider for scale-up and reaction modeling serving the biopharma and chemical markets. The initial cash payment was $20.2 million and we may be required to pay additional consideration up to EUR 3.0 million.

COVID-19

The coronavirus pandemic (COVID-19) has spread globally in all countries where we conduct business. The COVID-19 pandemic continues to evolve and has led to the implementation of various responses, including government-imposed quarantines, stay-at-home orders and lockdowns, travel restrictions, vaccination and testing requirements, and other public health safety measures. The emergence of COVID-19 variants and subvariants has presented particular challenges to the global economy given the high level of transmissibility, which can cause many people to be affected at the same time or over a short period of time. For example, China recently eased its “zero COVID” policies related to previous lockdowns as part of the government's response to the COVID-19 pandemic. As a result China has experienced a significant increase in COVID-19 cases which may have negative implications on our business and supply chain, as well as the Chinese and global economies.

COVID-19 presents several risks to our business as further described on page 14 in the Risk Factors section of this Form 10-K. Uncertainties related to COVID-19 and the resulting impact to the global economy continue in most regions of the world, and market conditions can change quickly. The longer-term effects on our business will be influenced by the global economy and any economic implications in different regions of the world.

Ongoing Developments Related to Ukraine

We continue to monitor the ongoing developments related to Ukraine, as well as the status of all applicable sanctions. We have remained in close contact with our employees in Ukraine and have provided financial assistance and supplies to them. We suspended all shipments to Russia since the beginning of the invasion in February 2022. For historical reference, in 2021, approximately 1% of our net sales were in Russia and Ukraine, and we had an immaterial amount of assets and liabilities in both countries as of December 31, 2022 and 2021. We also do not have manufacturing in Russia or Ukraine.

The ongoing developments related to Ukraine present several risks to our business as further described on page 15 in the Risk Factors section of this Form 10-K. While it is difficult to estimate the impact of the ongoing invasion on the global economy, including increased inflation, higher energy and transportation costs and potential energy shortages, the invasion of Ukraine could adversely impact our financial results and presents several risks to our business.

Results of Operations — Consolidated

Net sales

Net sales were $3.9 billion for the year ended December 31, 2022, compared to $3.7 billion in 2021 and $3.1 billion in 2020. This represents an increase of 5% in 2022 and 21% in 2021 in U.S. dollars and an increase of 11% in 2022 and 18% in 2021 in local currencies. In 2022, we experienced strong growth in most businesses and regions with particularly strong growth in China and the Americas. We continue to benefit from the execution of our global sales and marketing programs, our innovative product portfolio, and investments in our field organization, particularly surrounding digital tools and techniques. However, there is uncertainty in the economic environment, including the risk of recession in some countries. Uncertainties and challenges also continue relating to ongoing developments related to Ukraine, COVID-19 (particularly in China), inflation, and supply chain challenges, and market conditions may change quickly.

In 2022, our net sales by geographic destination increased in U.S. dollars compared to 2021 by 11% in the Americas and 7% in Asia/Rest of World and decreased 5% in Europe. In local currencies, our net sales by geographic destination increased in 2022 by 12% in the Americas, 6% in Europe, and 13% in Asia/Rest of World, with 14% growth in China. Suspending shipments in Russia reduced our local currency sales in Europe by approximately 3% in 2022. The PendoTECH acquisition contributed approximately 1% to net sales in the Americas during 2022. A discussion of sales by operating segment is included below.

As described in Note 3 to our consolidated financial statements, our net sales comprise product sales of precision instruments and related services. Service revenues are primarily derived from repair and other services, including regulatory compliance qualification, calibration, certification, preventative maintenance, and spare parts.

Net sales of products increased 5% in U.S. dollars and 10% in local currencies during 2022 and increased 23% in U.S. dollars and 20% in local currencies in 2021. Service revenue (including spare parts) increased 6% in U.S. dollars and 12% in local currencies in 2022 and increased 11% in U.S. dollars and 8% in local currencies in 2021.

Net sales of our laboratory products and services, which represented approximately 57% of our total net sales in 2022, increased 7% in U.S. dollars and 12% in local currencies during 2022. The local currency increase in net sales of our laboratory-related products during 2022 includes very strong growth in most product categories. Net sales of our laboratory products also benefited approximately 1% from the PendoTECH acquisition.

Net sales of our industrial products and services, which represented approximately 38% of our total net sales in 2022, increased 4% in U.S. dollars and 9% in local currencies during 2022. The local currency increase in net sales of our industrial-related products during 2022 includes strong growth in most product categories, especially in core industrial.

Net sales of our food retailing products and services, which represented approximately 5% of our total net sales in 2022, decreased 5% in U.S. dollars and increased 1% in local currencies during 2022. The local currency increase includes improved project activity in the Americas, offset in part by weak market conditions in China.

Gross profit

Gross profit as a percentage of net sales was 58.9% for 2022 and 58.4% for both 2021 and 2020.

Gross profit as a percentage of net sales for products was 60.6% for 2022, compared to 60.1% for 2021 and 60.3% for 2020. Gross profit as a percentage of net sales for services (including spare parts) was 52.0% for 2022, compared to 51.8% for 2021 and 51.6% for 2020.

The gross profit as a percentage of net sales for 2022 primarily reflects increased sales volume and favorable price realization, offset by higher material costs.

Research and development and selling, general, and administrative expenses

Research and development expenses as a percentage of net sales were 4.5% for 2022, 4.6% for 2021, and 4.5% for 2020. Research and development expenses in U.S. dollars increased 4% in 2022 and 21% in 2021, and in local currencies increased 9% in 2022 and 17% in 2021. The increase during 2022 primarily relates to increased project activity.

Selling, general, and administrative expenses as a percentage of net sales were 23.9% for 2022, compared to 25.4% for 2021 and 26.6% for 2020. Selling, general, and administrative expenses decreased 1% in U.S. dollars and increased 4% in local currencies in 2022 and increased 15% in U.S. dollars and 12% in local currencies in 2021. The increase during 2022 primarily includes increased sales and marketing investments partially offset by lower cash incentive expense.

Amortization expense

Amortization expense was $66.2 million in 2022, compared to $63.1 million and $56.7 million in 2021 and 2020, respectively. The increase in amortization expense during 2022 is primarily related to purchased intangibles amortization.

Restructuring charges

During the past few years, we initiated various cost reduction measures. Restructuring charges were $9.6 million in 2022, compared to $5.2 million and $10.5 million in 2021 and 2020, respectively. Restructuring expenses are primarily comprised of employee-related costs.

Other charges (income), net

Other charges (income), net consisted of net income of $9.3 million, $3.1 million, and $13.8 million in 2022, 2021, and 2020, respectively. Other charges (income), net includes non-service pension costs (benefits), net (gains) losses from foreign currency transactions and hedging activities, interest income, and other items. Non-service pension benefits were $16.9 million, $11.4 million, and $12.2 million in 2022, 2021, and 2020, respectively. Other charges (income), net also includes $0.9 million and $3.4 million of acquisition costs for the years ended December 31, 2022 and 2021, respectively, as well as a $6.8 million charge to increase the PendoTECH acquisition contingent consideration and related obligations to the sellers for 2021.

Interest expense and taxes

Interest expense was $55.4 million for 2022, compared to $43.2 million for 2021 and $38.6 million for 2020.

Our reported tax rate was 18.5% during 2022, compared to 19.0% and 19.5% during 2021 and 2020, respectively.

Results of Operations — by Operating Segment

The following is a discussion of the financial results of our operating segments. We currently have five reportable segments: U.S. Operations, Swiss Operations, Western European Operations, Chinese Operations, and Other. A more detailed description of these segments is outlined in Note 18 to our consolidated financial statements.

U.S. Operations (amounts in thousands)

	2022	2021	2020	Increase (Decrease) in % 2022 vs. 2021	Increase (Decrease) in % 2021 vs. 2020
Net sales	$ 1,601,344	$ 1,443,970	$ 1,194,169	11%	21%
Net sales to external customers	$ 1,444,460	$ 1,287,983	$ 1,072,319	12%	20%
Segment profit	$ 357,802	$ 302,177	$ 244,940	18%	23%

Total net sales increased 11% in 2022 and 21% in 2021 and net sales to external customers increased 12% in 2022 and 20% in 2021. The increase during 2022 is driven by strong growth in most product categories. Net sales to external customers in our U.S. Operations also benefited approximately 1% from the PendoTECH acquisition.

Segment profit increased $55.6 million in our U.S. Operations segment during 2022, compared to an increase of $57.2 million during 2021. The segment profit increase in 2022 includes higher net sales volume and benefits from our margin expansion initiatives, offset in part by higher material costs.

Swiss Operations (amounts in thousands)

	2022	2021	2020	Increase (Decrease) in % (1) 2022 vs. 2021	Increase (Decrease) in % (1) 2021 vs. 2020
Net sales	$ 1,016,070	$ 997,634	$ 823,760	2%	21%
Net sales to external customers	$ 176,119	$ 171,633	$ 143,923	3%	19%
Segment profit	$ 309,844	$ 301,142	$ 245,465	3%	23%

(1) Represents U.S. dollar growth.

Total net sales in U.S. dollars increased 2% in 2022 and 21% in 2021, and in local currencies increased 6% in 2022 and increased 19% in 2021. Net sales to external customers in U.S. dollars increased 3% in 2022 and increased 19% in 2021, and in local currencies increased 6% in 2022 and increased 17% in 2021. Local currency net sales to external customers during 2022 includes strong growth in laboratory products.

Segment profit increased $8.7 million in our Swiss Operations segment during 2022, compared to an increase of $55.7 million during 2021. The segment profit increase in 2022 includes higher net sales volume and benefits from our margin expansion initiatives, offset in part by unfavorable foreign currency translation and higher material costs.

Western European Operations (amounts in thousands)

	2022	2021	2020	Increase (Decrease) in % (1) 2022 vs. 2021	Increase (Decrease) in % (1) 2021 vs. 2020
Net sales	$ 996,831	$ 1,041,308	$ 889,891	(4)%	17%
Net sales to external customers	$ 799,931	$ 829,761	$ 716,715	(4)%	16%
Segment profit	$ 174,352	$ 172,265	$ 147,562	1%	17%

(1) Represents U.S. dollar growth.

Total net sales in U.S. dollars decreased 4% in 2022 and increased 17% in 2021, and in local currencies increased 8% in 2022 and 12% in 2021. Net sales to external customers in U.S. dollars decreased 4% in 2022 and increased 16% in 2021, and in local currencies increased 9% in 2022 and 12% in 2021. Local currency net sales to external customers during 2022 includes solid growth in most product categories, especially laboratory and core-industrial products.

Segment profit increased $2.1 million in our Western European Operations segment during 2022, compared to an increase of $24.7 million in 2021. The segment profit increase in 2022 is primarily due to higher sales volume and benefits from our margin expansion initiatives, offset in part by unfavorable currency translation and higher material costs.

Chinese Operations (amounts in thousands)

	2022	2021	2020	Increase (Decrease) in % (1) 2022 vs. 2021	Increase (Decrease) in % (1) 2021 vs. 2020
Net sales	$ 1,149,690	$ 1,063,430	$ 792,345	8%	34%
Net sales to external customers	$ 841,526	$ 771,651	$ 578,610	9%	33%
Segment profit	$ 424,162	$ 369,835	$ 270,497	15%	37%

(1) Represents U.S. dollar growth.

Total net sales in U.S. dollars increased 8% in 2022 and increased 34% in 2021, and in local currencies increased 13% in 2022 and 26% in 2021. Net sales by origin to external customers in U.S. dollars increased 9% in 2022 and 33% in 2021, and in local currencies increased 13% in 2022 and

25% in 2021. The increase in net sales to external customers during 2022 includes very strong growth in laboratory and core-industrial products, offset in part by a decline in food retailing. However, uncertainties exist, especially relating to COVID-19 outbreaks and the related impact on the economy, and market conditions may change quickly.

Segment profit increased $54.3 million in our Chinese Operations segment during 2022, compared to an increase of $99.3 million in 2021. The increase in segment profit during 2022 primarily reflects increased sales volume and benefits from our margin expansion initiatives, offset in part by unfavorable currency translation and higher material costs.

Other (amounts in thousands)

	2022	2021	2020	Increase (Decrease) in % (1) 2022 vs. 2021	Increase (Decrease) in % (1) 2021 vs. 2020
Net sales	$ 661,632	$ 661,682	$ 578,210	—%	14%
Net sales to external customers	$ 657,673	$ 656,902	$ 573,610	—%	15%
Segment profit	$ 90,322	$ 100,028	$ 77,910	(10)%	28%

(1) Represents U.S. dollar growth.

Other includes reporting units in Southeast Asia, Latin America, Eastern Europe, and other countries. Net sales to external customers in U.S. dollars were flat in 2022 and increased 14% in 2021, and in local currencies increased 8% in 2022 and 12% in 2021. The increase in local currency growth in net sales to external customers during 2022 includes particularly strong growth in laboratory products.

Segment profit decreased $9.7 million in our Other segment during 2022, compared to an increase of $22.1 million during 2021. The decrease in segment profit during 2022 primarily relate to unfavorable foreign currency translation, offset by increased sales volume and benefits from our margin expansion initiatives.

Liquidity, Capital Resources, and Future Cash Requirements

Liquidity is our ability to generate sufficient cash to meet our obligations and commitments. Sources of liquidity include cash flows from operating activities, available borrowings under our Credit Agreement, the ability to obtain appropriate financing, and our cash and cash equivalent balances. Currently, our financing requirements are primarily driven by working capital requirements, capital expenditures, share repurchases, and acquisitions. Global market conditions can be uncertain, and our ability to generate cash flows could be reduced by a deterioration in global markets.

We currently believe that cash flows from operating activities, together with liquidity available under our Credit Agreement, local working capital facilities, and cash balances, will be sufficient to fund currently anticipated working capital needs and spending requirements for at least the foreseeable future.

Cash provided by operating activities totaled $859.1 million in 2022, compared to $908.8 million in 2021 and $724.7 million in 2020. The decrease in 2022 is primarily due to higher cash incentive payments related to our strong prior year performance and increased inventory levels to mitigate supply chain challenges.

Capital expenditures are made primarily for investments in information systems and technology, machinery, equipment, and the purchase and expansion of facilities. Our capital expenditures totaled $121.2 million in 2022, $107.6 million in 2021, and $92.5 million in 2020. Capital expenditures in 2023 are expected to be approximately $15 million higher than 2022 subject to business and economic conditions.

In September 2021, the Company entered into an agreement with the U.S. Department of Defense to increase domestic production capacity of pipette tips and enhance manufacturing automation and logistics. As of December 31, 2022, we have obtained $29.7 million of the $35.8 million of total funding to be received through 2023, which will offset associated capital expenditures. During the period ended December 31, 2022, we incurred approximately $28.1 million of capital expenditures relating to this funding agreement.

We continue to explore potential acquisitions. In connection with any acquisition, we may incur additional indebtedness. In March 2021, we acquired all the membership interests of Mayfair Technology, LLC (PendoTECH), a manufacturer and distributor of single-use sensors, transmitters, control systems, and software for measuring, monitoring, and data collection primarily in bioprocess applications. PendoTECH serves biopharmaceutical manufacturers and life science laboratories and is located in the United States. The initial cash payment was $185.0 million and we made other post-closing payments of $7.4 million. Additional consideration of $10.0 million was paid in 2022, and we expect to pay additional consideration of $10.0 million in 2023. In October 2021, the Company acquired Scale-up Systems Inc., a leading software provider for scale-up and reaction modeling serving the biopharma and chemical markets. The initial cash payment was $20.2 million and the Company may be required to pay additional amounts up to EUR 3.0 million. For additional information related to these acquisitions, refer to Note 4 to the consolidated financial statements.

In 2022, 2021, and 2020, we also incurred additional acquisition payments totaling $38.0 million, $8.3 million, and $6.2 million, respectively.

Cash flows used in financing activities during 2022 primarily comprised share repurchases. In accordance with our share repurchase program, we spent $1.1 billion in 2022 and $1.0 billion and $775.0 million in 2021 and 2020, respectively on the repurchase of 838,010 shares, 739,486 shares, and 815,652 shares, respectively. Our share repurchase program does not obligate us to acquire any specific number of shares; however, in 2023, we intend to spend a similar amount on the repurchase of shares as we spent in 2022, subject to business and economic conditions.

The Inflation Reduction Act (IRA) was enacted on August 16, 2022. The IRA includes provisions imposing a 1% excise tax on net share repurchases that occur after December 31, 2022 and introduces a 15% corporate alternative minimum tax (CAMT) on adjusted financial statement income. We expect the financial impact of the IRA to be immaterial to our financial statements.

We plan to continue to repatriate earnings from China, Switzerland, Germany, the United Kingdom, and certain other countries in future years and expect the only additional cost associated with the repatriation of such foreign earnings will be withholding taxes. All other undistributed earnings are considered to be permanently reinvested. We believe the ongoing tax impact associated with repatriating our undistributed foreign earnings will not have a material effect on our liquidity.

Senior Notes and Credit Facility Agreement

Our short-term borrowings and long-term debt consisted of the following at December 31, 2022:

	U.S. Dollar	Other Principal Trading Currencies	Total
4.10% $50 million 10-year Senior Notes due September 19, 2023	50,000	—	50,000
3.84% $125 million 10-year Senior Notes due September 19, 2024	125,000	—	125,000
4.24% $125 million 10-year Senior Notes due June 25, 2025	125,000	—	125,000
3.91% $75 million 10-year Senior Notes due June 25, 2029	75,000	—	75,000
2.83% $125 million 12-year Senior Notes due July 22, 2033	125,000	—	125,000
3.19% $50 million 15-year Senior Notes due January 24, 2035	50,000	—	50,000
2.81% $150 million 15-year Senior Notes due March 17, 2037	150,000	—	150,000
2.91% $150 million 15-year Senior Notes due September 1, 2037	150,000	—	150,000
1.47% EUR 125 million 15-year Senior Notes due June 17, 2030	—	133,794	133,794
1.30% EUR 135 million 15-year Senior Notes due November 6, 2034	—	144,497	144,497
1.06% EUR 125 million 15-year Senior Notes due March 19, 2036	—	133,794	133,794
Senior Notes debt issuance costs, net	(3,033)	(1,488)	(4,521)
Total Senior Notes	846,967	410,597	1,257,564
$1.25 billion Credit Agreement, interest at LIBOR plus 87.5 basis points(1)	507,679	189,532	697,211
Other local arrangements	3,891	55,868	59,759
Total debt	1,358,537	655,997	2,014,534
Less: current portion	(50,436)	(55,618)	(106,054)
Total long-term debt	$1,308,101	$ 600,379	$1,908,480

(1) See Note 6 and Note 7 to our consolidated financial statements for additional disclosures on the financial instruments associated with the Credit Agreement.

As of December 31, 2022, approximately $547.0 million of additional borrowings were available under our Credit Agreement and we maintained $96.0 million of cash and cash equivalents. At December 31, 2022, the interest payments associated with 73% of the Company's debt are fixed obligations. We expect to make interest payments of approximately $75.0 million during 2023 associated with our debt outstanding as of December 31, 2022.

Changes in exchange rates between the currencies in which we generate cash flow and the currencies in which our borrowings are denominated affect our liquidity. In addition, because we borrow in a variety of currencies, our debt balances fluctuate due to changes in exchange rates. Further, we do not have any downgrade triggers from rating agencies that would accelerate the maturity dates of our debt. We were in compliance with our debt covenants as of December 31, 2022.

Senior Notes

The Senior Notes listed above are senior unsecured obligations and interest is payable semi-annually. The Senior Notes each contain customary affirmative and negative covenants as further described in Note 10 to our consolidated financial statements.

In December 2022, we entered into an agreement to issue and sell $150 million 10-year Senior Notes in a private placement. We will issue $150 million with a fixed interest rate of 5.45% in March 2023, which will mature in March 2033. We will use the proceeds from the sale of the notes to refinance existing indebtedness and for other general corporate purposes.

In December 2021, we entered into an agreement to issue and sell $300 million 15-year Senior Notes in a private placement. We issued $150 million with a fixed interest rate of 2.81% (2.81% Senior Notes) in March 2022, which will mature in March 2037, and we issued $150 million with a fixed interest rate of

2.91% (2.91% Senior Notes) in September 2022, which will mature in September 2037. We used the proceeds from the sale of the notes to refinance existing indebtedness and for other general corporate purposes.

Credit Agreement

On June 25, 2021, we entered into a $1.25 billion Credit Agreement (the Credit Agreement), which amended our $1.1 billion Amended and Restated Credit Agreement (the Prior Credit Agreement), which is further described in Note 10 to our consolidated financial statements.

Other Local Arrangements

In April 2018, two of our non-U.S. pension plans issued loans totaling $39.6 million (Swiss franc 38 million) to a wholly-owned subsidiary of the Company. The loans have the same terms and conditions, which include an interest rate of SARON plus 87.5 basis points. The loans were renewed for one year in April 2022.

Share Repurchase Program

In November 2022, the Company's Board of Directors authorized an additional $2.5 billion to the share repurchase program which has $3.5 billion of remaining availability as of December 31, 2022. The share repurchases are expected to be funded from cash generated from operating activities, borrowings, and cash balances. Repurchases will be made through open market transactions, and the amount and timing of purchases will depend on business and market conditions, the stock price, trading restrictions, the level of acquisition activity, and other factors.

We have purchased 31.0 million common shares since the inception of the program in 2004 through December 31, 2022, at a total cost of $8.0 billion. During the years ended December 31, 2022 and 2021, we spent $1.1 billion and $1.0 billion on the repurchase of 838,010 shares and 739,486 shares at an average price per share of $1,312.61 and $1,352.27, respectively. We reissued 133,916 shares and 110,748 shares held in treasury for the exercise of stock options and restricted stock units during 2022 and 2021, respectively.

Effect of Currency on Results of Operations

Our earnings are affected by changing exchange rates. We are particularly sensitive to changes in the exchange rates between the Swiss franc, euro, Chinese renminbi, and U.S. dollar. We have more Swiss franc expenses than we do Swiss franc sales because we develop and manufacture products in Switzerland that we sell globally and have a number of corporate functions located in Switzerland. When the Swiss franc strengthens against our other trading currencies, particularly the U.S. dollar and euro, our earnings go down. We also have significantly more sales in the euro than we do expenses. When the euro weakens against the U.S. dollar and Swiss franc, our earnings also go down. We estimate a 1% strengthening of the Swiss franc against the euro would reduce our earnings before tax by approximately $1.8 million to $2.0 million annually.

We also conduct business throughout the world, including Asia Pacific, the United Kingdom, Eastern Europe, Latin America, and Canada. Fluctuations in these currency exchange rates against the U.S. dollar can also affect our operating results. The most significant of these currency exposures is the Chinese renminbi. The impact on our earnings before tax of the Chinese renminbi weakening 1% against the U.S. dollar is a reduction of approximately $3.7 million to $4.2 million annually.

In addition to the effects of exchange rate movements on operating profits, our debt levels can fluctuate due to changes in exchange rates, particularly between the U.S. dollar, the Swiss franc, and euro.

Based on our outstanding debt at December 31, 2022, we estimate that a 5% weakening of the U.S. dollar against the currencies in which our debt is denominated would result in an increase of $35 million in the reported U.S. dollar value of our debt.

Taxes

We are subject to taxation in many jurisdictions throughout the world. Our effective tax rate and tax liability will be affected by a number of factors, such as changes in law, the amount of taxable income in particular jurisdictions, the tax rates in such jurisdictions, tax treaties between jurisdictions, the extent to which we transfer funds between jurisdictions, and earnings repatriations between jurisdictions. Generally, the tax liability for each taxpayer within the Mettler-Toledo International Inc. group of companies is determined either (i) on a non-consolidated/non-combined basis or (ii) on a consolidated/combined basis only with other eligible entities subject to tax in the same jurisdiction, in either case without regard to the taxable losses of non-consolidated/non-combined affiliated legal entities.

Environmental Matters

We are subject to environmental laws and regulations in the jurisdictions in which we operate. We own or lease a number of properties and manufacturing facilities around the world. Like many of our competitors, we have incurred, and will continue to incur, capital and operating expenditures and other costs in complying with such laws and regulations.

We are currently involved in, or have potential liability with respect to, the remediation of past contamination in certain of our facilities. A former subsidiary of Mettler-Toledo, LLC known as Hi-Speed Checkweigher Co., Inc. was one of two private parties ordered by the New Jersey Department of Environmental Protection, in an administrative consent order signed on June 13, 1988, to investigate and remediate certain ground water contamination at a property in Landing, New Jersey. After the other party under this order failed to fulfill its obligations, Hi-Speed became solely responsible for compliance with the order. Residual ground water contamination at this site is now within a Classification Exception Area which the Department of Environmental Protection has approved and within which the Company oversees monitoring of the decay of contaminants of concern. A concurrent Well Restriction Area also exists for the site. The Department of Environmental Protection does not view these vehicles as remedial measures, but rather as "institutional controls" that must be adequately maintained and periodically evaluated. We estimate that the costs of compliance associated with the site over the next several years will approximate a total of $0.4 million.

In addition, certain of our present and former facilities have or had been in operation for many decades and, over such time, some of these facilities may have used substances or generated and disposed of wastes which are or may be considered hazardous. It is possible that these sites, as well as disposal sites owned by third parties to which we have sent wastes, may in the future be identified and become the subject of remediation. Although we believe that we are in substantial compliance with applicable environmental requirements and, to date, we have not incurred material expenditures in connection with environmental matters, it is possible that we could become subject to additional environmental liabilities in the future that could have a material adverse effect on our financial condition, results of operations, or cash flows.

Inflation

Global inflation significantly increased in 2022 and 2021 related to the COVID-19 economic recovery and associated disruptions in global demand, supply chains/logistics, and labor markets, as well as the war in Ukraine and related significant increase in energy costs. Inflation can affect the costs of goods and services that we use, including raw materials to manufacture our products, as well as transportation and logistical costs and other external costs and services. Inflation can also affect labor costs which are a significant element of our overall cost structure. Inflation can also lead to increased interest rates as country monetary policies combat inflation. This can result in reduced economic growth and recessionary conditions, as well as higher borrowing costs. Inflation presents several risks to our business as further described on page 21 in the Risk Factors section of this Form 10-K, and these inflationary conditions could have a greater impact on our operating results in future years.

Quantitative and Qualitative Disclosures about Market Risk

We have only limited involvement with derivative financial instruments and do not use them for trading purposes.

We have entered into certain cross currency swap agreements. The fair value of these contracts was a net asset of $4.1 million at December 31, 2022. Based on our agreements outstanding at December 31, 2022, a 100-basis-point change in interest rates and foreign currency exchange rates would result in a change in the net aggregate market value of these instruments by approximately $4.5 million. Any change in fair value would not affect our consolidated statement of operations unless such agreements and the debt they hedge were prematurely settled.

Critical Accounting Estimates

Management's discussion and analysis of our financial condition and results of operations is based upon our consolidated financial statements, which have been prepared in accordance with U.S. GAAP. The preparation of these consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues, expenses, and related disclosure of contingent assets and liabilities. On an ongoing basis, we evaluate our estimates, including those related to revenue, income taxes, inventories, goodwill and intangibles, leases, and pensions and other post-retirement benefits. We base our estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances. The results 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.

We believe the following critical accounting estimates affect our more significant judgments used in the preparation of our consolidated financial statements. For a detailed discussion on the application of these and other accounting policies, see Note 2 to our consolidated financial statements.

Income taxes

Income tax expense, deferred tax assets and liabilities, and reserves for unrecognized tax benefits reflect management's assessment of estimated future taxes to be paid on items in the consolidated financial statements. We record a valuation allowance to reduce our deferred tax assets to the amount that is more likely than not to be realized. The valuation allowance of $62.6 million as of December 31, 2022 is based on management's estimates of future taxable income and application of relevant income tax law. In the event we were to determine that we would be able to realize our deferred tax assets in the future in excess of the net recorded amount, an adjustment to the valuation allowance would increase income or equity in the period such determination was made. Likewise, should we determine that we would not be able to realize all or part of the valuation allowance in the future, an adjustment to the net deferred tax asset would be charged to income in the period such determination was made.

We plan to repatriate earnings from China, Switzerland, Germany, the United Kingdom, and certain other countries in future years and expect the additional tax costs associated with the repatriation of such earnings will be non-U.S. withholding taxes, certain state taxes, and U.S. taxes on currency gains, if any. All other undistributed earnings are considered permanently reinvested.

The significant assumptions and estimates described in the preceding paragraphs are important contributors to our ultimate effective tax rate for each year in addition to our income mix from geographical regions. If any of our assumptions or estimates were to change, or should our income mix from our geographical regions change, our effective tax rate could be materially affected. Based on earnings before taxes of $1.1 billion for the year ended December 31, 2022, each increase of $10.7 million in tax expense would increase our effective tax rate by 1%.

Employee benefit plans

The net periodic pension cost for 2022 and projected benefit obligation as of December 31, 2022 were $0.5 million and $110.3 million, respectively, for our U.S. pension plan. The net periodic cost for 2022 and projected benefit obligation as of December 31, 2022 were $3.3 million and $785.3 million, respectively, for our international pension plans. The net periodic post-retirement benefit for 2022 and expected post-retirement benefit obligation as of December 31, 2022 for our U.S. post-retirement medical benefit plan were $0.1 million and $0.7 million, respectively.

Pension and post-retirement benefit plan expense and obligations are developed from assumptions utilized in actuarial valuations. The most significant of these assumptions include the discount rate and expected return on plan assets. In accordance with U.S. GAAP, actual results that differ from the assumptions are accumulated and deferred over future periods. While management believes the assumptions used are appropriate, differences in actual experience or changes in assumptions may affect our plan obligations and future expense.

The expected rates of return on the various defined benefit pension plans' assets are based on the asset allocation of each plan and the long-term projected return of those assets, which represent a diversified mix of U.S. and international corporate equities and government and corporate debt securities. In 2002, we froze our U.S. defined benefit pension plan and discontinued our retiree medical program for certain current and all future employees. Consequently, no significant future service costs will be incurred on these plans. For 2022, the weighted average return on assets assumption was 6.75% for the U.S. plan and 3.84% for the international plans. A change in the rate of return of 1% would impact annual benefit plan expense by approximately $7.8 million after tax.

The discount rates for defined benefit and post-retirement plans are set by benchmarking against high-quality corporate bonds. For 2022, the weighted average discount rate assumption was 4.9% for the U.S. plan and 2.6% for the international plans, representing a weighted average of local rates in countries where such plans exist. A change in the discount rate of 1% would impact annual benefit plan expense by approximately $10.8 million after tax.

Goodwill and other intangible assets

As of December 31, 2022, our consolidated balance sheet included goodwill of $660.2 million and other intangible assets of $306.1 million.

Our business acquisitions typically result in goodwill and other intangible assets, which affect the amount of future period amortization expense and possible impairment expense. The determination of the value of such intangible assets requires management to make estimates and assumptions that affect our consolidated financial statements.

In accordance with U.S. GAAP, our goodwill and indefinite-lived intangible assets are not amortized, but are evaluated for impairment annually in the fourth quarter, or more frequently if events or changes in circumstances indicate that an asset might be impaired. The annual evaluations of goodwill and indefinite-lived intangible assets are generally based on an assessment of qualitative factors to determine whether it is more likely than not that the fair value of the asset is less than its carrying amount.

If we are unable to conclude whether the goodwill or indefinite-lived intangible asset is not impaired after considering the totality of events and circumstances during our qualitative assessment, we perform a quantitative impairment test by estimating the fair value of the respective reporting unit or indefinite-lived intangible asset and comparing the fair value to the carrying amount of the goodwill asset. If the carrying amount of the reporting unit or indefinite-lived intangible asset exceeds its fair value, an impairment charge equal to the difference is recognized.

Both the qualitative and quantitative evaluations consider operating results, business plans, economic conditions, and market data, among other factors. There are inherent uncertainties related to these factors and our judgment in applying them to the impairment analyses. Our assessments to date have indicated that there has been no impairment of these assets.

Should any of these estimates or assumptions change, or should we incur lower than expected operating performance or cash flows, including from a prolonged economic slowdown, we may experience a triggering event that requires a new fair value assessment for our reporting units, possibly prior to the required annual assessment. These types of events and resulting analysis could result in impairment charges for goodwill and other indefinite-lived intangible assets if the fair value estimate declines below the carrying value.

Our amortization expense related to intangible assets with finite lives may materially change should our estimates of their useful lives change.

New Accounting Pronouncements

See Note 2 to the consolidated financial statements.

Item 7A. *Quantitative and Qualitative Disclosures about Market Risk*

Discussion of this item is included in Management’s Discussion and Analysis of Financial Condition and Results of Operations.

Item 8. *Financial Statements and Supplementary Data*

The financial statements required by this item are set forth starting on page F-1 and the related financial schedule is set forth on page S-1.

Item 9. *Changes in and Disagreements with Accountants on Accounting and Financial Disclosure*

None.

Item 9A. *Controls and Procedures*

Conclusions Regarding the Effectiveness of Disclosure Controls and Procedures

Under the supervision and with the participation of our management, including the Chief Executive Officer and the Chief Financial Officer, we have evaluated the effectiveness of our disclosure controls and procedures as required by Exchange Act Rule 13a-15(b) as of the end of the period covered by this report. Based upon that evaluation, the Chief Executive Officer and the Chief Financial Officer have concluded that these disclosure controls and procedures are effective.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of the Company's financial statements for external reporting purposes in accordance with accounting principles generally accepted in the United States of America.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

Management assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2022. In making this assessment, we used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control — Integrated Framework (2013). Based on our assessment, we concluded that, as of December 31, 2022, the Company's internal control over financial reporting is effective.

PricewaterhouseCoopers LLP, an independent registered public accounting firm that audited the financial statements included in this Report on Form 10-K, has issued their integrated audit report, which covers our internal control over financial reporting, which appears on page F-2.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting during the quarter ended December 31, 2022 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. *Other Information*

None.

Item 9C. *Disclosure Regarding Foreign Jurisdictions that Prevent Inspections*

None.

PART III

Item 10. *Directors, Executive Officers, and Corporate Governance*

The executive officers of the Company are set forth below. Officers are appointed by the Board of Directors and serve at the discretion of the Board.

Name	Age	Position
Patrick Kaltenbach	59	President and Chief Executive Officer
Peter Aggersbjerg	54	Head of Divisions
Marc de La Guéronnière	59	Head of European and North American Market Organizations
Gerhard Keller	55	Head of Process Analytics
Christian Magloth	57	Head of Human Resources
Shawn P. Vadala	54	Chief Financial Officer
Richard Wong	58	Head of Asia/Pacific Market Organizations

Patrick Kaltenbach joined the Company in January 2021 and assumed the role of Chief Executive Officer beginning April 1, 2021. Prior to joining the Company, he served as the President of the Life Sciences Segment at Becton Dickinson since 2018. He was President of Life Sciences and Applied Markets Group at Agilent from 2014 to 2018. Previously, he held wide-ranging and increasing leadership roles at Agilent and its predecessor company, Hewlett Packard, since joining in 1991.

Peter Aggersbjerg has been Head of Divisions since January 2020 and Head of Laboratory since January 2018. From February 2016 to December 2017, he served as the Head of our Laboratory Weighing strategic business unit. Prior to joining the Company, he served as the Global BU Head for Medela's Neonatal Care business and a member of its Group management. Prior to Medela, Mr. Aggersbjerg worked in various CEO roles in the health care, medical devices, and industrial sectors in Switzerland, Denmark, and the U.S. Mr. Aggersbjerg will depart the Company at the end of February 2023 at which time Stefan Heiniger will become the Head of Laboratory. Mr. Heiniger has been the Head of Laboratory Weighing since 2018.

Marc de La Guéronnière has been Head of European Market Organizations of the Company since January 2008 and Head of North American Market Organizations since April 2014. He was Head of Region South and General Manager of the Company's market organization in Spain from January 2006 to January 2008. He joined the Company in 2001 as the Industrial Business Area Manager for our market organization in France. Prior to joining the Company, Mr. de La Guéronnière held various management positions in Europe and the United States with ABB-Elsag Bailey and Danaher-Zellweger.

Gerhard Keller joined the Company in 1991 and has been Head of Process Analytics since July 2018 and Head of Pipettes since July 2013. He previously was Head of Region East Asia/Pacific and also served in various Sales and Marketing leadership functions in Europe and Asia Pacific. Prior to joining the Company, he worked in Quality Control at Sandoz, now Novartis, in Switzerland.

Christian Magloth joined the Company in October 2010 and has been Head of Human Resources since December 2010. Prior to joining the Company, he served as Head of Human Resources of Straumann, a leading global medical devices company listed on the Swiss stock exchange, from April 2006 to September 2010. He previously served as Head of Human Resources at Hero Group, an international consumer foods company, and in various management positions at Hilti, a leading global construction supply company.

Shawn P. Vadala joined the Company in 1997 and has been Chief Financial Officer since January 2014 and also responsible for the Company's Pricing program since 2008. Mr. Vadala previously held various senior financial positions at the Company's Columbus, Ohio and Greifensee, Switzerland offices and was also responsible for Business Intelligence from 2010 to 2018. Prior to joining the Company, he worked in the Boston and Zurich, Switzerland offices of PricewaterhouseCoopers.

Richard Wong has been Head of Asia/Pacific Market Organizations since 2009. Prior to joining the company in 2008, he held various regional management positions with Agilent Technologies from 1998 to 2008 including Life Sciences Field Operations for North Asia based in Beijing and later in Tokyo. He started his career with Hewlett Packard in 1991 and held positions of increasing responsibilities in Sales & Marketing and Finance.

Certifications

Our Chief Executive Officer and Chief Financial Officer provide certifications pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 in connection with our quarterly and annual financial statement filings with the Securities and Exchange Commission. The certifications relating to this annual report are attached as Exhibits 31.1 and 31.2.

The remaining information called for by this item is incorporated by reference from the discussion in the sections "Proposal One: Election of Directors," "Board of Directors — General Information," "Board of Directors — Operation," and "Additional Information — Section 16(a) Beneficial Ownership Reporting Compliance" in the 2023 Proxy Statement.

Item 11. *Executive Compensation*

The information appearing in the sections captioned "Board of Directors — General Information — Director Compensation," "Compensation Discussion and Analysis," "Compensation Committee Report," and "Additional Information — Compensation Committee Interlocks and Insider Participation" in the 2023 Proxy Statement is incorporated by reference herein.

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

The information appearing in the section "Share Ownership" in the 2023 Proxy Statement is incorporated by reference herein. Information appearing in "Securities Authorized for Issuance under Equity Compensation Plans as of December 31, 2022" is included within Note 12 to the financial statements.

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

Certain Relationships and Related Transactions — None.

Director Independence — The information in the section "Board of Directors — General Information — Independence of the Board" in the 2023 Proxy Statement is incorporated by reference herein.

Item 14. *Principal Accounting Fees and Services*

Information appearing in the section "Audit Committee Report" in the 2023 Proxy Statement is hereby incorporated by reference.

PART IV

Item 15. *Exhibits and Financial Statement Schedules*

(a) Exhibits, Financial Statements, and Schedules:

1. *Financial Statements.* See Index to consolidated financial statements included on page F-1.
2. *Report of Independent Registered Public Accounting Firm (PCAOB ID 238).* See page F-2.
3. *Financial Statement Schedule.* See Schedule II, which is included on page S-1.
4. *List of Exhibits.* See Exhibit Index included on page E-1.

Item 16. *Form 10-K Summary*

None.

EXHIBIT INDEX

Exhibit No.	Description
3.1	Amended and Restated Certificate of Incorporation of the Company[1]
3.2	Second Amended and Restated By-laws of the Company, effective as of November 3, 2022 [24]
4.3	Description of Capital Stock[2]
10.1	Credit Agreement among Mettler-Toledo International Inc., certain of its subsidiaries, JPMorgan Chase Bank, N.A., and certain other financial institutions, dated as of June 25, 2021[3]
10.3	Note Purchase Supplement dated as of July 29, 2013 by and among Mettler-Toledo International Inc., Aviva Life and Annuity Company, and Teachers Insurance and Annuity Association of America to a Note Purchase Agreement dated October 10, 2012 by and among Mettler-Toledo International Inc., Massachusetts Mutual Life Insurance Company, C.M. Life Insurance Company, MassMutual Asia Limited, The Lincoln National Life Insurance Company, Lincoln Life & Annuity Company of New York, and Aviva Life and Annuity Company Royal Neighbors of America[5]
10.4	Second Amendment to Note Purchase Agreement dated as of December 23, 2021 to the Note Purchase Agreement dated as of October 10, 2012, entered into by and among Mettler-Toledo International Inc, The Lincoln National Life Insurance Company, Lincoln Life & Annuity Company of New York, Massachusetts Mutual Life Insurance Company, Massmutual Asia Limited, C.M. Life Insurance Company, Yf Life Insurance International Limited, Athene Annuity and Life Assurance Company, Royal Neighbors of America and Teachers Insurance and Annuity Association of America[12]
10.5	Note Purchase Agreement dated as of June 27, 2014 by and among Mettler-Toledo International Inc., Babson Capital Management LLC, Cigna Investments, Inc., and Teachers Insurance and Annuity Association of America[6]
10.6	First Amendment to Note Purchase Agreement dated as of June 27, 2014 by and among Mettler-Toledo International Inc., Babson Capital Management LLC, Cigna Investments, Inc., and Teachers Insurance and Annuity Association of America[20]
10.7	Second Amendment to Note Purchase Agreement dated as of December 23, 2021 to the Note Purchase Agreement dated as of June 27, 2014, entered into by and among Mettler-Toledo International Inc., Life Insurance Company of North America, New York Life Group Insurance Company of NY, Erie Family Life Insurance Company, Metropolitan Life Insurance Company, Massachusetts Mutual Life Insurance Company, Yf Life Insurance International Limited, Banner Life Insurance Company, Great-West Life & Annuity Insurance Company, Teachers Insurance and Annuity Association of America, Connecticut General Life Insurance Company, and Healthspring Life & Health Insurance Company, Inc.[12]
10.8	Note Purchase Agreement dated as of March 31, 2015 by and among Mettler-Toledo International Inc., Metropolitan Life Insurance Company, MetLife Insurance Company USA, OMI MLIC Investments Limited, and Massachusetts Mutual Life Insurance Company[7]
10.9	First Amendment to Note Purchase Agreement dated as of March 31, 2015 by and among Mettler-Toledo International Inc., Metropolitan Life Insurance Company, MetLife Insurance Company USA, OMI MLIC Investments Limited, and Massachusetts Mutual Life Insurance Company[20]
10.10	Second Amendment to Note Purchase Agreement dated as of December 23, 2021, to the Note Purchase Agreement dated as of March 31, 2015, entered into by and among Mettler-Toledo International Inc., Metropolitan Life Insurance Company, Brighthouse Life Insurance Company, Massachusetts Mutual Life Insurance Company, and Great-West Life & Annuity Insurance Company of New York.[12]
10.11	Note Purchase Agreement dated as of April 18, 2019 by and among Mettler-Toledo International Inc., Connecticut General Life Insurance Company, Life Insurance Company of North America, Cigna Health and Life Insurance Company, MetLife Insurance K.K., Brighthouse Life Insurance Company, Brighthouse Reinsurance Company of Delaware, Transatlantic Reinsurance Company, and Pensionskasse des Bundes PUBLICA[8]
10.12	First Amendment to Note Purchase Agreement dated as of December 23, 2021 to the Note Purchase Agreement dated as of April 18, 2019, entered into by and among Mettler-Toledo International Inc., Metlife Insurance K.K., Brighthouse Life Insurance Company, Brighthouse Reinsurance Company of Delaware, Transatlantic Reinsurance Company, Pensionskasse Des Bundes Publica, Ensign Peak Advisors, Inc., Clifton Park Capital Management, LLC, Life Insurance Company of North America, and New York Life Group Insurance Company of NY[12]
10.13	Note Purchase Agreement dated as of November 6, 2019 by and among Mettler-Toledo International Inc., Metlife Insurance K.K., Metropolitan Tower Life Insurance Company, Pensionskasse des Bundes PUBLICA, The Northwestern Mutual Life Insurance Company, The Prudential Insurance Company of America, Athene Annuity and Life Company, Athene Annuity & Life Assurance Company, and The Lincoln National Life Insurance Company[9]
10.14	First Amendment to Note Purchase Agreement dated as of December 23, 2021 to the Note Purchase Agreement dated as of November 6, 2019, entered into by and among Mettler-Toledo International Inc., Metlife Insurance K.K., Metropolitan Tower Life Insurance Company, Pensionskasse Des Bundes Publica, The Northwestern Mutual Life Insurance Company, The Prudential Insurance Company of America, Athene Annuity and Life Company, Athene Annuity & Life Assurance Company, The Lincoln National Life Insurance Company, Swiss Re Life & Health America Inc., Zurich American Insurance Company Master Retirement Trust, The Northwestern Mutual Life Insurance Company, The Northwestern Mutual Life Insurance Company for its Group Annuity Separate Account, Physicians Mutual Insurance Company, Prudential Term Reinsurance Company, The Gibraltar Life Insurance Co., Ltd., American General Life Insurance Company, and The United States Life Insurance Company in the City of New York[12]
10.15	Note Purchase Agreement dated as of December 16, 2020 by and among Mettler-Toledo International Inc., Pruco Life Insurance Company, The Prudential Insurance Company of America, American General Life Insurance Company, The United States Life Insurance Company in the City of New York, The Variable Annuity Life Insurance Company, Athene Annuity and Life Company, Jackson National Life Insurance Company, The Lincoln National Life Insurance Company, Lincoln Life & Annuity Company of New York, MetLife Insurance K.K., Metropolitan Life Insurance Company, and The Northwestern Mutual Life Insurance Company[10]

Exhibit No.	Description
10.16	First Amendment to Note Purchase Agreement dated as of December 23, 2021 to the Note Purchase Agreement dated as of December 16, 2020, entered into by and among Mettler-Toledo International Inc., Pruco Life Insurance Company, The Prudential Insurance Company of America, American General Life Insurance Company, The United States Life Insurance Company in the City of New York, The Variable Annuity Life Insurance Company, Athene Annuity and Life Company, Jackson National Life Insurance Company, The Lincoln National Life Insurance Company, Lincoln Life & Annuity Company of New York, Metlife Insurance K.K., Metropolitan Life Insurance Company, and The Northwestern Mutual Life Insurance Company(12)
10.17	Note Purchase Agreement dated as of May 18, 2021 by and among Mettler-Toledo International Inc., Gibraltar Universal Life Reinsurance Company, Highmark Inc., Pruco Life Insurance Company, The Prudential Insurance Company of America, American General Life Insurance Company, The Variable Annuity Life Insurance Company, Athene Annuity & Life Assurance Company, American Equity Investment Life Insurance Company, Athene Annuity and Life Company, Venerable Insurance and Annuity Company, The Lincoln National Life Insurance Company, Lincoln Life & Annuity Company of New York, Zurich American Insurance Company, Metropolitan Life Insurance Company, Metlife Insurance K.K., The Northwestern Mutual Life Insurance Company, The Northwestern Mutual Life Insurance Company for its Group Annuity Separate Account, Connecticut General Life Insurance Company, and Cigna Health and Life Insurance Company(11)
10.18	First Amendment to Note Purchase Agreement dated as of December 23, 2021 to the Note Purchase Agreement dated as of May 18, 2021, entered into by and among Mettler-Toledo International Inc., Gibraltar Universal Life Reinsurance Company, Highmark Inc., Pruco Life Insurance Company, The Prudential Insurance Company of America, American General Life Insurance Company, The Variable Annuity Life Insurance Company, Athene Annuity & Life Assurance Company, American Equity Investment Life, Insurance Athene Annuity And Life Company, Venerable Insurance And Annuity Company, The Lincoln National Life Insurance Company, Lincoln Life & Annuity Company of New York, Zurich American Insurance Company, Metropolitan Life Insurance Company, Metlife Insurance K.K., The Northwestern Mutual Life Insurance Company, The Northwestern Mutual Life Insurance Company for its Group Annuity Separate Account, Connecticut General Life Insurance Company, and Cigna Health and Life Insurance Company(12)
10.19	Note Purchase Agreement dated as of December 23, 2021 by and among Mettler-Toledo International Inc., The Lincoln National Life Insurance Company, Metropolitan Life Insurance Company, MetLife Insurance K.K., Lockheed Martin Investment Management Company, Metropolitan Tower Life Insurance Company, The Northwestern Mutual Life Insurance Company, Gibraltar Universal Life Reinsurance Company, Prudential Legacy Insurance Company of New Jersey, Prudential Universal Reinsurance Company, The Prudential Insurance Company of America, PICA Hartford Life Insurance Comfort Trust, The Northwestern Mutual Life Insurance Company for its Group Annuity Separate Account, American General Life Insurance Company, The Variable Annuity Life Insurance Company, Massachusetts Mutual Life Insurance Company, Great-West Life & Annuity Insurance Company of New York, New York Life Insurance Company, New York Life Insurance and Annuity Company, New York Life Insurance and Annuity Corporation Institutionally Owned Life Insurance Separate Account, and Teachers Insurance and Annuity Association of America(12)
10.20	Note Purchase Agreement dated as of December 16, 2022 by and among Mettler-Toledo International Inc., Brighthouse Life Insurance Company, Missouri Reinsurance, Inc., Homesteaders Life Company, Employers Mutual Casualty Company, John Hancock Pension Plan, EMC National Life Company, The Northwestern Mutual Investment, The Northwestern Mutual Life Insurance Company for its Group Annuity Separate Account, Teachers Insurance and Annuity Association of America, Independent Life Insurance Company, Aaraugische Pensionskasse, BCBSM, Inc. DBA Blue Cross and Blue Shield of Minnesota, The Prudential Gibraltar Financial Life Insurance Co., LTD, The Prudential Insurance Company of America, New York Life Insurance Company, New York Life Insurancce and Annuity Corporation, New York Life Insurance and Annuity Corporation Institutionally Owned Life Insurance, The Bank of New York Mellon (22)
10.21†	Mettler-Toledo International Inc. 2007 Share Plan, effective February 7, 2008(13)
10.22†	Mettler-Toledo International Inc. 2013 Equity Incentive Plan, (Amended and Restated effective May 6, 2021)(14)
10.23†	Form of Restricted Stock Unit Agreement(4)
10.24†	Form of Performance Share Unit Agreement(23)
10.26†	Form of Stock Option Agreement Directors(4)
10.27†	Form of Stock Option Agreement CEO(4)
10.28†	Form of Stock Option Agreement NEOs(4)
10.29†	Non-Employee Director Share Award Agreement(2)
10.32†	Regulations of the POBS PLUS — Incentive System for Members of the Group Management of Mettler Toledo, effective as of November 2, 2022
10.50†	Employment Agreement between Peter Aggersbjerg and Mettler-Toledo International Inc., dated as of November 8, 2019(15)
10.51†	Employment Agreement between Marc de La Guéronnière and Mettler-Toledo International Inc., dated as of January 27, 2011(16)
10.52†	Employment Agreement between Olivier Filliol and Mettler-Toledo International Inc., dated as of November 1, 2007(17)
10.53†	Amended Employment Agreement between Olivier Filliol and Metter-Toledo International Inc., dated as of December 14, 2020(18)
10.54†	Employment Agreement between Patrick Kaltenbach and Mettler-Toledo International Inc., dated as of December 14, 2020(19)
10.55†	Employment Agreement between Christian Magloth and Mettler-Toledo International Inc., dated as of March 22, 2010(16)
10.56†	Employment Agreement between Gerhard Keller and Mettler-Toledo International Inc., dated as of April 27, 2018(19)
10.57†	Employment Agreement between Shawn P. Vadala and Mettler-Toledo International Inc., dated as of October 24, 2016(4)
10.58†	Form of Tax Equalization Agreement between Messrs. Filliol, Aggersbjerg, Keller, Magloth, Kaltenbach, and Mettler-Toledo International Inc., dated as of October 10, 2007(14)

Exhibit No.	Description
10.59†	Employment Agreement between Richard Wong and Mettler-Toledo International Inc. dated as of July 8, 2008
21*	Subsidiaries of the Company
23.1*	Consent of PricewaterhouseCoopers LLP
31.1*	Certification of the Chief Executive Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2*	Certification of the Chief Financial Officer Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32*	Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS	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	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
104	Cover Page Interactive Data File (embedded within the Inline XBRL Document)

(1) *Incorporated by reference to the Company's Report on Form 10-K dated March 13, 1998*

(2) *Incorporated by reference to the Company's Report on Form 10-K dated February 8, 2021*

(3) *Incorporated by reference to the Company's Report on Form 8-K dated June 30, 2021*

(4) *Incorporated by reference to the Company's Report on Form 10-K dated February 2, 2017*

(5) *Incorporated by reference to the Company's Report on Form 8-K dated July 29, 2013*

(6) *Incorporated by reference to the Company's Report on Form 8-K dated July 2, 2014*

(7) *Incorporated by reference to the Company's Report on Form 8-K dated March 31, 2015*

(8) *Incorporated by reference to the Company's Report on Form 8-K dated April 18, 2019*

(9) *Incorporated by reference to the Company's Report on Form 8-K dated November 6, 2019*

(10) *Incorporated by reference to the Company's Report on Form 8-K dated December 16, 2020*

(11) *Incorporated by reference to the Company's Report on Form 8-K dated May 20, 2021*

(12) *Incorporated by reference to the Company's Report on Form 8-K dated December 29, 2021*

(13) *Incorporated by reference to the Company's Report on Form 10-K dated February 15, 2008*

(14) *Incorporated by reference to the Company's Registration Statement on Form S-8 dated July 30, 2021 (Reg. No. 333-258294)*

(15) *Incorporated by reference to the Company's Report on Form 10-K dated February 7, 2020*

(16) *Incorporated by reference to the Company's Report on Form 10-K dated February 16, 2011*

(17) *Incorporated by reference to the Company's Report on Form 8-K dated November 1, 2007*

(18) *Incorporated by reference to the Company's Report on Form 8-K dated December 15, 2020*

(19) *Incorporated by reference to the Company's Report on Form 10-Q dated July 27, 2018*

(20) *Incorporated by reference to the Company's Report on Form 8-K dated April 24, 2015*

(21) *Incorporated by reference to the Company's Report on Form 8-K dated November 8, 2022*

(22) *Incorporated by reference to the Company's Report on Form 8-K dated December 23, 2022*

(23) *Incorporated by reference to the Company's Report on Form 10-K dated February 11, 2022*

* *Filed herewith*

† *Management contract or compensatory arrangement*

SIGNATURES

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

Mettler-Toledo International Inc.
(Registrant)

Date: February 10, 2023

By: /s/Patrick Kaltenbach
Patrick Kaltenbach
President and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, as amended, this Annual Report on Form 10-K has been signed below by the following persons on behalf of the registrant as of the date set out above and in the capacities indicated.

Signature	Title
/s/Patrick Kaltenbach Patrick Kaltenbach	President and Chief Executive Officer
/s/Shawn P. Vadala Shawn P. Vadala	Chief Financial Officer
/s/Wah-Hui Chu Wah-Hui Chu	Director
/s/Roland Diggelmann Roland Diggelmann	Director
/s/Domitille Doat-Le Bigot Domitille Doat-Le Bigot	Director
/s/Olivier A. Filliol Olivier A. Filliol	Director
/s/Elisha Finney Elisha Finney	Director
/s/Richard Francis Richard Francis	Director
/s/Michael A. Kelly Michael A. Kelly	Director
/s/Thomas P. Salice Thomas P. Salice	Director
/s/Robert F. Spoerry Robert F. Spoerry	Director
/s/Ingrid Zhang Ingrid Zhang	Director

METTLER-TOLEDO INTERNATIONAL INC.

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Mettler-Toledo International Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Mettler-Toledo International Inc. and its subsidiaries (the "Company") as of December 31, 2022 and 2021, and the related consolidated statements of operations, of comprehensive income, of shareholders' equity and of cash flows for each of the three years in the period ended December 31, 2022, including the related notes, and schedule of valuation and qualifying accounts for each of the three years in the period ended December 31, 2022 appearing on page S-1 (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2022, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2022 and 2021**,** and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2022, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed 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. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

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

Product Revenue Recognition

As described in Note 2 to the consolidated financial statements, product revenue is recognized from contracts with customers when a customer has obtained control of a product. The Company considers control to have transferred based upon shipping terms. As described in Note 3, for the year ended December 31, 2022, the Company's net sales were $3.9 billion, of which $3.1 billion relate to product revenue.

The principal consideration for our determination that performing procedures relating to product revenue recognition is a critical audit matter is a high degree of auditor effort in performing procedures related to product revenue recognition.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the product revenue recognition process. These procedures also included, among others, testing the appropriateness of product revenue recognized for a sample of product revenue transactions by obtaining and inspecting evidence of arrangement, evidence of products delivered, and, where applicable, consideration received in exchange for those products.

/s/ PricewaterhouseCoopers LLP

Columbus, Ohio
February 10, 2023

We have served as the Company's auditor since 2005.

METTLER-TOLEDO INTERNATIONAL INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
For the years ended December 31
(In thousands, except share data)

	2022	2021	2020
Net sales			
Products	$ 3,118,721	$ 2,960,615	$ 2,405,172
Service	800,988	757,315	680,005
Total net sales	3,919,709	3,717,930	3,085,177
Cost of sales			
Products	1,227,230	1,181,020	954,697
Service	384,437	365,357	329,449
Gross profit	2,308,042	2,171,553	1,801,031
Research and development	177,122	169,766	140,102
Selling, general, and administrative	938,461	943,976	820,221
Amortization	66,239	63,075	56,665
Interest expense	55,392	43,242	38,616
Restructuring charges	9,556	5,239	10,516
Other income, net	(9,320)	(3,106)	(13,832)
Earnings before taxes	1,070,592	949,361	748,743
Provision for taxes	198,090	180,376	146,004
Net earnings	$ 872,502	$ 768,985	$ 602,739
Basic earnings per common share:			
Net earnings	$ 38.79	$ 33.25	$ 25.24
Weighted average number of common shares	22,491,790	23,129,862	23,882,648
Diluted earnings per common share:			
Net earnings	$ 38.41	$ 32.78	$ 24.91
Weighted average number of common and common equivalent shares	22,718,290	23,457,630	24,199,230

The accompanying notes are an integral part of these consolidated financial statements.

METTLER-TOLEDO INTERNATIONAL INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
For the years ended December 31
(In thousands, except share data)

	2022	2021	2020
Net earnings	$ 872,502	$ 768,985	$ 602,739
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustment	(63,298)	11,535	29,914
Unrealized gains (losses) on cash flow hedging arrangements:			
Unrealized gains (losses)	10,029	4,394	(11,323)
Effective portion of (gains) losses included in net earnings	(5,775)	(2,913)	11,066
Defined benefit pension and post-retirement plans:			
Net actuarial gains (losses)	70,672	19,293	(35,662)
Plan amendments and prior service cost	(9)	18,831	(93)
Amortization of actuarial losses (gains), plan amendments, and prior service cost	13,278	19,326	14,547
Impact of foreign currency	3,094	9,235	(19,701)
Total other comprehensive income (loss), net of tax	27,991	79,701	(11,252)
Comprehensive income	$ 900,493	$ 848,686	$ 591,487

The accompanying notes are an integral part of these consolidated financial statements.

METTLER-TOLEDO INTERNATIONAL INC.
CONSOLIDATED BALANCE SHEETS
As of December 31
(In thousands, except share data)

	2022	2021
ASSETS		
Current assets:		
Cash and cash equivalents	$ 95,966	$ 98,564
Trade accounts receivable, less allowances of $22,427 in 2022 and $22,176 in 2021	709,321	647,335
Inventories	441,694	414,543
Other current assets and prepaid expenses	128,108	108,916
Total current assets	1,375,089	1,269,358
Property, plant, and equipment, net	778,600	799,365
Goodwill	660,170	648,622
Other intangible assets, net	306,054	307,450
Deferred tax assets, net	27,080	39,496
Other non-current assets	345,402	262,507
Total assets	$ 3,492,395	$ 3,326,798
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Trade accounts payable	$ 252,538	$ 272,911
Accrued and other liabilities	205,253	208,811
Accrued compensation and related items	200,031	236,265
Deferred revenue and customer prepayments	192,759	192,648
Taxes payable	191,096	134,769
Short-term borrowings and current maturities of long-term debt	106,054	101,134
Total current liabilities	1,147,731	1,146,538
Long-term debt	1,908,480	1,580,808
Deferred tax liabilities, net	111,360	62,230
Other non-current liabilities	300,031	365,801
Total liabilities	3,467,602	3,155,377
Commitments and contingencies (Note 17)		
Shareholders' equity:		
Preferred stock, $0.01 par value per share; authorized 10,000,000 shares	—	—
Common stock, $0.01 par value per share; authorized 125,000,000 shares; issued 44,786,011 and 44,786,011 shares, outstanding 22,139,009 and 22,843,103 shares at December 31, 2022 and 2021, respectively	448	448
Additional paid-in capital	850,368	825,974
Treasury stock at cost (22,647,002 and 21,942,908 shares at December 31, 2022 and 2021, respectively)	(7,325,656)	(6,259,049)
Retained earnings	6,726,866	5,859,272
Accumulated other comprehensive income (loss)	(227,233)	(255,224)
Total shareholders' equity	24,793	171,421
Total liabilities and shareholders' equity	$ 3,492,395	$ 3,326,798

The accompanying notes are an integral part of these consolidated financial statements.

METTLER-TOLEDO INTERNATIONAL INC.
CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY
For the years ended December 31
(In thousands, except share data)

	Common Stock						
	Shares	Amount	Additional Paid-In Capital	Treasury Stock	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Total
Balance at December 31, 2019	24,125,317	$ 448	$ 783,871	$(4,539,154)	$ 4,499,288	$ (323,673)	$ 420,780
Exercise of stock options and restricted stock units	162,176	—	2,582	30,568	(6,431)	—	26,719
Repurchases of common stock	(815,652)	—	—	(774,998)	—	—	(774,998)
Share-based compensation	—	—	18,687	—	—	—	18,687
Net earnings	—	—	—	—	602,739	—	602,739
Other comprehensive income (loss), net of tax	—	—	—	—	—	(11,252)	(11,252)
Balance at December 31, 2020	23,471,841	$ 448	$ 805,140	$(5,283,584)	$ 5,095,596	$ (334,925)	$ 282,675
Exercise of stock options and restricted stock units	110,748	—	1,239	24,533	(5,309)	—	20,463
Repurchases of common stock	(739,486)	—	—	(999,998)	—	—	(999,998)
Share-based compensation	—	—	19,595	—	—	—	19,595
Net earnings	—	—	—	—	768,985	—	768,985
Other comprehensive income (loss), net of tax	—	—	—	—	—	79,701	79,701
Balance at December 31, 2021	22,843,103	$ 448	$ 825,974	$(6,259,049)	$ 5,859,272	$ (255,224)	$ 171,421
Exercise of stock options and restricted stock units	133,916	—	4,733	33,391	(4,908)	—	33,216
Repurchases of common stock	(838,010)	—	—	(1,099,998)	—	—	(1,099,998)
Share-based compensation	—	—	19,661	—	—	—	19,661
Net earnings	—	—	—	—	872,502	—	872,502
Other comprehensive income (loss), net of tax	—	—	—	—	—	27,991	27,991
Balance at December 31, 2022	22,139,009	$ 448	$ 850,368	$(7,325,656)	$ 6,726,866	$ (227,233)	$ 24,793

The accompanying notes are an integral part of these consolidated financial statements.

METTLER-TOLEDO INTERNATIONAL INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
For the years ended December 31
(In thousands)

	2022	2021	2020
Cash flows from operating activities:			
Net earnings	$ 872,502	$ 768,985	$ 602,739
Adjustments to reconcile net earnings to net cash provided by operating activities:			
Depreciation	46,784	44,982	42,044
Amortization	66,239	63,075	56,665
Deferred tax provision (benefit)	26,517	563	(12,784)
Share-based compensation	19,661	19,595	18,687
Increase in acquisition contingent consideration	—	6,849	—
Other	—	381	(2,399)
Increase (decrease) in cash resulting from changes in:			
Trade accounts receivable	(83,417)	(66,468)	(4,495)
Inventories	(43,392)	(118,718)	(3,836)
Other current assets	(16,263)	(5,040)	(4,763)
Trade accounts payable	(13,826)	93,973	(17,803)
Taxes payable	55,859	19,688	14,049
Accruals and other	(71,597)	80,960	36,595
Net cash provided by operating activities	859,067	908,825	724,699
Cash flows from investing activities:			
Proceeds from sale of property, plant, and equipment	399	3,652	3,106
Purchase of property, plant, and equipment	(121,241)	(107,580)	(92,494)
Proceeds from government grant	29,670	—	—
Acquisitions	(37,951)	(220,862)	(6,242)
Other investing activities	(10,272)	10,682	(4,730)
Net cash used in investing activities	(139,395)	(314,108)	(100,360)
Cash flows from financing activities:			
Proceeds from borrowings	2,307,256	2,427,519	1,489,040
Repayments of borrowings	(1,947,398)	(2,035,546)	(1,483,869)
Proceeds from exercise of stock options	33,216	20,463	26,719
Repurchases of common stock	(1,099,998)	(999,998)	(774,998)
Acquisition contingent consideration paid	(7,912)	—	—
Other financing activities	(1,203)	(2,987)	(800)
Net cash used in financing activities	(716,039)	(590,549)	(743,908)
Effect of exchange rate changes on cash and cash equivalents	(6,231)	142	6,038
Net increase (decrease) in cash and cash equivalents	(2,598)	4,310	(113,531)
Cash and cash equivalents:			
Beginning of period	98,564	94,254	207,785
End of period	$ 95,966	$ 98,564	$ 94,254
Supplemental disclosures of cash flow information:			
Cash paid during the year for:			
Interest	$ 52,314	$ 41,338	$ 37,772
Taxes	$ 114,038	$ 152,657	$ 134,674

The accompanying notes are an integral part of these consolidated financial statements.

1. *BUSINESS DESCRIPTION AND BASIS OF PRESENTATION*

Mettler-Toledo International Inc. (Mettler-Toledo or the Company) is a leading global supplier of precision instruments and services. The Company manufactures weighing instruments for use in laboratory, industrial, packaging, logistics, and food retailing applications. The Company also manufactures several related analytical instruments and provides automated chemistry solutions used in drug and chemical compound discovery and development. In addition, the Company manufactures metal detection and other end-of-line inspection systems used in production and packaging and provides solutions for use in certain process analytics applications. The Company’s primary manufacturing facilities are located in China, Switzerland, the United States, Germany, the United Kingdom, and Mexico. The Company’s principal executive offices are located in Columbus, Ohio and Greifensee, Switzerland.

The consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America (U.S. GAAP) and include all entities in which the Company has control, which are its wholly owned subsidiaries.

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, as well as disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting periods. Actual results may differ from those estimates due to uncertainty around the magnitude and duration of the COVID-19 pandemic and ongoing developments related to Ukraine, as well as other factors. A discussion of the Company's significant accounting policies is included in the Notes to the Consolidated Financial Statements included within this filing.

All intercompany transactions and balances have been eliminated.

2. *SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES*

Cash and Cash Equivalents

Cash and cash equivalents include highly liquid investments with original maturity dates of three months or less. The carrying value of these cash equivalents approximates fair value.

Trade Accounts Receivable

Trade accounts receivable are recorded at the invoiced amount and do not bear interest. The allowance for expected credit losses represents the Company’s best estimate based on current and historical information and reasonable and supportable forecasts of future events and circumstances.

Inventories

Inventories are valued at the lower of cost or net realizable value. Cost, which includes direct materials, labor, and overhead, is generally determined using the first in, first out (FIFO) method. The estimated net realizable value is based on assumptions for future demand and related pricing. Adjustments to the cost basis of the Company’s inventory are made for excess and obsolete items based on usage, expected future orders, and technological obsolescence. If actual market conditions are less favorable than those projected by management, reductions in the value of inventory may be required.

(In thousands, except share data, unless otherwise stated)

Long-Lived Assets

a) Property, Plant, and Equipment

Property, plant, and equipment are stated at cost less accumulated depreciation. Repair and maintenance costs are charged to expense as incurred. The Company capitalizes certain direct costs related to the acquisition and development of internal-use computer software. Externally purchased software is capitalized when we obtain legal ownership and is amortized over its useful life ranging from three to five years. Internally developed software costs for internal use are capitalized once the preliminary project stage is complete and it is probable that the project will be completed and the software will be used to perform the function intended. Costs associated with internal-use software are amortized on a straight-line basis over 10 years. Fully depreciated assets other than capitalized internally developed software are retained in property, plant, and equipment and accumulated depreciation accounts until disposal.

Depreciation and amortization are charged on a straight-line basis over the estimated useful lives of the assets as follows:

Buildings and improvements	15 to 50 years
Machinery and equipment	3 to 12 years
Computer software	3 to 10 years
Leasehold improvements	Shorter of useful life or lease term

In September 2021, the Company entered into an agreement with the U.S. Department of Defense to increase domestic production capacity of pipette tips and enhance manufacturing automation and logistics. The Company received $29.7 million of funding in 2022 and will receive $6.1 million in 2023, which offset capital expenditures. During the period ended December 31, 2022, the Company incurred approximately $28.1 million of capital expenditures relating to this funding agreement. In accordance with ASU 2021-10: Government Assistance, the Company applies guidance within IAS 20 - Accounting for Government Grants and Disclosure and accounts for the government agreement by reducing the cost of the asset within property, plant, and equipment in the consolidated balance sheets by the amount of the funds received.

b) Goodwill and Other Intangible Assets

Goodwill, representing the excess of purchase price over the fair value of the net assets of companies acquired, and indefinite-lived intangible assets are not amortized, but are reviewed for impairment annually in the fourth quarter, or more frequently if events or changes in circumstances indicate that an asset might be impaired. The annual evaluations of goodwill and indefinite-lived intangible assets are generally based on an assessment of qualitative factors to determine whether it is more likely than not that the fair value of the asset is less than its carrying amount.

If the Company is unable to conclude whether the goodwill or indefinite-lived intangible asset is not impaired after considering the totality of events and circumstances during its qualitative assessment, the Company performs a quantitative assessment by estimating the fair value of the respective reporting unit or indefinite-lived intangible asset and comparing the fair value to the carrying amount. If the carrying amount of the reporting unit or indefinite-lived intangible asset exceeds its fair value, an impairment charge equal to the difference is recognized.

Other intangible assets include indefinite-lived assets and assets subject to amortization. Where applicable, amortization is charged on a straight-line basis over the expected period to be benefited. The straight-line method of amortization reflects an appropriate allocation of the cost of the intangible assets to earnings in proportion to the amount of economic benefits obtained by the Company in each reporting period. The Company assesses the initial acquisition of intangible assets in accordance with the provisions of ASC 805 - Business Combinations and the continued accounting for previously recognized intangible assets and goodwill in accordance with the provisions of ASC 350 - Intangible - Goodwill and Other and ASC 360 - Property, Plant, and Equipment.

Accounting for Impairment of Long-Lived Assets

The Company assesses the need to record impairment losses on long-lived assets (asset group) with finite lives when events or changes in circumstances indicate that the carrying amount of assets may not be recoverable. An impairment loss would be recognized when future estimated undiscounted cash flows expected to result from use and eventually disposition of that asset (asset group) are less than the asset's carrying value, with the loss measured as the difference between carrying value and estimated fair value.

Taxation

The Company files tax returns in each jurisdiction in which it operates. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities, their respective tax bases, and operating loss and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates in the respective jurisdictions in which the Company operates. In assessing the ability to realize deferred tax assets, management considers whether it is more likely than not that some portion or all of the deferred tax assets will not be realized. The valuation allowance is based on management's estimates of future taxable income and application of relevant income tax law.

Deferred taxes are not provided on the unremitted earnings of subsidiaries outside of the United States when it is expected that these earnings are permanently reinvested. Such earnings may become taxable upon the sale or liquidation of these subsidiaries or upon the remittance of dividends. Deferred taxes are provided when the Company no longer considers subsidiary earnings to be permanently invested, such as in situations where the Company's subsidiaries plan to make future dividend distributions.

In accordance with the Tax Cuts and Jobs Act, the Company treats taxes due on future Global Intangible Low-Taxed Income (GILTI) inclusions in U.S. taxable income as a current period expense when incurred.

The Company recognizes accrued amounts of interest and penalties related to its uncertain tax positions as part of income tax expense within its consolidated statement of operations.

Currency Translation and Transactions

The reporting currency for the consolidated financial statements of the Company is the U.S. dollar. The functional currency for the Company's operations is generally the applicable local currency. Accordingly, the assets and liabilities of companies whose functional currency is other than the U.S. dollar are included in the consolidated financial statements by translating the assets and liabilities into the reporting currency at the exchange rates applicable at the end of the reporting period. The statements of operations and cash flows of such non-U.S. dollar functional currency operations are translated at the monthly weighted average exchange rates during the year. Translation gains or losses are accumulated in other comprehensive income (loss) in the consolidated statements of shareholders' equity. Transaction gains and losses are included as a component of net earnings or in certain circumstances as a component of other comprehensive income (loss) where the underlying item is considered a hedge of a net investment or relates to intercompany notes that are long term in nature.

Revenue Recognition

Product revenue is recognized from contracts with customers when a customer has obtained control of a product. The Company considers control to have transferred based upon shipping terms. To the extent the Company's contracts have a separate performance obligation, revenue related to any post-shipment performance obligation is deferred until completed. Shipping and handling costs charged to customers are included in total net sales and the associated expense is a component of cost of sales. Certain products are also sold through indirect distribution channels whereby the distributor assumes any further obligations to the end-customer. Revenue is recognized on these distributor arrangements upon transfer of control to the distributor. Contracts do not contain variable pricing arrangements that are retrospective, except for rebate programs. Rebates are estimated based on expected sales volumes and offset against revenue at the time such revenue is recognized. The Company generally maintains the right to accept or reject a product return in its terms and conditions and also maintains appropriate accruals for outstanding credits. The related provisions for estimated returns and rebates are immaterial to the consolidated financial statements.

Certain of the Company's product arrangements include separate performance obligations, primarily related to installation. Such performance obligations are accounted for separately when the deliverables have stand-alone value and the satisfaction of the undelivered performance obligations is probable and within the Company's control. The allocation of revenue between the performance obligations is based on the observable stand-alone selling prices at the time of the sale in accordance with a number of factors including service technician billing rates, time to install, and geographic location.

Software is generally not considered a distinct performance obligation with the exception of a limited number of small software applications. The Company primarily sells software products with the related hardware instrument as the software is embedded in the product. The Company's products typically require no significant production, modification, or customization of the hardware or software that is essential to the functionality of the products.

Service revenue not under contract is recognized upon the completion of the service performed. Revenue from spare parts sold on a stand-alone basis is recognized when control is transferred to the customer, which is generally at the time of shipment or delivery. Revenue from service contracts is recognized ratably over the contract period using a time-based method. These contracts represent an obligation to perform repair and other services including regulatory compliance qualification, calibration, certification, and preventative maintenance on a customer's pre-defined equipment over the contract period.

Leases

The Company considers an arrangement a lease if the arrangement transfers the right to control the use of an identified asset in exchange for consideration. The Company has operating leases, but does not have material financing leases.

Operating lease right-of-use assets represent the right to use an underlying asset for the lease term, and lease liabilities represent the obligation to make payments arising from the lease agreement. These assets and liabilities are recognized at the commencement of the lease based upon the present value of the lease payments over the lease term. Lease payments include both lease and non-lease components for items or activities that transfer a good and service. Vehicle lease and non-lease components are separately accounted for based on stand-alone value. Real estate lease and non-lease components are accounted for as a single component. Operating lease right-of-use assets include initial direct costs, advanced lease payments, and lease incentives.

The lease term reflects the noncancellable period of the lease together with periods covered by an option to extend or terminate the lease when management is reasonably certain that it will exercise such option. The Company applies its incremental borrowing rate at the lease commencement date in determining the present value of lease payments as the information necessary to determine the rate implicit in the lease is not readily available. The incremental borrowing rate reflects similar terms by geographic location to the underlying leases. The Company's lease agreements do not contain any material residual value guarantees or material restrictive covenants.

Lease expense for operating leases is recognized on a straight-line basis over the lease term. Variable lease payments consist of non-lease services related to the lease. Variable lease payments are excluded from the right-of-use asset and lease liabilities and are expensed as incurred. Short-term leases are less than one year without purchase or renewal options that are reasonably certain to be exercised and are recognized on a straight-line basis over the lease term. The right-of-use asset is tested for impairment in accordance with ASC 360.

Research and Development

Research and development costs primarily consist of salaries, consulting, and other costs. The Company expenses these costs as incurred.

Employee Termination Benefits

In situations where contractual termination benefits exist, the Company records accruals for employee termination benefits when it is probable that a liability has been incurred and the amount of the liability is reasonably estimable. All other employee termination arrangements are recognized and measured at their fair value at the communication date unless the employee is required to render additional service beyond the legal notification period, in which case the liability is recognized ratably over the future service period.

Earnings per Common Share

In accordance with the treasury stock method, the Company has included 226,500, 327,768, and 316,582 common equivalent shares in the calculation of diluted weighted average number of common shares for the years ended December 31, 2022, 2021, and 2020, respectively, relating to outstanding stock options and restricted stock units.

Outstanding options and restricted stock units to purchase or receive 42,855, 24,036, and 36,263 shares of common stock for the years ended December 31, 2022, 2021, and 2020, respectively, have been excluded from the calculation of diluted weighted average number of common and common equivalent shares as such options and restricted stock units would be anti-dilutive.

Equity-Based Compensation

The Company applies the fair value methodology in accounting for its equity-based compensation plan.

Derivative Financial Instruments

The Company has limited involvement with derivative financial instruments and does not use them for trading purposes. As described more fully in Note 6, the Company primarily enters into foreign currency forward exchange contracts to economically hedge certain short-term intercompany balances involving its international businesses. Such contracts limit the Company's exposure to currency fluctuations on the underlying hedged item. These contracts are adjusted to fair market value as of each balance sheet date, with the resulting changes in fair value being recognized in other charges (income), consistent with the underlying hedged item.

The Company also enters into interest rate swap agreements and cross currency swaps in order to manage its exposure to changes in interest rates. The differential paid or received on interest rate swap agreements is recognized as incurred in interest expense over the life of the hedge agreements. Floating to fixed interest rate swap agreements are accounted for as cash flow hedges. Changes in fair value of outstanding interest rate swap agreements that are effective as cash flow hedges are initially recognized in other comprehensive income as incurred.

Fair Value Measurements

The Company measures or monitors certain assets and liabilities on a fair value basis. Fair value is used on a recurring basis for assets and liabilities in which fair value is the primary basis of accounting, mainly derivative instruments. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. When determining the fair value measurements for assets and liabilities required to be recorded at fair value, the Company considers the principal or most advantageous market in which it would transact and considers assumptions that market participants would use when pricing the asset or liability. The Company applies the fair value hierarchy established under U.S. GAAP and when possible looks to active and observable markets to price identical assets and liabilities. If identical assets and liabilities are not traded in active markets, the Company looks to observable market data for similar assets and liabilities.

Business Combinations and Asset Acquisitions

The Company accounts for business acquisitions under the accounting standards for business combinations. The results of each acquisition are included in the Company's consolidated results as of the acquisition date. The purchase price of an acquisition is allocated to tangible and intangible assets and assumed liabilities based on their estimated fair values and any consideration in excess of the net assets acquired is recognized as goodwill. Acquisition transaction costs are expensed when incurred.

In circumstances where an acquisition involves a contingent consideration arrangement, the Company recognizes a liability equal to the fair value of the expected contingent payments as of the acquisition date. Subsequent changes in the fair value of the contingent consideration are recorded to other charges (income), net.

Recent Accounting Pronouncements

In March 2020 and January 2021, the FASB issued ASU 2020-04 and ASU 2021-01: Reference Rate Reform, which provides optional expedients and exceptions for applying GAAP to contracts, hedging relationships, and other transactions affected by the discontinuance of LIBOR or another referenced rate. The guidance may be applied to any applicable contract entered into before December 31, 2022. The Company's interest rate and cross currency swaps, as mentioned in Note 6 to the consolidated financial statements, are governed by International Swaps and Derivatives Association (ISDA) agreements, and the

(In thousands, except share data, unless otherwise stated)

Company will adhere to the ISDA's fallback protocol when LIBOR is discontinued. In addition, the Company renewed the LIBOR-based credit agreement, as discussed further in Note 10, which includes a fallback protocol when LIBOR is discontinued. Based on these procedures, when LIBOR is discontinued, the interest rate and cross currency swaps will not require de-designation if certain criteria are met. The Company expects the financial impact of the rate change when LIBOR is discontinued to be immaterial to its financial statements.

In November 2021, the FASB issued ASU 2021-10: Government Assistance, which increases the transparency of government assistance including the disclosure of the types of assistance, an entity's accounting for the assistance, and the effect of the assistance on an entity's financial statements. The Company early adopted this guidance on a prospective basis in the fourth quarter of 2021. The adoption of this guidance did not have a material impact on the Company's disclosures.

3. REVENUE

The Company disaggregates revenue from contracts with customers by product, service, timing of revenue recognition, and geography. A summary by the Company’s reportable segments follows for the years ended December 31:

Twelve months ended December 31, 2022	U.S. Operations	Swiss Operations	Western European Operations	Chinese Operations	Other Operations	Total
Product Revenue	$ 1,113,983	$ 139,490	$ 581,168	$ 777,276	$ 506,804	$ 3,118,721
Service Revenue:						
Point in time	256,837	27,800	134,781	46,931	121,786	588,135
Over time	73,640	8,829	83,982	17,319	29,083	212,853
Total	$ 1,444,460	$ 176,119	$ 799,931	$ 841,526	$ 657,673	$ 3,919,709

Twelve months ended December 31, 2021	U.S. Operations	Swiss Operations	Western European Operations	Chinese Operations	Other Operations	Total
Product Revenue	$ 1,004,891	$ 135,987	$ 600,527	$ 707,355	$ 511,855	$ 2,960,615
Service Revenue:						
Point in time	218,306	26,764	151,656	48,343	120,860	565,929
Over time	64,786	8,882	77,578	15,953	24,187	191,386
Total	$ 1,287,983	$ 171,633	$ 829,761	$ 771,651	$ 656,902	$ 3,717,930

Twelve months ended December 31, 2020	U.S. Operations	Swiss Operations	Western European Operations	Chinese Operations	Other Operations	Total
Product Revenue	$ 815,046	$ 112,542	$ 509,385	$ 526,231	$ 441,968	$ 2,405,172
Service Revenue:						
Point in time	199,247	22,733	135,793	39,705	110,542	508,020
Over time	58,026	8,648	71,537	12,674	21,100	171,985
Total	$ 1,072,319	$ 143,923	$ 716,715	$ 578,610	$ 573,610	$ 3,085,177

(In thousands, except share data, unless otherwise stated)

The Company's global revenue mix by product category for the year ended December 31, 2022 is laboratory (57% of sales), industrial (38% of sales), and retail (5% of sales). The Company's product revenue by reportable segment is proportionately similar to the Company's global mix with the exception of the Company's Swiss Operations, which is largely comprised of laboratory products, and the Company's Chinese Operations, which has a slightly higher percentage of industrial products. A breakdown of the Company's sales by product category for the year ended December 31 follows:

	2022	2021	2020
Laboratory	$ 2,230,381	$ 2,083,025	$ 1,669,791
Industrial	1,510,554	1,446,544	1,224,497
Retail	178,774	188,361	190,889
Total net sales	$ 3,919,709	$ 3,717,930	$ 3,085,177

A breakdown of net sales to external customers by geographic customer destination, net for the year ended December 31 follows:

	2022	2021	2020
Americas	$ 1,582,493	$ 1,419,832	$ 1,180,626
Europe	1,014,360	1,062,961	921,266
Asia/Rest of World	1,322,856	1,235,137	983,285
Total	$ 3,919,709	$ 3,717,930	$ 3,085,177

The payment terms in the Company's contracts with customers do not exceed one year and therefore contracts do not contain a significant financing component. In most cases, after appropriate credit evaluations, payments are due in arrears and are recognized as receivables. Unbilled revenue is recorded when performance obligations have been satisfied, but not yet billed to the customer. Unbilled revenue as of December 31, 2022 and 2021 was $29.2 million and $32.1 million, respectively, and is included within accounts receivable. Deferred revenue and customer prepayments are recorded when cash payments are received or due in advance of the performance obligation being satisfied. Deferred revenue primarily includes prepaid service contracts, as well as deferred installation.

Changes in the components of deferred revenue and customer prepayments during the period are as follows:

	2022	2021	2020
Beginning balances as of January 1	$ 192,648	$ 149,106	$ 122,489
Customer prepayments/deferred revenue	731,482	711,067	617,643
Revenue recognized	(720,362)	(667,245)	(595,802)
Foreign currency translation	(11,009)	(280)	4,776
Ending balance as of December 31	$ 192,759	$ 192,648	$ 149,106

The Company generally expenses sales commissions when incurred because the contract period is one year or less. These costs are recorded within selling, general, and administrative expenses. The value of unsatisfied performance obligations other than customer prepayments and deferred revenue associated with contracts greater than one year is immaterial.

4. ACQUISITIONS

In March 2021, the Company acquired all the membership interests of Mayfair Technology, LLC (PendoTECH), a manufacturer and distributor of single-use sensors, transmitters, control systems, and software for measuring, monitoring, and data collection primarily in bioprocess applications. PendoTECH serves biopharmaceutical manufacturers and life science laboratories and is located in the United States. The initial cash payment was $185.0 million and the Company made other post-closing payments of $7.4 million. The Company may be required to pay additional consideration of up to $20.0 million, which is based upon financial thresholds in 2022 and 2023. The estimated fair value of the contingent consideration obligation at the time of acquisition of $13.5 million was determined using a Monte Carlo simulation based on the Company's forecast of future financial results. During the fourth quarter of 2021, the Company increased the contingent consideration obligation to $20.0 million, based upon actual results and future financial projections, plus related obligations of $0.3 million due to the sellers. The $6.8 million increase to the contingent consideration and related obligations to the sellers was recorded in other charges (income), net. As of December 31, 2022, the $10.0 million of additional consideration has been paid and the Company expects to pay an additional $10.0 million in 2023.

Goodwill recorded in connection with the acquisition totaled $93.1 million, which is deductible for tax purposes. Identified intangible finite-lived assets acquired include customer relationships of $78.6 million, technology and patents of $21.7 million, trade name of $3.4 million, and other intangibles of $2.4 million. The Company used variations of the income statement approach in determining the fair value of the intangible assets acquired. Specifically, the multi-period excess earnings method was used to determine the fair value of the customer relationships acquired and the relief from royalty method was used to determine the fair value of the technology and patents. The Company's determination of the fair value of the intangible assets acquired involved the use of significant estimates and assumptions principally related to revenue growth, royalty, and customer attrition rates.

The identifiable finite-lived intangible assets will be amortized on a straight-line basis over periods of 5 to 20 years and the annual aggregate amortization expense is estimated at $6.9 million. Net tangible assets acquired were $7.4 million and were recorded at fair value in the consolidated financial statements. All of the acquired assets are included in the Company's U.S. Operations segment.

In October 2021, the Company acquired Scale-up Systems Inc., a leading software provider for scale-up and reaction modeling serving the biopharma and chemical markets. The initial cash payment was $20.2 million and the Company may be required to pay additional amounts up to EUR 3.0 million. As of December 31, 2022 the Company has paid EUR 0.6 million and expects to pay an additional EUR 1.3 million in 2023. Goodwill recorded in connection with the acquisition totaled $11.1 million, which is deductible for tax purposes. The Company also recorded $11.4 million of identifiable finite-lived intangibles primarily pertaining to technology and patents and customer relationships in connection with this acquisition, which will be amortized on a straight-line basis over 7 to 10 years. All of the acquired assets are included in the Company's Western European Operations segment.

In 2022, the Company incurred additional acquisition payments totaling $38.0 million. The Company recorded $28.4 million of identified intangibles primarily pertaining to customer relationships in connection with these acquisitions, which will be amortized on a straight-line basis over 2 to 15 years. Goodwill recorded in connection with these acquisitions totaled $18.6 million.

In 2021 and 2020, the Company also incurred additional acquisition payments totaling $8.3 million and $6.2 million, respectively.

(In thousands, except share data, unless otherwise stated)

5. *INVENTORIES*

Inventories consisted of the following at December 31:

	2022	2021
Raw materials and parts	$ 222,170	$ 184,624
Work-in-progress	77,848	76,019
Finished goods	141,676	153,900
Total inventory	$ 441,694	$ 414,543

6. *FINANCIAL INSTRUMENTS*

The Company has limited involvement with derivative financial instruments and does not use them for trading purposes. The Company enters into certain interest rate and cross currency swap agreements in order to manage its exposure to changes in interest rates. The amount of the Company's fixed obligation interest payments may change based upon the expiration dates of its interest rate and cross currency swap agreement and the level and composition of its debt. The Company also enters into certain foreign currency forward contracts to limit the Company's exposure to currency fluctuations on the respective hedged items. For additional disclosures on derivative instruments regarding balance sheet location, fair value, and the amounts reclassified into other comprehensive income and the effective portion of the cash flow hedges, also see Note 7 and Note 11 to the consolidated financial statements. As also mentioned in Note 10, the Company has designated its euro-denominated debt as a hedge of a portion of its net investment in a euro-denominated foreign subsidiary.

Cash Flow Hedges

In November 2021, the Company entered into a cross currency swap arrangement designated as a cash flow hedge. The agreement converts $50 million of borrowings under the Company's credit facility into synthetic Swiss franc debt, which allows the Company to effectively change the floating rate LIBOR-based interest payments, excluding the credit spread, to a fixed Swiss franc income of 0.64%. The swap matures in November 2023.

In June 2021, the Company entered into a cross currency swap arrangement designated as a cash flow hedge. The agreement converts $50 million of borrowings under the Company's credit facility into synthetic Swiss franc debt, which allows the Company to effectively change the floating rate LIBOR-based interest payments, excluding the credit spread, to a fixed Swiss franc income of 0.57%. The swap matures in June 2025. This cross currency swap replaced a similar $50 million swap entered into in June 2019 which matured in June 2021, which converted floating rate LIBOR to a fixed Swiss franc income of 0.95%.

In June 2021, the Company entered into a cross currency swap arrangement designated as a cash flow hedge. The agreement converts $50 million of borrowings under the Company's credit facility into synthetic Swiss franc debt, which allows the Company to effectively change the floating rate LIBOR-based interest payments, excluding the credit spread, to a fixed Swiss franc income of 0.66%. The swap matures in June 2024. This cross currency swap replaced a similar $50 million swap entered into in February 2019 and matured in June 2021, which converted floating rate LIBOR to a fixed Swiss franc income of 0.78%.

In June 2019, the Company entered into a cross currency swap arrangement designated as a cash flow hedge. The agreement converts $50 million of borrowings under the Company's credit facility into synthetic Swiss franc debt, which allows the Company to effectively change the floating rate LIBOR-based interest payment, excluding the credit spread, to a fixed Swiss franc income of 0.82%. The swap matures in June 2023.

In 2015, the Company entered into a forward-starting interest rate swap agreement. The agreement changes the floating rate LIBOR-based interest payments associated with $100 million in borrowings under the Company’s credit agreement to a fixed obligation of 2.25%, which began in February 2017 and matured in February 2022.

The Company’s cash flow hedges are recorded gross at fair value in the consolidated balance sheet at December 31, 2022 and 2021 and are disclosed in Note 7 to the consolidated financial statements. A derivative gain of $7.3 million based upon interest rates at December 31, 2022 is expected to be reclassified from other comprehensive income (loss) to earnings in the next 12 months. Through December 31, 2022, no hedge ineffectiveness has occurred in relation to these cash flow hedges.

Other Derivatives

The Company primarily enters into foreign currency forward contracts in order to economically hedge short-term intercompany balances largely denominated in Swiss franc, other major European currencies, and the Chinese renminbi with its foreign businesses. In accordance with U.S. GAAP, these contracts are considered “derivatives not designated as hedging instruments.” Gains or losses on these instruments are reported in current earnings. The foreign currency forward contracts are recorded at fair value in the consolidated balance sheet at December 31, 2022 and 2021, as disclosed in Note 7 to the consolidated financial statements. The Company recognized in other charges (income), net loss of $21.6 million and a net gain of $13.5 million and $4.8 million during the years ended December 31, 2022, 2021, and 2020, respectively, which offset the related net transaction gains (losses) associated with these contracts. At December 31, 2022 and 2021, these contracts had a notional value of $930.3 million and $1.0 billion, respectively.

The Company may be exposed to credit losses in the event of nonperformance by the counterparties to its derivative financial instrument contracts. Counterparties are established banks and financial institutions with high credit ratings. The Company believes that such counterparties will be able to fully satisfy their obligations under these contracts.

7. *FAIR VALUE MEASUREMENTS*

At December 31, 2022 and 2021, the Company had derivative assets totaling $11.5 million and $6.0 million, respectively, and derivative liabilities totaling $5.4 million and $10.3 million, respectively. The Company has limited involvement with derivative financial instruments and therefore does not present all the required disclosures in tabular format. The fair values of the interest rate swap agreements, the cross currency swap agreements, and the foreign currency forward contracts that economically hedge short-term intercompany balances are estimated based upon inputs from current valuation information obtained from dealer quotes and priced with observable market assumptions and appropriate valuation adjustments for credit risk. The Company has evaluated the valuation methodologies used to develop the fair values by dealers in order to determine whether such valuations are representative of an exit price in the Company’s principal market. In addition, the Company uses an internally developed model to perform testing on the valuations received from brokers. The Company has also considered both its own credit risk and counterparty credit risk in determining fair value and determined these adjustments were insignificant for the years ended December 31, 2022 and 2021.

(In thousands, except share data, unless otherwise stated)

Under U.S. GAAP, fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. A fair value measurement consists of observable and unobservable inputs that reflect the assumptions that a market participant would use in pricing an asset or liability.

A fair value hierarchy has been established that categorizes these inputs into three levels:

Level 1: Quoted prices in active markets for identical assets and liabilities

Level 2: Observable inputs other than quoted prices in active markets for identical assets and liabilities

Level 3: Unobservable inputs

The following table presents the Company's assets and liabilities, which are all categorized as Level 2 and are measured at fair value on a recurring basis at December 31, 2022 and 2021. The Company does not have any assets or liabilities which are categorized as Level 1.

	2022	2021	Balance Sheet Location
Foreign currency forward contracts not designated as hedging instruments	$ 3,958	$ 3,927	Other current assets and prepaid expenses
Cash flow hedges:			
Cross currency swap agreement	609	—	Other current assets and prepaid expenses
Cross currency swap agreement	6,890	2,119	Other non-current assets
Total derivative assets	$11,457	$ 6,046	
Foreign currency forward contracts not designated as hedging instruments	$ 2,056	$ 4,510	Accrued and other liabilities
Cash flow hedges:			
Interest rate swap agreements	—	352	Accrued and other liabilities
Cross currency swap agreements	3,366	—	Accrued and other liabilities
Cross currency swap agreements	—	5,482	Other non-current liabilities
Total derivative liabilities	$ 5,422	$10,344	

The Company had $25.3 million and $18.5 million of cash equivalents at December 31, 2022 and 2021, respectively, the fair value of which is determined using Level 2 inputs through quoted and corroborated prices in active markets. The fair value of cash equivalents approximates cost.

The fair value of the Company's debt is less than the carrying value by approximately $258.6 million as of December 31, 2022. The fair value of the Company's fixed interest rate debt was estimated using Level 2 inputs and primarily discounted cash flow models, based on estimated current rates offered for similar debt under current market conditions for the Company.

During the period ended December 31, 2022, $10.0 million of contingent consideration was paid relating to the PendoTECH acquisition of which $7.9 million is included in financing activities for the amount accrued at the acquisition date and $2.1 million is included in operating activities for the amount not accrued at the acquisition date on the Consolidated Statement of Cash Flows in accordance with U.S.

(In thousands, except share data, unless otherwise stated)

GAAP. The estimated fair value of the remaining contingent consideration obligation of $10.0 million as of December 31, 2022 is based upon actual results and future financial projections. The fair value measurements are based on significant inputs not observable in the market and thus represent a Level 3 measurement.

8. *PROPERTY, PLANT, AND EQUIPMENT, NET*

Property, plant, and equipment, net consisted of the following at December 31:

	2022	2021
Land	$ 61,072	$ 61,883
Building and leasehold improvements	372,398	367,846
Machinery and equipment	488,915	473,914
Computer software	512,494	502,198
Property, plant, and equipment, gross	1,434,879	1,405,841
Less accumulated depreciation and amortization	(656,279)	(606,476)
Property, plant, and equipment, net	$ 778,600	$ 799,365

9. *GOODWILL AND OTHER INTANGIBLE ASSETS*

The following table shows the changes in the carrying amount of goodwill for the years ended December 31:

	2022	2021
Balance at beginning of year	$ 648,622	$ 550,270
Goodwill acquired	18,644	103,882
Foreign currency translation	(7,096)	(5,530)
Balance at year end	$ 660,170	$ 648,622

Goodwill and indefinite-lived assets are reviewed for impairment on an annual basis in the fourth quarter. The Company completed its impairment review and determined that there had been no impairment of these assets through December 31, 2022. The Company identified no triggering events or other circumstances which indicated the carrying amount of goodwill or intangible assets may not be recoverable.

The components of other intangible assets as of December 31 are as follows:

	2022			2021		
	Gross Amount	Accumulated Amortization	Intangibles, Net	Gross Amount	Accumulated Amortization	Intangibles, Net
Customer relationships	$ 292,713	$ (92,981)	$ 199,732	$ 282,470	$ (79,782)	$ 202,688
Proven technology and patents	123,623	(64,089)	59,534	115,680	(56,305)	59,375
Tradenames (finite life)	7,675	(3,543)	4,132	8,206	(3,731)	4,475
Tradenames (indefinite life)	36,252	—	36,252	35,949	—	35,949
Other	13,271	(6,867)	6,404	10,641	(5,678)	4,963
	$ 473,534	$ (167,480)	$ 306,054	$ 452,946	$ (145,496)	$ 307,450

The Company recognized amortization expense associated with the above intangible assets of $26.5 million, $22.5 million, and $15.7 million for the years ended December 31, 2022, 2021, and 2020, respectively. The annual aggregate amortization expense based on the current balance of other intangible assets is estimated at $27.8 million for 2023, $27.7 million for 2024, $27.0 million for 2025, $22.3 million for 2026, and $20.8 million for 2027. The finite-lived intangible assets are amortized on a straight-line basis over periods ranging from 3 to 45 years. The straight-line method of amortization reflects an appropriate allocation of the cost of the intangible assets to earnings in proportion to the amount of economic benefits obtained by the Company in each reporting period. Purchased intangibles amortization was $25.5 million, $19.8 million after tax, $21.6 million, $16.3 million after tax, and $14.9 million, $11.2 million after tax, for the years ended December 31, 2022, 2021, and 2020, respectively.

(In thousands, except share data, unless otherwise stated)

In addition to the above amortization, the Company recorded amortization expense associated with capitalized software, which is included in property, plant, and equipment in Note 8, of $39.6 million, $40.4 million, and $40.7 million for the years ended December 31, 2022, 2021, and 2020, respectively.

10. DEBT

Debt consisted of the following at December 31:

	2022	2021
3.67% $50 million 10-year Senior Notes due December 17, 2022	$ —	$ 50,000
4.10% $50 million 10-year Senior Notes due September 19, 2023	50,000	50,000
3.84% $125 million 10-year Senior Notes due September 19, 2024	125,000	125,000
4.24% $125 million 10-year Senior Notes due June 25, 2025	125,000	125,000
3.91% $75 million 10-year Senior Notes due June 25, 2029	75,000	75,000
2.83% $125 million 12-year Senior Notes due July 22, 2033	125,000	125,000
3.19% $50 million 15-year Senior Notes due January 24, 2035	50,000	50,000
2.81% $150 million 15-year Senior Notes due March 17, 2037	150,000	—
2.91% $150 million 15-year Senior Notes due September 1, 2037	150,000	—
1.47% EUR 125 million 15-year Senior Notes due June 17, 2030	133,794	141,789
1.30% EUR 135 million 15-year Senior Notes due November 6, 2034	144,497	153,132
1.06% EUR 125 million 15-year Senior Notes due March 19, 2036	133,794	141,789
Senior Notes debt issuance costs, net	(4,521)	(4,115)
Total Senior Notes	1,257,564	1,032,595
$1.25 billion Credit Agreement, interest at LIBOR plus 87.5 basis points[(1)]	697,211	595,041
Other local arrangements	59,759	54,306
Total debt	2,014,534	1,681,942
Less: current portion	(106,054)	(101,134)
Total long-term debt	$ 1,908,480	$ 1,580,808

(1) See Note 6 and Note 7 for additional disclosures on the financial instruments associated with the Credit Agreement.

At December 31, 2022, the interest payments associated with 73% of the Company’s debt are fixed obligations. The Company’s weighted average interest rate was 2.8% and 2.7% for the years ended December 31, 2022 and 2021, respectively.

Senior Notes

The Senior Notes listed above are senior unsecured obligations of the Company and interest is payable semi-annually. The Company may at any time prepay the Senior Notes, in whole or in part, at a price equal to 100% of the principal amount thereof, plus accrued and unpaid interests, and in some instances a "make whole" prepayment premium. The Euro Senior Notes, if prepaid, may also include a swap related currency loss. The Senior Notes each contain customary affirmative and negative covenants including, among others, limitations on the Company and its subsidiaries with respect to incurrence of liens and priority indebtedness, disposition of assets, mergers, and transactions with affiliates. In December 2021, the Company amended all of its U.S. Senior Note agreements to conform to the financial covenants in the underlying agreements. The amended agreements require the Company to maintain a consolidated interest coverage ratio of not less than 3.0 to 1.0 and a net consolidated leverage ratio of not more than 3.5 to 1.0. The Senior Notes also contain customary events of default with customary grace periods, as applicable. The Company was in compliance with its covenants at December 31, 2022.

Total issuance costs of approximately $4.5 million have been incurred by the Company related to the Senior Notes mentioned above and are being amortized to interest expense over the various terms.

In December 2022, the Company entered into an agreement to issue and sell $150 million 10-year Senior Notes in a private placement. The Company will issue $150 million with a fixed interest rate of 5.45% (5.45% Senior Notes) in March 2023. The 5.45% Senior Notes will be senior unsecured obligations of the Company. The 5.45% Senior Notes mature on March 1, 2033. The terms of the 5.45% Senior Notes are consistent with the previous Senior Notes as described above. The Company will use the proceeds from the sale of the 5.45% Senior Notes to refinance existing indebtedness and for other general corporate purposes.

In December 2021, the Company entered into an agreement to issue and sell $300 million 15-year Senior Notes in a private placement. The Company issued $150 million with a fixed interest rate of 2.81% (2.81% Senior Notes) in March 2022 and $150 million with a fixed interest rate of 2.91% (2.91% Senior Notes) in September 2022. The 2.81% and 2.91% Senior Notes are senior unsecured obligations of the Company. The 2.81% Senior Notes mature in March 2037, and the 2.91% Senior Notes mature in September 2037. Interest on the 2.81% and 2.91% Senior Notes is payable semi-annually in March and September each year. Interest payments on the 2.81% Senior Notes began in September 2022 and interest payments on the 2.91% will begin in March 2023. The terms of the 2.81% and 2.91% Senior Notes are consistent with the previous Senior Notes as described above. The Company used the proceeds from the sale of the 2.81% and 2.91% Senior Notes to refinance existing indebtedness and for other general corporate purposes.

In May 2021, the Company entered into an agreement to issue and sell $125 million 12-year Senior Notes with a fixed interest rate of 2.83%. The Senior Notes were issued in July 2021 and will mature in July 2033. The terms of the Senior Notes are consistent with the previous Senior Notes as described above. The Company used the proceeds from the sale of the notes to refinance existing indebtedness and for other general corporate purposes.

In December 2020, the Company entered into an agreement to issue and sell EUR 125.0 million 15-year 1.06% Euro Senior Notes (1.06% Euro Senior Notes). The terms of the Euro Senior Notes are consistent with the previous Euro Senior Notes as described above. The Company also entered into a forward contract to receive $152.1 million at the time of issuing the 1.06% Euro Senior Notes in March 2021. The proceeds were used to repay outstanding amounts on the Company's credit facility and fund operational expenses. The 1.06% Euro Senior Notes were designated as a hedge of a portion of the Company's net investment in a euro-denominated foreign subsidiary to reduce foreign currency risk associated with this net investment.

The Company has designated the EUR 125 million 1.47% Euro Senior Notes, the EUR 135 million 1.30% Euro Senior Notes, and the EUR 125 million 1.06% Euro Senior Notes as a hedge of a portion of its net investment in a euro-denominated foreign subsidiary to reduce foreign currency risk associated with this net investment. Changes in the carrying value of this debt resulting from fluctuations in the euro to U.S. dollar exchange rate are recorded as foreign currency translation adjustments within other comprehensive income (loss). The Company recorded in other comprehensive income (loss) related to this net investment hedge an unrealized gain of $24.6 million and $34.3 million, and an unrealized loss of $27.3 million for the years ended December 31, 2022, 2021, and 2020, respectively. The Company has an unrealized gain of $30.1 million recorded in accumulated other comprehensive income (loss) as of December 31, 2022.

Credit Agreement

On June 25, 2021, the Company entered into a $1.25 billion Credit Agreement (the Credit Agreement), which amended its $1.1 billion Amended and Restated Credit Agreement (the Prior Credit Agreement). As of December 31, 2022, the Company had $547.0 million of additional borrowings available under its Credit Agreement.

The Credit Agreement is provided by a group of financial institutions (similar to the Company's Prior Credit Agreement) and has a maturity date of June 25, 2026. It is a revolving credit facility and is not subject to any scheduled principal payments prior to maturity. The obligations under the Credit Agreement are unsecured.

Borrowings under the Credit Agreement bear interest at current market rates plus a margin based on the Company’s consolidated leverage ratio. The Company must also pay facility fees that are tied to its leverage ratio. The Credit Agreement contains covenants that are similar to those contained in the Prior Credit Agreement, with which the Company was in compliance as of December 31, 2022. The Company is required to maintain (i) a ratio of net funded indebtedness to EBITDA of 3.5 to 1.0 or less except in certain circumstances and (ii) an interest coverage ratio of 3.0 to 1.0 or greater. The Credit Agreement also places certain limitations on the Company, including limiting the ability to incur liens or indebtedness at a subsidiary level. In addition, the Credit Agreement has several events of default, with customary grace periods as applicable. The Company capitalized $2.0 million in financing fees during 2021 associated with the Credit Agreement, which will be amortized to interest expense through 2026.

Other Local Arrangements

In April 2018, two of the Company’s non-U.S. pension plans issued loans totaling $39.6 million (Swiss franc 38 million) to a wholly owned subsidiary of the Company. The loans have the same terms and conditions, which include an interest rate of SARON plus 87.5 basis points. The loans were renewed for one year in April 2022.

11. *SHAREHOLDERS’ EQUITY*

Common Stock

The number of authorized shares of the Company’s common stock is 125,000,000 shares with a par value of $0.01 per share. Holders of the Company’s common stock are entitled to one vote per share. At December 31, 2022, 3,858,825 shares of the Company’s common stock were reserved for issuance pursuant to the Company’s stock option plans.

Preferred Stock

The Board of Directors, without further shareholder authorization, is authorized to issue up to 10,000,000 shares of preferred stock, par value $0.01 per share in one or more series and to determine and fix the rights, preferences, and privileges of each series, including dividend rights and preferences over dividends on the common stock and one or more series of the preferred stock, conversion rights, voting rights (in addition to those provided by law), redemption rights, and the terms of any sinking fund therefore, and rights upon liquidation, dissolution, or winding up, including preferences over the common stock and one or more series of the preferred stock. The issuance of shares of preferred stock, or the issuance of rights to purchase such shares, may have the effect of delaying, deferring, or preventing a change in control of the Company or an unsolicited acquisition proposal.

Share Repurchase Program

In November 2022, the Company's Board of Directors authorized an additional $2.5 billion to the share repurchase program, which had $3.5 billion of remaining availability as of December 31, 2022. The share repurchases are expected to be funded from cash generated from operating activities, borrowings, and cash balances. Repurchases will be made through open market transactions, and the amount and timing of purchases will depend on business and market conditions, the stock price, trading restrictions, the level of acquisition activity, and other factors.

The Company has purchased 31.0 million of common shares since the inception of the program in 2004 through December 31, 2022, at a total cost of $8.0 billion. The Company spent $1.1 billion, $1.0 billion and $775 million during 2022, 2021 and 2020, respectively on the repurchase of 838,010 shares, 739,486 shares, and 815,652 shares at an average price per share of $1,312.61, $1,352.27, and $950.14, respectively. The Company reissued 133,916 shares, 110,748 shares, and 162,176 shares held in treasury for the exercise of stock options and restricted stock units during 2022, 2021, and 2020, respectively.

(In thousands, except share data, unless otherwise stated)

Accumulated Other Comprehensive Income (Loss)

The following table presents changes in accumulated other comprehensive income by component for the period ended December 31, 2022, 2021, and 2020:

	Currency Translation Adjustment, Net of Tax	Net Unrealized Gain (Loss) on Cash Flow Hedging Arrangements, Net of Tax	Pension and Post-Retirement Benefit Related Items, Net of Tax	Total
Balance at December 31, 2019	$ (61,015)	$ (1,222)	$ (261,436)	$ (323,673)
Other comprehensive income (loss), net of tax:				
Net unrealized actuarial gains (loss), prior service cost, and plan amendments	—	—	(35,755)	(35,755)
Net unrealized gains (loss) on cash flow hedging arrangements	—	(11,323)	—	(11,323)
Foreign currency translation adjustment	29,914	—	(19,701)	10,213
Amounts recognized from accumulated other comprehensive income (loss), net of tax	—	11,066	14,547	25,613
Net change in other comprehensive income (loss), net of tax	29,914	(257)	(40,909)	(11,252)
Balance at December 31, 2020	$ (31,101)	$ (1,479)	$ (302,345)	$ (334,925)
Other comprehensive income (loss), net of tax:				
Net unrealized actuarial gains (loss), prior service cost, and plan amendments	—	—	38,124	38,124
Net unrealized gains (loss) on cash flow hedging arrangements	—	4,394	—	4,394
Foreign currency translation adjustment	11,535	—	9,235	20,770
Amounts recognized from accumulated other comprehensive income (loss), net of tax	—	(2,913)	19,326	16,413
Net change in other comprehensive income (loss), net of tax	11,535	1,481	66,685	79,701
Balance at December 31, 2021	$ (19,566)	$ 2	$ (235,660)	$ (255,224)
Other comprehensive income (loss), net of tax:				
Net unrealized actuarial gains (loss), prior service cost, and plan amendments	—	—	70,663	70,663
Net unrealized gains (loss) on cash flow hedging arrangements	—	10,029	—	10,029
Foreign currency translation adjustment	(63,298)	—	3,094	(60,204)
Amounts recognized from accumulated other comprehensive income (loss), net of tax	—	(5,775)	13,278	7,503
Net change in other comprehensive income (loss), net of tax	(63,298)	4,254	87,035	27,991
Balance at December 31, 2022	$ (82,864)	$ 4,256	$ (148,625)	$ (227,233)

(In thousands, except share data, unless otherwise stated)

The following table presents amounts recognized from accumulated other comprehensive income (loss) during the years ended December 31, 2022, 2021, and 2020:

	2022	2021	2020	Location of Amounts Recognized in Earnings
Effective portion of losses (gains) on cash flow hedging arrangements:				
Interest rate swap agreements	$ 352	$ 2,178	$ 2,413	Interest expense
Cross currency swap	(7,454)	(5,604)	11,531	(a)
Total before taxes	(7,102)	(3,426)	13,944	
Provision for taxes	(1,327)	(513)	2,878	Provision for taxes
Total, net of taxes	$ (5,775)	$ (2,913)	$ 11,066	
Recognition of defined benefit pension and post-retirement items:				
Recognition of actuarial losses, plan amendments, prior service cost, and settlement charge before taxes	$ 16,896	$ 24,529	$ 18,609	(b)
Provision for taxes	3,618	5,203	4,062	Provision for taxes
Total, net of taxes	$ 13,278	$ 19,326	$ 14,547	

(a) The cross currency swap reflects an unrealized gain of $2.7 million and $4.2 million and an unrealized loss of $13.8 million recorded in other charges (income) during the years ended December 31, 2022, 2021, and 2020, respectively, that was offset by the underlying unrealized gain or loss on the hedged debt. The cross currency swap also reflects a realized gain of $4.8 million, $1.4 million, and $2.3 million recorded in interest expense during the years ended December 31, 2022, 2021, and 2020, respectively.

(b) These accumulated other comprehensive income (loss) components are included in the computation of net periodic pension and post-retirement cost. See Note 13 for additional details.

12. *EQUITY INCENTIVE PLAN*

The Company's equity incentive plan provides employees and directors of the Company additional incentives to join and/or remain in the service of the Company as well as to maintain and enhance the long-term performance and profitability of the Company. The Company's 2013 Equity Incentive Plan was approved by shareholders on May 2, 2013 and provides that 2 million shares of common stock, plus any shares that remained available for grant under the Company's prior equity incentive plan as well as options outstanding that terminate without being exercised, may be the subject of awards. The plan provides for the grant of options, restricted stock units, and other equity-based awards. The exercise price of options granted shall not be less than the fair market value of the common stock on the date of the award. Options primarily vest equally over a five-year period from the date of grant and have a maximum term of up to 10 years. Restricted units primarily vest equally over a five-year period from the date of grant. Performance share units generally vest after a three-year period from the date of the grant based upon satisfaction of the performance condition. The compensation committee of the Board of Directors has generally granted restricted share units to participating managers and non-qualified stock options and performance share units to executive officers.

On May 6, 2021, the Company's shareholders approved the adoption of the Company's 2013 Equity Incentive Plan (Amended and Restated), with the effect that approximately 0.9 million additional shares of common stock were added to the 2.1 million shares that remained available under the plan prior to its amendment. In addition, shares subject to options granted under the Company's prior equity incentive plan that terminate or are forfeited without being exercised are also available for awards under the amended plan. The amended plan expires in 2031.

All share-based compensation arrangements granted to employees, including stock option grants, are recognized in the consolidated statement of operations based on the grant-date fair value of the award over the period during which an employee is required to provide service in exchange for the award. Share-based compensation expense is recorded within selling, general, and administrative in the consolidated statement of operations with a corresponding offset to additional paid-in capital in the consolidated balance sheet.

The fair values of stock options granted were calculated using the Black-Scholes pricing model. The aggregate intrinsic value of an option is the amount by which the fair value of the underlying stock exceeds its exercise price. The following table summarizes all stock option activity from December 31, 2021 through December 31, 2022:

	Number of Options	Weighted Average Exercise Price	Aggregate Intrinsic Value (in millions)
Outstanding at December 31, 2021	405,784	$ 512.30	$ 480.8
Granted	17,487	1,228.39	
Exercised	(114,641)	289.73	
Forfeited	(481)	1,027.67	
Outstanding at December 31, 2022	308,149	635.00	250.5
Options exercisable at December 31, 2022	239,129	$ 503.99	$ 225.3

The following table details the weighted average remaining contractual life of options outstanding at December 31, 2022 by range of exercise prices:

Number of Options Outstanding	Weighted Average Exercise Price	Remaining Contractual Life of Options Outstanding	Options Exercisable
140,457	$ 336.92	3.03	140,457
106,807	$ 664.31	5.95	84,718
60,885	$ 1,271.24	8.77	13,954
308,149		5.51	239,129

As of the date granted, the weighted average grant-date fair value of the options granted during the years ended December 31, 2022, 2021, and 2020 was $447.52, $377.89, and $284.25, respectively.

Such weighted average grant-date fair value was determined using the following assumptions:

	2022	2021	2020
Risk-free interest rate	4.35%	0.95%	0.34%
Expected life in years	6.4	6.3	6.0
Expected volatility	26%	25%	26%
Expected dividend yield	—	—	—

The total intrinsic value of options exercised during the years ended December 31, 2022, 2021, and 2020 was approximately $121.3 million, $116.0 million, and $84.5 million, respectively.

The compensation expense for options recognized during the years ended December 31, 2022 and 2021 was $7.8 million, and $7.7 million for the year ended December 31, 2020.

The following table summarizes all restricted stock unit and performance share unit activity from December 31, 2021 through December 31, 2022:

	Number of Restricted Stock Units	Aggregate Intrinsic Value (in millions)	Number of Performance Share Units	Aggregate Intrinsic Value (in millions)
Outstanding at December 31, 2021	26,899	$45.6	14,844	$25.2
Granted	8,862		2,350	
Adjustment for performance results achieved(1)	—		4,455	
Vested	(9,551)		(9,367)	
Forfeited	(1,318)		—	
Outstanding at December 31, 2022	24,892	$36.0	12,282	$17.8

(1) 2018 performance share units vested in the first quarter 2022.

The weighted average grant-date fair value of the restricted stock units granted during the years ended 2022, 2021, and 2020 was $1,230.18, $1,445.37, and $1,104.02 per unit, respectively, which primarily vest ratably over a five-year period. The total fair value of the restricted stock units on the date of grant was $10.8 million for 2022, $11.4 million for 2021, and $9.1 million for 2020 and will be recorded as compensation expense on a straight-line basis over the vesting period. The total fair value of restricted stock units vested during the years ended December 31, 2022, 2021, and 2020 was approximately $8.2 million, $11.4 million, and $7.7 million, respectively. Approximately $7.9 million, $7.6 million, and $7.9 million of compensation expense was recognized during the years ended December 31, 2022, 2021, and 2020, respectively.

The Company granted performance share units with a market condition during 2022, 2021, and 2020. Grantees of performance share units will be eligible to receive shares of the Company's common stock depending upon the Company's total shareholder return relative to the performance of companies in the S&P 500 Health Care and S&P 500 Industrials over a three-year period. The awards actually earned will range from zero to 200% of the targeted number of performance share units for the three-year performance period and will be paid, to the extent earned, in the fiscal quarter following the end of the applicable three-year performance period. During 2022, the market conditions for the 2019 performance share units were met and will vest in the first quarter 2023 with a payout of 200%. Performance share unit awards were valued using a Monte Carlo simulation based on the following assumptions:

	2022	2021	2020
Risk-free interest rate	4.58%	0.61%	0.18%
Expected life in years	3	3	3
Expected volatility	26%	25%	26%
Expected dividend yield	—	—	—

As of the date granted, the fair value of the performance share units granted was $1,357.26 for 2022, $1,447.75 for 2021, and $1,345.03 for 2020. The total fair value of the performance share units on the date of the grant was $3.2 million, $4.0 million and $3.6 million for 2022, 2021 and 2020, respectively, and will be recorded as compensation expense on a straight-line basis over the three-year performance period.

The compensation expense for performance share units recognized during the years ended December 31, 2022, 2021, and 2020 was $4.0 million, $4.2 million, and $3.1 million, respectively.

At December 31, 2022, a total of 3,858,825 shares of common stock were available for grant in the form of stock options, restricted stock units, or performance share units.

As of December 31, 2022, the unrecorded deferred share-based compensation balance related to stock options, restricted stock units, and performance share units was $52.9 million and will be recognized using a straight-line method over an estimated weighted average amortization period of 2.3 years.

13. *BENEFIT PLANS*

The Company maintains a number of retirement and other post-retirement employee benefit plans.

Certain subsidiaries sponsor defined contribution plans. Benefits are determined and funded annually based upon the terms of the plans. Amounts recognized as cost under these plans amounted to $22.9 million, $24.8 million, and $19.3 million for the years ended December 31, 2022, 2021, and 2020, respectively.

Certain subsidiaries sponsor defined benefit plans. Benefits are provided to employees primarily based upon years of service and employees' compensation for certain periods during the last years of employment. Prior to 2002, the Company's U.S. operations also provided post-retirement medical benefits to their employees. Contributions for medical benefits are related to employee years of service.

(In thousands, except share data, unless otherwise stated)

The following tables set forth the change in benefit obligation, the change in plan assets, the funded status, and amounts recognized in the consolidated financial statements for the Company's defined benefit plans and post-retirement plan at December 31, 2022 and 2021:

	U.S. Pension Benefits		Non-U.S. Pension Benefits		Other Benefits		Total	
	2022	2021	2022	2021	2022	2021	2022	2021
Change in benefit obligation:								
Benefit obligation at beginning of year	$141,906	$149,947	$1,027,333	$1,091,811	$ 875	$ 1,030	$1,170,114	$1,242,788
Service cost, gross	1,665	1,498	36,640	35,675	—	—	38,305	37,173
Interest cost	2,696	2,194	5,927	3,347	12	8	8,635	5,549
Actuarial losses (gains)	(27,541)	(3,399)	(219,304)	1,904	206	37	(246,639)	(1,458)
Plan amendments and other	—	—	13	(23,196)	—	—	13	(23,196)
Benefits paid	(8,433)	(8,334)	(34,949)	(39,911)	(423)	(200)	(43,805)	(48,445)
Impact of foreign currency	—	—	(30,365)	(42,297)	—	—	(30,365)	(42,297)
Benefit obligation at end of year	$110,293	$141,906	$ 785,295	$1,027,333	$ 670	$ 875	$ 896,258	$1,170,114
Change in plan assets:								
Fair value of plan assets at beginning of year	$113,523	$109,462	$1,008,261	$ 984,322	$ —	$ —	$1,121,784	$1,093,784
Actual return on plan assets	(17,863)	12,307	(96,866)	52,922	—	—	(114,729)	65,229
Employer contributions	114	88	24,441	27,088	423	200	24,978	27,376
Plan participants' contributions	—	—	17,600	16,102	—	—	17,600	16,102
Benefits paid	(8,433)	(8,334)	(34,949)	(39,911)	(423)	(200)	(43,805)	(48,445)
Impact of foreign currency	—	—	(23,622)	(32,262)	—	—	(23,622)	(32,262)
Fair value of plan assets at end of year	$ 87,341	$113,523	$ 894,865	$1,008,261	$ —	$ —	$ 982,206	$1,121,784
Funded status	$ (22,952)	$ (28,383)	$ 109,570	$ (19,072)	$ (670)	$ (875)	$ 85,948	$ (48,330)

(In thousands, except share data, unless otherwise stated)

The change in the benefit obligation for 2022 is primarily related to an increase of the discount rates.

The accumulated benefit obligations at December 31, 2022 and 2021 were $110.3 million and $141.9 million, respectively, for the U.S. defined benefit pension plan and $665.1 million and $867.0 million, respectively, for all non-U.S. plans. Certain of the plans included within non-U.S. pension benefits have accumulated benefit obligations which exceed the fair value of plan assets. The projected benefit obligation, the accumulated benefit obligation, and fair value of assets of these plans as of December 31, 2022 were $121.6 million, $111.7 million, and $26.9 million, respectively. The projected benefit obligation, the accumulated benefit obligation, and fair value of assets of these plans as of December 31, 2021 were $181.3 million, $174.1 million, and $40.3 million, respectively.

Amounts recognized in the consolidated balance sheets consist of:

	U.S. Pension Benefits		Non-U.S. Pension Benefits		Other Benefits		Total	
	2022	2021	2022	2021	2022	2021	2022	2021
Other non-current assets	$ —	$ —	$202,368	$122,049	$ —	$ —	$202,368	$122,049
Accrued and other liabilities	(131)	(136)	(4,986)	(5,289)	(115)	(129)	(5,232)	(5,554)
Pension and other post-retirement liabilities	(22,821)	(28,246)	(90,342)	(135,833)	(555)	(746)	(113,718)	(164,825)
Accumulated other comprehensive loss (income)	50,822	56,648	151,924	259,714	(430)	(742)	202,316	315,620
Total	$ 27,870	$ 28,266	$258,964	$240,641	$ (1,100)	$ (1,617)	$285,734	$267,290

The following amounts have been recognized in accumulated other comprehensive income (loss), before taxes, at December 31, 2022 and have not yet been recognized as a component of net periodic pension cost:

	U.S. Pension Benefits		Non-U.S. Pension Benefits		Other Benefits		Total		Total, After Tax	
	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021
Plan amendments and prior service cost	$ —	$ —	$ (24,701)	$ (29,446)	$ (351)	$ (426)	$ (25,052)	$ (29,872)	$ (20,237)	$ (24,118)
Actuarial losses (gains)	50,822	56,648	176,625	289,160	(79)	(316)	227,368	345,492	180,278	$272,118
Total	$ 50,822	$ 56,648	$ 151,924	$ 259,714	$ (430)	$ (742)	$ 202,316	$ 315,620	$ 160,041	$248,000

The following changes in plan assets and benefit obligations were recognized in other comprehensive income (loss), before taxes, for the year ended December 31, 2022:

	U.S. Pension Benefits	Non-U.S. Pension Benefits	Other Benefits	Total	Total, After Tax
Net actuarial losses (gains)	$ (3,489)	$ (86,130)	$ 206	$ (89,413)	$ (70,672)
Plan amendment	—	13	—	13	9
Amortization of:					
Actuarial (losses) gains	(2,337)	(18,896)	31	(21,202)	(16,777)
Plan amendments and prior service cost	—	4,231	75	4,306	3,499
Impact of foreign currency	—	(7,008)	—	(7,008)	(3,094)
Total	$ (5,826)	$ (107,790)	$ 312	$ (113,304)	$ (87,035)

(In thousands, except share data, unless otherwise stated)

The assumed discount rates and rates of increase in future compensation levels used in calculating the projected benefit obligations vary according to the economic conditions of the country in which the retirement plans are situated. The weighted average rates used for the purposes of the Company's plans are as follows:

	U.S.		Non-U.S.	
	2022	2021	2022	2021
Discount rate	4.87%	2.57%	2.57%	0.40%
Compensation increase rate	n/a	n/a	0.87%	0.85%
Expected long-term rate of return on plan assets	6.75%	5.75%	3.84%	3.78%
Interest crediting rate	n/a	n/a	1.50%	1.00%

The assumed discount rates, rates of increase in future compensation levels, and the long-term rate of return used in calculating the net periodic pension cost vary according to the economic conditions of the country in which the retirement plans are situated. The weighted average rates used for the purposes of the Company's plans are as follows:

	U.S.			Non-U.S.		
	2022	2021	2020	2022	2021	2020
Discount rate	2.57%	2.22%	3.03%	0.40%	0.63%	0.51%
Compensation increase rate	n/a	n/a	n/a	0.85%	0.85%	0.86%
Expected long-term rate of return on plan assets	5.75%	5.75%	6.25%	3.78%	3.78%	3.76%

Net periodic pension cost and net periodic post-retirement benefit for the defined benefit plans and U.S. post-retirement plan include the following components for the years ended December 31:

	U.S.			Non-U.S.			Other Benefits			Total		
	2022	2021	2020	2022	2021	2020	2022	2021	2020	2022	2021	2020
Service cost, net	$1,665	$1,498	$ 1,304	$ 19,040	$ 19,558	$ 18,314	$ —	$ —	$ —	$ 20,705	$ 21,056	$ 19,618
Interest cost on projected benefit obligations	2,696	2,194	3,556	5,927	3,347	4,778	12	8	25	8,635	5,549	8,359
Expected return on plan assets	(6,189)	(5,974)	(6,094)	(36,308)	(35,511)	(33,067)	—	—	—	(42,497)	(41,485)	(39,161)
Recognition of actuarial losses/(gains) and prior service cost	2,337	2,916	2,578	14,665	21,725	16,134	(106)	(112)	(103)	16,896	24,529	18,609
Net periodic pension cost/(benefit)	$ 509	$ 634	$ 1,344	$ 3,324	$ 9,119	$ 6,159	$ (94)	$ (104)	$ (78)	$ 3,739	$ 9,649	$ 7,425

The projected post-retirement benefit obligation was principally determined using discount rates of 4.67% in 2022 and 1.94% in 2021. Net periodic post-retirement benefit cost was principally determined using discount rates of 1.94% in 2022, 1.47% in 2021, and 2.54% in 2020. The health care cost trend rate was 5.7% in 2022, 5.9% in 2021, and 6.0% in 2020, decreasing to 4.50% in 2029.

The Company's overall asset investment strategy is to achieve long-term growth while minimizing volatility by widely diversifying among asset types and strategies. Target asset allocations and investment return criteria are established by the pension committee or designated officers of each plan. Target asset allocation ranges for the U.S. pension plan include 40-60% in equity securities, 23-33% in fixed income securities, and 15-25% in other types of investments. International plan assets relate primarily to the Company's Swiss plan with target allocations of 24-45% in equities, 35-55% in fixed income securities, and 15-25% in other types of investments. Actual results are monitored against targets and the trustees are required to report to the members of each plan, including an analysis of investment performance on an annual basis at a minimum. Day-to-day asset management is typically performed by third-party asset managers, reporting to the pension committees or designated officers.

(In thousands, except share data, unless otherwise stated)

The long-term rate of return on plan asset assumptions used to determine pension expense under U.S. GAAP is generally based on estimated future returns for the target investment mix determined by the trustees as well as historical investment performance.

The following table presents the fair value measurement of the Company's plan assets by hierarchy level:

	December 31, 2022				December 31, 2021			
	Quoted Prices in Active Markets for Identical Assets (Level 1)	Observable Inputs for Identical Assets (Level 2)	Unobservable Inputs (Level 3)	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Observable Inputs for Identical Assets (Level 2)	Unobservable Inputs (Level 3)	Total
Asset Category:								
Cash and Cash Equivalents	$ 99,535	$ —	$ —	$ 99,535	$ 92,207	$ —	$ —	$ 92,207
Equity Securities:								
Mettler-Toledo Stock	3,107	—	—	3,107	3,639	—	—	3,639
Equity Mutual Funds:								
U.S.(1)	5,753	24,133	—	29,886	8,197	43,287	—	51,484
International(2)	89,247	9,496	—	98,743	100,197	23,022	—	123,219
Emerging Markets(3)	127,506	—	—	127,506	157,814	3,315	—	161,129
Fixed Income Securities:								
Corporate/Government Bonds(4)	79,221	—	—	79,221	87,772	—	—	87,772
Fixed Income Mutual Funds:								
Insurance Contracts(5)	—	25,126	1,775	26,901	—	38,555	1,787	40,342
Core Bond(6)	73,315	62,956	—	136,271	107,394	71,608	—	179,002
Real Asset Mutual Funds:								
Real Estate(7)	—	167,693	—	167,693	—	153,954	—	153,954
Commodities(8)	49,603	—	—	49,603	50,525	—	—	50,525
Other Types of Investments:								
Debt Securities (9)	41,099	—	—	41,099	41,628	—	—	41,628
Global Allocation Funds(10)	4,370	—	—	4,370	5,680	—	—	5,680
Multi-Strategy Fund of Hedge Funds (11)	—	17,702	—	17,702	—	16,103	—	16,103
Insurance Linked Securities(12)	13,243	—	—	13,243	19,287	—	—	19,287
Total assets in fair value hierarchy	$ 585,999	$ 307,106	$ 1,775	$ 894,880	$ 674,340	$ 349,844	$ 1,787	$1,025,971
Investments measured at net asset value:								
International(13)				2,409				3,568
Emerging Markets (13)				5,980				7,211
Multi-Strategy Fund of Hedge Funds (13)				78,937				85,034
Total pension assets at fair value				$ 982,206				$1,121,784

____

(1) Represents primarily large capitalization equity mutual funds tracking the S&P 500 Index.

(2) Represents all capitalization core and value equity mutual funds located primarily in Switzerland, the United Kingdom, and Canada.

(3) Represents core and growth mutual funds and funds of mutual funds invested in emerging markets primarily in Eastern Europe, Latin America, and Asia.

(4) Represents investments in high-grade corporate and government bonds located in Switzerland and the European Union.

(5) Represents fixed and variable rate annuity contracts provided by insurance companies.

(6) Represents fixed income mutual funds invested in the U.S., the United Kingdom, Switzerland, and European government bonds, high-grade corporate bonds, mortgage-backed securities, and collateralized mortgage obligations.

(7) Represents mutual funds invested in real estate located primarily in Switzerland.

(8) Represents commodity funds invested across a broad range of sectors.

(In thousands, except share data, unless otherwise stated)

(9) Represents a loan to a wholly owned subsidiary of the Company. See Note 10 for additional disclosure.
(10) Represents mutual funds invested globally in both equities and fixed income securities.
(11) Represents currency hedged versions of the non-currency hedged equity funds held in the United Kingdom.
(12) Represents a broadly diversified portfolio of assets that carry exposure to insurance risks, particularly insurance linked securities.
(13) Investments that are measured using the net asset value (NAV) per share practical expedient have not been categorized in the fair value hierarchy. The amounts presented above are intended to permit reconciliation of the fair value hierarchy to the fair value of total plan assets in order to determine the amounts included in the consolidated balance sheet.

The fair values of the Company's stock and corporate and government bonds are valued at the year-end closing price as reported on the securities exchange on which they are traded. Mutual funds are valued at the exchange-listed year-end closing price or at the net asset value of shares held by the fund at the end of the year. Insurance contracts are valued by discounting the related cash flows using a current year-end market rate or at cash surrender value, which is presumed to equal fair value. Funds of hedge funds are valued at the net asset value of shares held by the fund at the end of the year.

The following table presents a roll-forward of activity for the years ended December 31, 2022 and 2021 for Level 3 asset categories:

	Insurance Contracts
Balance at December 31, 2020	$ 1,793
Actual return on plan assets related to assets held at end of year	26
Purchases	70
Impact of foreign currency	(102)
Balance at December 31, 2021	$ 1,787
Actual return on plan assets related to assets held at end of year	(1)
Purchases	80
Impact of foreign currency	(91)
Balance at December 31, 2022	$ 1,775

There were no transfers between any asset levels during the years ended December 31, 2022 and 2021.

The following benefit payments, which reflect expected future service as appropriate, are expected to be paid:

	U.S. Pension Benefits	Non-U.S. Pension Benefits	Other Benefits, Net of Subsidy	Total
2023	$ 8,737	$ 48,449	$ 115	$ 57,301
2024	8,777	51,196	102	60,075
2025	8,804	51,332	90	60,226
2026	8,768	49,982	79	58,829
2027	8,712	52,391	70	61,173
2028-2032	41,633	257,800	235	299,668

In 2023, the Company expects to make employer pension contributions of approximately $27.5 million to its non-U.S. pension plan and employer contributions of approximately $0.1 million to its U.S. post-retirement medical plan.

14. *TAXES*

(In thousands, except share data, unless otherwise stated)

The sources of the Company's earnings before taxes were as follows for the years ended December 31:

	2022	2021	2020
United States	$ 144,107	$ 109,918	$ 94,651
Non-United States	926,485	839,443	654,092
Earnings before taxes	$ 1,070,592	$ 949,361	$ 748,743

The provision for taxes consists of:

	Current	Deferred	Total
Year ended December 31, 2022:			
United States federal	$ 363	$ 9,710	$ 10,073
United States state and local	4,893	1,282	6,175
Non-United States	166,317	15,525	181,842
Total	$ 171,573	$ 26,517	$ 198,090
Year ended December 31, 2021:			
United States federal	$ 7,750	$ (7,415)	$ 335
United States state and local	3,670	(1,099)	2,571
Non-United States	168,393	9,077	177,470
Total	$ 179,813	$ 563	$ 180,376
Year ended December 31, 2020:			
United States federal	$ 6,242	$ (6,311)	$ (69)
United States state and local	5,563	(1,736)	3,827
Non-United States	146,983	(4,737)	142,246
Total	$ 158,788	$ (12,784)	$ 146,004

(In thousands, except share data, unless otherwise stated)

The provision for tax expense differed from the amounts computed by applying the United States federal income tax rate of 21% for the years ended December 31, 2022, 2021, and 2020 to earnings before taxes as a result of the following:

	2022	2021	2020
Expected tax	$ 224,825	$ 199,365	$ 157,236
United States state and local income taxes, net of federal income tax benefit	5,132	1,235	3,320
Non-United States income taxes at other than U.S. federal rate	(3,055)	3,439	179
Excess tax benefits from stock option exercises	(22,965)	(22,843)	(17,261)
Other, net	(5,847)	(820)	2,530
Total provision for taxes	$ 198,090	$ 180,376	$ 146,004

The Company's reported effective tax rate was 18.5% in 2022, 19.0% in 2021, and 19.5% in 2020.

The tax effects of temporary differences that give rise to significant portions of the deferred tax assets and deferred tax liabilities are presented below at December 31:

	2022	2021
Deferred tax assets:		
Inventory	$ 26,401	$ 24,007
Lease liability, accrued and other liabilities	91,892	103,900
Accrued post-retirement benefit and pension costs	33,010	49,774
Net operating loss and other tax carryforwards	37,797	26,808
Swiss tax reform intangible assets	49,642	51,194
Other	4,927	1,006
Total deferred tax assets	243,669	256,689
Less valuation allowance	(62,615)	(51,126)
Total deferred tax assets less valuation allowance	181,054	205,563
Deferred tax liabilities:		
Inventory	8,053	6,905
Lease right-of-use assets and other assets	28,297	31,164
Property, plant, and equipment	76,867	68,701
Acquired intangibles amortization	61,278	61,289
Prepaid post-retirement benefit and pension costs	52,197	41,524
International earnings	27,357	15,001
Unrealized currency gains	11,285	3,713
Total deferred tax liabilities	265,334	228,297
Net deferred tax (liability) asset	$ (84,280)	$ (22,734)

The Company continues to record valuation allowances related to certain of its deferred income tax assets due to the uncertainty of the ultimate realization of future benefits from such assets. The potential decrease or increase of the valuation allowance in the near term is dependent on the future ability of the Company to realize the deferred tax assets that are affected by the future profitability of operations in the respective/relevant jurisdictions.

(In thousands, except share data, unless otherwise stated)

A reconciliation of the beginning and ending amounts of unrecognized tax benefits is as follows:

	2022	2021
Unrecognized tax benefits at beginning of year	$ 46,432	$ 38,294
Increases related to current tax positions	12,942	12,200
Decreases related to prior year tax positions	(7,245)	(2,905)
Impact of foreign currency	(1,307)	(1,157)
Unrecognized tax benefits at end of year	$ 50,822	$ 46,432

Included in the balance of unrecognized tax benefits at December 31, 2022 and 2021 were $50.8 million and $46.4 million, respectively, of tax benefits that if recognized would reduce the Company's effective tax rate. Increases and decreases related to current and prior year tax positions during 2022 and 2021 primarily related to non-United States income taxes. The Company recognizes accrued amounts of interest and penalties related to its uncertain tax positions as part of its income tax expense within its consolidated statement of operations. The amount of accrued interest and penalties included within other non-current liabilities within the Company's consolidated balance sheet as of December 31, 2022 and 2021 was $9.3 million and $7.7 million, respectively.

The Company believes that it is reasonably possible that the unrecognized tax benefit balance could change over the next 12 months, primarily related to potential disputes raised by the taxing authorities over income and expense recognition. The Company does not expect a change would have a material impact on its financial position, results of operations, or cash flows.

The Company plans to repatriate earnings from China, Switzerland, Germany, the United Kingdom, and certain other countries in future years and believes that there will be no additional tax costs associated with the repatriation of such foreign earnings other than non-U.S. withholding taxes, certain state taxes, and U.S. taxes on currency gains, if any, for which a deferred tax liability has been recognized. All other undistributed earnings and any additional outside basis difference inherent in these entities and the contributed capital of our foreign subsidiaries are considered to be permanently reinvested on which no U.S. deferred income taxes or foreign withholding taxes have been provided. It is not practicable to estimate the amount of deferred tax liability related to these undistributed earnings and additional outside basis differences in these entities due to the complexity of the calculation and the uncertainty regarding assumptions necessary to compute the tax.

As of December 31, 2022, the major jurisdictions for which the Company is subject to examinations are: Germany for years after 2015; the United States after 2018; France after 2019; Switzerland after 2019; the United Kingdom after 2020; and China after 2018. Additionally, the Company is currently under examination in various taxing jurisdictions in which it conducts business operations. While the Company has not yet received any material assessments from these taxing authorities, the Company believes that adequate amounts of taxes and related interest and penalties have been provided for any adverse adjustments as a result of these examinations and that the ultimate outcome of these examinations will not result in a material impact on the Company's consolidated results of operations or financial position.

(In thousands, except share data, unless otherwise stated)

15. OTHER CHARGES (INCOME), NET

Other charges (income), net consisted of net other income of $9.3 million, $3.1 million, and $13.8 million in 2022, 2021, and 2020, respectively. Other charges (income), net includes non-service pension costs (benefits), net (gains) losses from foreign currency transactions and hedging activities, interest income, and other items. Non-service pension benefits were $16.9 million, $11.4 million, and $12.2 million in 2022, 2021, and 2020, respectively. Other charges (income), net also includes $0.9 million for the year ended December 31, 2022 of acquisition costs. For the year ended December 31, 2021 $3.4 million of acquisition costs, as well as a $6.8 million charge to increase the PendoTECH acquisition contingent consideration and related obligations to the sellers were included in other charges (income), net.

16. LEASES

The Company's operating leases primarily comprise real estate and vehicles. Real estate leases are largely related to sales and marketing, service, and administrative offices, while vehicle leases are primarily related to the Company's field sales and service organization. The consolidated balance sheet included the following balances as of December 31:

	2022	2021	Balance Sheet Location
Right-of-use assets, net	$114,321	$118,499	Other non-current assets
Current lease liability	$ 29,271	$ 30,636	Accrued and other liabilities
Non-current lease liability	86,888	88,316	Other non-current liabilities
Total operating lease liability	$116,159	$118,952	

As of December 31, 2022, the Company has not entered into any material real estate operating leases expected to commence in 2023.

For the years ended December 31, 2022, 2021 and 2020, the Company had the following recorded in selling, general, and administrative associated with leasing arrangements:

	2022	2021	2020
Operating lease expense	$ 37,145	$ 36,137	$ 34,559
Variable lease expense	4,649	4,503	4,182
Short-term lease expense	958	1,018	991
Total lease expense	$ 42,752	$ 41,658	$ 39,732
Weighted average remaining lease term	7.9 years	7.4 years	6.8 years
Weighted average discount rate	2.9%	2.1%	2.5%

Accruals and other on the consolidated statement of cash flows includes the amortization of the lease right-of-use asset of $34.6 million, $33.7 million, and $32.1 million, offset by a change in the lease liability of $34.6 million, $33.7 million, and $31.7 million for the years ended December 31, 2022, 2021, and 2020, respectively. Lease payments within operating activities were $35.2 million, $35.5 million, and $36.0 million for the years ended December 31, 2022, 2021, and 2020, respectively. The Company also obtained non-cash lease right-of-use assets in exchange for lease liabilities of $27.0 million, $46.4 million, and $35.0 million for the years ended December 31, 2022, 2021, and 2020, respectively.

(In thousands, except share data, unless otherwise stated)

The following is a maturity analysis of the annual undiscounted cash flows for the annual periods ended December 31:

2023	$ 32,027
2024	22,386
2025	14,824
2026	11,117
2027	7,490
Thereafter	41,123
Total lease payments	128,967
Less imputed interest	(12,808)
Total operating lease liability	$ 116,159

17. COMMITMENTS AND CONTINGENCIES

Legal

The Company is party to various legal proceedings, including certain environmental matters, incidental to the normal course of business. Management does not expect that any of such proceedings will have a material adverse effect on the Company's financial condition, results of operations, or cash flows.

18. SEGMENT REPORTING

The Company has five reportable segments: U.S. Operations, Swiss Operations, Western European Operations, Chinese Operations, and Other. U.S. Operations represent certain of the Company's marketing and producing organizations located in the United States. Western European Operations include the Company's marketing and producing organizations in Western Europe, excluding operations located in Switzerland. Swiss Operations include marketing and producing organizations located in Switzerland as well as extensive R&D operations that are responsible for the development, production, and marketing of precision instruments, including weighing, analytical, and measurement technologies for use in a variety of laboratory and industrial applications. Chinese Operations represent the Company's marketing and producing organizations located in China. The Company's market organizations are geographically focused and are responsible for all aspects of the Company's sales and service. Operations that exist outside these reportable segments are included in Other.

The accounting policies of the operating segments are the same as those described in the summary of significant accounting policies. The Company evaluates performance based on segment profit for segment reporting (gross profit less research and development and selling, general, and administrative expenses, before amortization, interest expense, restructuring charges, other charges (income), net, and taxes). Inter-segment sales and transfers are priced to reflect consideration of market conditions and the regulations of the countries in which the transferring entities are located.

(In thousands, except share data, unless otherwise stated)

The following tables show the operations of the Company's reportable segments:

For the Year Ended December 31, 2022	Net Sales to External Customers	Net Sales to Other Segments	Total Net Sales	Segment Profit	Depreciation	Total Assets	Purchase of Property, Plant, and Equipment	Goodwill
U.S. Operations	$ 1,444,460	$ 156,884	$ 1,601,344	$ 357,802	$ 14,582	$ 3,574,842	$ (55,464)	$ 524,470
Swiss Operations	176,119	839,951	1,016,070	309,844	6,644	2,968,539	(7,690)	25,058
Western European Operations	799,931	196,900	996,831	174,352	4,970	1,314,332	(5,110)	96,077
Chinese Operations	841,526	308,164	1,149,690	424,162	9,699	1,234,303	(12,418)	641
Other[(a)]	657,673	3,959	661,632	90,322	4,176	388,639	(6,268)	13,924
Eliminations and Corporate[(b)]	—	(1,505,858)	(1,505,858)	(164,023)	6,713	(5,988,260)	(34,291)	—
Total	$ 3,919,709	$ —	$ 3,919,709	$ 1,192,459	$ 46,784	$ 3,492,395	$ (121,241)	$ 660,170

For the Year Ended December 31, 2021	Net Sales to External Customers	Net Sales to Other Segments	Total Net Sales	Segment Profit	Depreciation	Total Assets	Purchase of Property, Plant, and Equipment	Goodwill
U.S. Operations	$ 1,287,983	$ 155,987	$ 1,443,970	$ 302,177	$ 12,123	$ 3,278,400	$ (34,972)	$ 508,942
Swiss Operations	171,633	826,001	997,634	301,142	6,557	2,700,965	(7,856)	23,710
Western European Operations	829,761	211,547	1,041,308	172,265	5,264	1,566,819	(11,014)	100,433
Chinese Operations	771,651	291,779	1,063,430	369,835	9,566	1,037,838	(15,700)	710
Other[(a)]	656,902	4,780	661,682	100,028	3,819	365,182	(5,652)	14,827
Eliminations and Corporate[(b)]	—	(1,490,094)	(1,490,094)	(187,636)	7,653	(5,622,406)	(32,386)	—
Total	$ 3,717,930	$ —	$ 3,717,930	$ 1,057,811	$ 44,982	$ 3,326,798	$ (107,580)	$ 648,622

For the Year Ended December 31, 2020	Net Sales to External Customers	Net Sales to Other Segments	Total Net Sales	Segment Profit	Depreciation	Total Assets	Purchase of Property, Plant, and Equipment	Goodwill
U.S. Operations	$ 1,072,319	$ 121,850	$ 1,194,169	$ 244,940	$ 11,347	$ 2,560,652	$ (18,258)	$ 415,869
Swiss Operations	143,923	679,837	823,760	245,465	6,257	2,028,879	(5,495)	24,525
Western European Operations	716,715	173,176	889,891	147,562	4,769	1,294,579	(13,678)	93,514
Chinese Operations	578,610	213,735	792,345	270,497	8,506	985,977	(9,755)	686
Other[(a)]	573,610	4,600	578,210	77,910	3,737	340,786	(5,974)	15,676
Eliminations and Corporate[(b)]	—	(1,193,198)	(1,193,198)	(145,666)	7,428	(4,396,324)	(39,334)	—
Total	$ 3,085,177	$ —	$ 3,085,177	$ 840,708	$ 42,044	$ 2,814,549	$ (92,494)	$ 550,270

(a) *Other includes reporting units in Southeast Asia, Latin America, Eastern Europe, and other countries.*

(b) *Eliminations and Corporate includes the elimination of intersegment transactions as well as certain corporate expenses and intercompany investments, which are not included in the Company's operating segments.*

A reconciliation of earnings before taxes to segment profit follows:

	2022	2021	2020
Earnings before taxes	$ 1,070,592	$ 949,361	$ 748,743
Amortization	66,239	63,075	56,665
Interest expense	55,392	43,242	38,616
Restructuring charges	9,556	5,239	10,516
Other income, net	(9,320)	(3,106)	(13,832)
Segment profit	$ 1,192,459	$ 1,057,811	$ 840,708

(In thousands, except share data, unless otherwise stated)

The Company sells precision instruments, including weighing instruments and certain analytical and measurement technologies, and related services to a variety of customers and industries. None of these end-customers account for more than 1% of net sales. Service revenues are primarily derived from repair and other services including regulatory compliance qualification, calibration, certification, and preventative maintenance, and spare parts. A breakdown of the Company's sales by product category is disclosed in Note 3 to the consolidated financial statements.

In certain circumstances, our reporting units sell directly into other geographies. A breakdown of net sales to external customers by geographic customer destination and property, plant, and equipment by geographic destination for the years ended December 31 follows:

	Net Sales			Property, Plant, and Equipment, Net	
	2022	2021	2020	2022	2021
United States	$ 1,363,335	$ 1,217,114	$ 1,014,180	$ 228,997	$ 228,010
Other Americas	219,158	202,718	166,446	4,155	3,267
Total Americas	1,582,493	1,419,832	1,180,626	233,152	231,277
Germany	219,813	229,341	199,499	39,159	40,854
France	147,430	152,225	134,542	8,027	8,026
United Kingdom	85,382	90,431	70,163	30,828	35,349
Switzerland	80,891	82,381	69,965	300,155	304,228
Other Europe	480,844	508,583	447,097	35,914	51,760
Total Europe	1,014,360	1,062,961	921,266	414,083	440,217
China	823,842	754,002	565,100	90,343	95,356
Rest of World	499,014	481,135	418,185	41,022	32,515
Total Asia/Rest of World	1,322,856	1,235,137	983,285	131,365	127,871
Total	$ 3,919,709	$ 3,717,930	$ 3,085,177	$ 778,600	$ 799,365

Schedule II — Valuation and Qualifying Accounts (in thousands)

Column A	Column B	Column C		Column D	Column E
		Additions			
		(1)	(2)		
Description	Balance at the Beginning of Period	Charged to Costs and Expenses	Charged to Other Accounts	-Deductions-	Balance at End of Period
			Note (A)	Note (B)	
Deferred tax valuation allowance:					
Year ended December 31, 2022	$ 51,126	$ 6,103	$ 6,284	$ 898	$ 62,615
Year ended December 31, 2021	$ 52,388	$ 2,058	$ —	$ 3,320	$ 51,126
Year ended December 31, 2020	$ 50,853	$ 2,824	$ 3,009	$ 4,298	$ 52,388

Note (A)

Amounts in 2022 primarily relate to disallowed interest expense deductions. Amounts in 2020 relate primarily to changes in currency translation adjustments.

Note (B)

Amounts in 2022 relate primarily to changes in foreign currency. The amounts in 2021 and 2020 include decreases in state net operating losses and credits, foreign tax credit, and R&D credit carryforwards.

EXHIBIT 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-258294, 333-190181, 333-118260, 333-104083, and 333-31636) of Mettler-Toledo International Inc. of our report dated February 10, 2023 relating to the financial statements, financial statement schedule and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP

Columbus, Ohio
February 10, 2023

EXHIBIT 31.1

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

I, Patrick Kaltenbach, certify that:

1. I have reviewed this annual report on Form 10-K of Mettler-Toledo International 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 officers 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 officers 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.

/s/ Patrick Kaltenbach

Patrick Kaltenbach
Chief Executive Officer

Date: February 10, 2023

EXHIBIT 31.2

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

I, Shawn P. Vadala, certify that:

1. I have reviewed this annual report on Form 10-K of Mettler-Toledo International 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 officers 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 officers 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.

/s/ Shawn P. Vadala

Shawn P. Vadala
Chief Financial Officer

Date: February 10, 2023

EXHIBIT 32

CERTIFICATION PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of Section 1350, Chapter 63 of Title 18, United States Code), each of the undersigned officers of Mettler-Toledo International Inc. (the "Company") does hereby certify, to such officer's knowledge, that:

This annual report on Form 10-K for the period ending December 31, 2022 fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934 and the information contained in this report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ Patrick Kaltenbach

Patrick Kaltenbach
Chief Executive Officer

/s/ Shawn P. Vadala

Shawn P. Vadala
Chief Financial Officer

Date: February 10, 2023

Corporate Information

Corporate Offices
Mettler-Toledo International Inc.
1900 Polaris Parkway
Columbus, Ohio 43240-4035
Phone 614-438-4511

Im Langacher 44
CH-8606 Greifensee, Switzerland
Phone +41-44-944 22 11

www.mt.com

Transfer Agent and Registrar
Computershare Trust Company N.A. acts as primary Transfer Agent and Registrar for the Company. Questions should be sent to:

Computershare
P.O. Box 505000
Louisville, KY 40233
Phone 866-322-7862
www-us.computershare.com/investor

Annual Meeting
The annual meeting of shareholders will be held at 8 a.m. on Thursday, May 4, 2023. A notice of the meeting, together with a form of proxy and a proxy statement, will be mailed to shareholders on or about March 15, 2023.

Investor Relations
Direct requests for information to:

Adam Uhlman
Investor Relations
1900 Polaris Parkway
Columbus, Ohio 43240-4035
Phone +1 614-438-4794
adam.uhlman@mt.com

Officers

Patrick Kaltenbach
President and
Chief Executive Officer

Marc de La Guéronnière
Europe and North America

Jonas Greutert
Product Inspection

Stefan Heiniger
Laboratory

Gerry Keller
Process Analytics

Christian Magloth
Human Resources

Elena Markwalder
Industrial

Michelle Roe
General Counsel

Shawn P. Vadala
Chief Financial Officer

Oliver Wittorf
Supply Chain and IT

Richard Wong
Asia / Pacific

Board of Directors

Robert F. Spoerry
Chair of the Board
Director since 1996

Wah-Hui Chu*
Retired Non-Executive Chair – Asia,
PepsiCo International
Director since 2007

Roland Diggelmann
Former CEO,
Smith & Nephew plc
Director since 2022

Domitille Doat-Le Bigot
Chief Digital Officer,
Eurazeo
Director since 2020

Olivier A. Filliol*
Former President and Chief Executive Officer,
Mettler-Toledo International Inc.
Director since 2009

Elisha W. Finney
Retired CFO,
Varian Medical Systems Inc.
Director since 2017

Richard Francis
Chief Executive Officer,
Teva Pharmaceutical Industries Ltd.
Director since 2016

Michael A. Kelly
Retired Executive Vice President –
Electronics and Energy,
3M Company
Director since 2008

Thomas P. Salice
Co-Founder and Managing Member,
SFW Capital Partners, LLC
Director since 1996

Ingrid Zhang
President, China – Innovative Medicines,
Novartis
Director since 2023

*Will not stand for re-election in May 2023 www.mt.com