

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

- Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the fiscal year ended December 31, 2019 or
 Transition Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

Commission file number 1-8002

THERMO FISHER SCIENTIFIC INC.

(Exact name of Registrant as specified in its charter)

Delaware
(State of incorporation)

04-2209186
(I.R.S. Employer Identification No.)

168 Third Avenue
Waltham, Massachusetts 02451
(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code: (781) 622-1000

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, \$1.00 par value	TMO	New York Stock Exchange
Floating Rate Notes due 2020	TMO /20A	New York Stock Exchange
2.150% Notes due 2022	TMO 22A	New York Stock Exchange
0.750% Notes due 2024	TMO 24A	New York Stock Exchange
0.125% Notes due 2025	TMO 25B	New York Stock Exchange
2.000% Notes due 2025	TMO 25	New York Stock Exchange
1.400% Notes due 2026	TMO 26A	New York Stock Exchange
1.450% Notes due 2027	TMO 27	New York Stock Exchange
0.500% Notes due 2028	TMO 28A	New York Stock Exchange
1.375% Notes due 2028	TMO 28	New York Stock Exchange
1.950% Notes due 2029	TMO 29	New York Stock Exchange
0.875% Notes due 2031	TMO 31	New York Stock Exchange
2.875% Notes due 2037	TMO 37	New York Stock Exchange
1.500% Notes due 2039	TMO 39	New York Stock Exchange
1.875% Notes due 2049	TMO 49	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 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 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 during the preceding 12 months. Yes No

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

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

As of June 28, 2019, the aggregate market value of the voting stock held by nonaffiliates of the Registrant was approximately \$117,442,498,000 (based on the last reported sale of common stock on the New York Stock Exchange Composite Tape reporting system on June 28, 2019).

As of February 1, 2020, the Registrant had 398,828,389 shares of Common Stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Sections of Thermo Fisher's definitive Proxy Statement for the 2020 Annual Meeting of Shareholders are incorporated by reference into Parts II and III of this report.

THERMO FISHER SCIENTIFIC INC.
ANNUAL REPORT ON FORM 10-K
FOR THE FISCAL YEAR ENDED DECEMBER 31, 2019
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PART I

Item 1. Business

General Development of Business

Thermo Fisher Scientific Inc. (also referred to in this document as “Thermo Fisher,” “we,” the “company,” or the “registrant”) is the world leader in serving science. Our Mission is to enable our customers to make the world healthier, cleaner and safer. We serve more than 400,000 customers working in pharmaceutical and biotech companies, hospitals and clinical diagnostic labs, universities, research institutions and government agencies, as well as environmental, industrial quality and process control settings. Our global team of more than 75,000 colleagues delivers a unique combination of innovative technologies, purchasing convenience and pharmaceutical services through our industry-leading brands, including Thermo Scientific, Applied Biosystems, Invitrogen, Fisher Scientific, Unity Lab Services and Patheon.

We continuously increase our depth of capabilities in technologies, software and services, and leverage our extensive global channels to address our customers’ emerging needs. We do this through organic investments in research and development and through acquisitions. For example, in April 2019, we acquired, within the Laboratory Products and Services segment, Brammer Bio, expanding our contract manufacturing capabilities to include a full-range of viral vector development and manufacturing services. Our goal is to make our customers more productive in an increasingly competitive business environment, and to allow them to solve their challenges, from complex research to improved patient care, environmental and process monitoring, and consumer safety.

Thermo Fisher is a Delaware corporation and was incorporated in 1956. The company completed its initial public offering in 1967 and was listed on the New York Stock Exchange in 1980.

Forward-looking Statements

Forward-looking statements, within the meaning of Section 21E of the Securities Exchange Act of 1934 (the Exchange Act), are made throughout this Annual Report on Form 10-K. Any statements contained herein that are not statements of historical fact may be deemed to be forward-looking statements, including without limitation statements regarding: projections of revenue, expenses, earnings, margins, tax rates, tax provisions, cash flows, pension and benefit obligations and funding requirements, our liquidity position; cost reductions, restructuring activities, new product and service developments, competitive strengths or market position, acquisitions or divestitures; growth, declines and other trends in markets we sell into; new or modified laws, regulations and accounting pronouncements; outstanding claims, legal proceedings, tax audits and assessments and other contingent liabilities; foreign currency exchange rates and fluctuations in those rates; general economic and capital markets conditions; the timing of any of the foregoing; assumptions underlying any of the foregoing; and any other statements that address events or developments that Thermo Fisher intends or believes will or may occur in the future. Without limiting the foregoing, the words “believes,” “anticipates,” “plans,” “expects,” “seeks,” “estimates,” and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements are accompanied by such words. While the company may elect to update forward-looking statements in the future, it specifically disclaims any obligation to do so, even if the company’s estimates change, and readers should not rely on those forward-looking statements as representing the company’s views as of any date subsequent to the date of the filing of this report.

A number of important factors could cause the results of the company to differ materially from those indicated by such forward-looking statements, including those detailed under the heading, “[Risk Factors](#)” in Part I, Item 1A.

Business Segments and Products

We report our business in four segments – Life Sciences Solutions, Analytical Instruments, Specialty Diagnostics, and Laboratory Products and Services.

Life Sciences Solutions Segment

Through our Life Sciences Solutions segment, we provide an extensive portfolio of reagents, instruments and consumables used in biological and medical research, discovery and production of new drugs and vaccines as well as diagnosis of disease. These products and services are used by customers in pharmaceutical, biotechnology, agricultural, clinical, academic, and government markets. Life Sciences Solutions includes four primary businesses – Biosciences, Genetic Sciences, Clinical Next-Generation Sequencing, and BioProduction.

Biosciences

Our biosciences business includes reagents, instruments and consumables that help our customers conduct biological and medical research, discover new drugs and vaccines, and, in the case of some specific products, the diagnosis of disease.

Business (continued)

Our biosciences offerings include:

- Reagents, instruments, and consumables used for protein biology, molecular biology, sample preparation and cell imaging and analysis. The portfolio includes antibodies and products for protein purification, detection, modification, and analysis; and sequencing, detection and purification products used for high content analysis of nucleic acids. Many of these products are also used in applied markets, including agriculture, forensics, diagnostics product development, and toxicology research.
- Tools used for genetic engineering, amplification, quantification and analysis as well as RNA isolation, including stem cell reprogramming kits, transfection reagents, RNA interference reagents, along with gene editing tools and gene synthesis products.
- Cell culture media, reagents, and plastics for preserving and growing mammalian cells which are used in many life science research applications.
- Fluorescence-based technologies, which facilitate the labeling of molecules for biological research and drug discovery. These technologies include a wide range of cell analysis instruments, including flow cytometers and imaging platforms that enable fluorescence microscopy.
- Protein analysis products, including pre-cast electrophoresis gels for separating nucleic acids and proteins, and western blotting and staining tools.

Genetic Sciences

Our genetic sciences business combines a wide variety of instruments and related reagents used to provide high-value genomic solutions to assist customer decisions in the research, clinical and applied markets.

Our offerings include real-time PCR technology used to identify changes in gene expression, genotyping or proteins on an individual gene-by-gene basis; capillary electrophoresis (CE) sequencing, a core technology used in DNA sequencing and fragment analysis and forensic analysis applications; and microarray technology, used in gene expression, genotyping and reproductive health.

Our genetic analyzers served as the foundational platform used to sequence the first human genome. These systems are used in a variety of basic, commercial and clinical research applications.

Clinical Next-Generation Sequencing

Our clinical next-generation sequencing (NGS) business focuses on delivering simple, fast and cost-effective NGS technology for a range of applications. The business is focused on targeted sequencing solutions for research use and the application of NGS in oncology.

BioProduction

Our bioproduction business supports developers and manufacturers of biological-based therapeutics and vaccines with a portfolio of premium solutions and services focused on upstream cell culture, downstream purification, analytics for detection and quantitation of process/product impurities, and a suite of single-use solutions spanning the biologics workflow.

Our bioproduction offerings include:

- Single-use bioproduction solutions that provide our customers with faster turnaround and set-up times, minimal validation requirements, reduced investment and running costs, and increased flexibility of manufacturing capacity.
- Production cell culture media solutions, which are used by leading biotechnology and pharmaceutical companies to grow cells in controlled conditions and enable large scale cGMP (Current Good Manufacturing Practices) manufacturing of drugs and vaccines. We also provide our customers with the associated services to optimize the productivity of these production platforms.
- Chromatography products, which deliver superior capacity and resolution for process-scale bioseparations, and offer a broad set of scalable options for the purification of antibodies, antibody fragments and proteins.
- Rapid molecular products that deliver accurate results in less than four hours for contaminant detection, identification and quantitation.
- Scalable solutions for the manufacture of cell therapy based drugs.

Business (continued)

Our Doe & Ingalls offerings include chemical distribution and supply chain services that provide primarily life science manufacturers with reliable, secure supply chains for their chemical raw materials.

Analytical Instruments Segment

Through our Analytical Instruments segment, we provide a broad offering of instruments, consumables, software and services that are used for a range of applications in the laboratory, on the production line and in the field. These products and services are used by customers in pharmaceutical, biotechnology, academic, government, environmental and other research and industrial markets, as well as the clinical laboratory. This segment includes three primary businesses – Chromatography and Mass Spectrometry, Chemical Analysis, and Materials and Structural Analysis.

Chromatography and Mass Spectrometry

Our chromatography and mass spectrometry (MS) business provides analytical instrumentation for organic and inorganic sample analysis across both applied technologies and life science research. These products are complemented by laboratory information management systems (LIMS); chromatography data systems (CDS); database analytical tools; automation systems; a range of consumables, such as a full line of chromatography columns; and a range of sample preparation and separation products including auto-samplers and multiplexing systems.

Chromatography is a technique for separating, identifying and quantifying individual chemical components of substances based on their specific physical and chemical characteristics. Our chromatography product line includes high performance liquid chromatography, ion chromatography and gas chromatography systems, all of which are supported by our Chromeleon chromatography data system software.

- *Liquid Chromatography (LC) Systems* analyze complex sample matrices in liquids. Our high-pressure liquid chromatography (HPLC) and ultrahigh pressure liquid chromatography (UHPLC) systems offer high throughput and sensitivity and are sold either as stand-alone systems or integrated with our mass spectrometers (LC/MS and LC/MS/MS). These systems are used for a range of applications, from complex proteomic analyses to routine industrial quality assurance and quality control (QA/QC).
- *Ion Chromatography (IC) Systems* separate ionic (charged) or highly polar molecules (e.g., sugars and carbohydrates), usually found in water-based solutions, and typically detect them based on their electrical conductivity. Our IC products are used in a wide range of applications, including scientific research, and environmental testing, as well as quality control in pharmaceutical, food and beverage, and other industrial processes.
- *Gas Chromatography (GC) Systems* analyze complex sample matrices in gases, comprising both separation and detection technology. Separation technology is common to all gas chromatography analyzers, and is paired with either a conventional detector (GC) or with different types of mass spectrometers (GC/MS). Our GC/MS offering includes a triple stage quadrupole, a single stage quadrupole, an Orbitrap, and an ion trap, for a range of applications, including food safety testing, quantitative screening of environmental samples, and complex molecular analyses.
- *Elemental Analysis Spectrometers* use atomic spectroscopy techniques to identify trace concentrations of elements in liquid and solid samples primarily in environmental, petrochemical, food safety, metallurgical, geochemical and clinical/toxicology research applications. These products are widely used in growth markets such as China, India and Latin America to support compliance with increasingly stringent international environmental and consumer safety regulations.

Mass spectrometry is a technique for analyzing chemical compounds, individually or in complex mixtures, by forming charged ions that are then analyzed according to their mass-to-charge ratios. In addition to molecular information, each discrete chemical compound generates a pattern that provides structurally identifiable information. Our comprehensive offering includes life sciences mass spectrometry systems; and inorganic mass spectrometry systems; as well as a range of sample preparation and separation products including auto-samplers and multiplexing systems.

- *Life Sciences Mass Spectrometers* include triple quadrupole and Orbitrap technologies. Our triple quadrupole systems provide high performance quantitative analysis of chemicals in biological fluids, environmental samples and food matrices. They are also used by the pharmaceutical industry for targeted quantitation during drug discovery. Our Orbitrap technologies provide high resolution and accurate mass capabilities for both research and applied markets and are well suited for drug metabolism, proteomics, environmental analysis, food safety, toxicology and clinical research applications. We also offer a comprehensive portfolio of instrument control and data analysis software to help customers simplify their workflows and obtain knowledge from often complex data.

Business (continued)

- *Inorganic Mass Spectrometers* include four product lines: isotope ratio mass spectrometry (IRMS); multi-collector isotope ratio mass spectrometry (MC/IRMS); inductively coupled plasma mass spectrometry (ICP/MS); and high resolution trace mass spectrometry (HR Trace/MS). These products are primarily used for qualitative and quantitative analysis of inorganic matter in a range of applications, including environmental analysis, materials science and earth sciences.

Chemical Analysis

Our chemical analysis products fall into three main categories: materials and minerals instruments; field safety instruments; and environmental and process instruments. Customers use these products to quickly and accurately analyze the composition of materials to optimize workflows primarily in industrial applications or to help them comply with governmental regulations and industry safety standards. Our product lines range from those used on production lines to improve quality and efficiency, to portable systems for rapid and real-time chemical identification in the field or to analyze, measure or respond to hazardous situations.

- *Materials and Minerals Instruments* include production line process monitoring, and control systems for a range of industrial applications. For example, we offer on-line instruments that analyze bulk materials non-invasively and in real time to improve quality control and ensure safe operation in a mine or cement manufacturing plant, as well as systems that enable high-speed weighing during bulk materials handling. We also offer gauging systems that employ ionizing and non-ionizing technologies to measure the total thickness, basis weight and coating thickness of flat-sheet materials, such as steel, plastics, foil, rubber and glass. We also offer on-line analyzers based on a variety of technologies such as X-ray imaging and ultra-trace chemical detection, to inspect packaged goods for physical contaminants, validate fill quantities, or check for missing or broken parts on-line and at high speeds in the food and beverage, pharmaceutical production and packaging industries to maintain safety and quality standards.
- *Field Safety Instruments* are rugged handheld products that provide rapid, precise, real-time analysis at the point of need. Our main product categories are elemental analyzers, optical analyzers and radiation detection instruments. Our portable elemental analyzers use X-ray fluorescence (XRF) technology for identifying metal alloys in scrap metal recycling; QA/QC; precious metals analysis; environmental analysis; and lead screening in a range of consumer products. Our portable optical analyzers utilize Raman, Fourier transform infrared (FTIR) and near-infrared (NIR) technologies for use in the field by first responders, and law enforcement and military personnel who need to quickly and accurately identify chemicals and explosives in critical safety and security situations. Other applications include QA/QC in pharmaceutical production and identification of counterfeit drugs. Our radiation measurement products are used to monitor, detect and identify specific forms of radiation in nuclear power, environmental, industrial, medical, and security applications. Our primary customers include national, regional, and local government agencies responsible for monitoring cargo, vehicles and people traveling across borders. These products are also used by first-responders in safety and security situations, and for worker safety in the nuclear power and other industrial markets.
- *Environmental and Process Instruments* include fixed and portable instrumentation that help our customers protect people and the environment as well as comply with government regulations and industry safety standards. Our products are used by environmental regulatory agencies and power plant operators to measure ambient air, and stack gas emissions for compliance with regulated emissions standards for criteria pollutant gases. Our products are also used in ambient particulate monitoring applications by customers in mining environments to provide continuous measurements and logging of real-time concentrations and median particle sizes of airborne dust, smoke, mist and fumes to improve efficiency and increase worker safety.

In addition to our broad product offerings, we offer a variety of specialized services to our customers, including equipment servicing, instrument calibration services, asset management and training.

Materials and Structural Analysis

Our materials and structural analysis business includes electron microscopy, molecular spectroscopy and laboratory elemental analysis instruments that are used by customers in life sciences, materials sciences and industrial markets to accelerate breakthrough discoveries.

- *Electron Microscopy Instruments* include transmission electron microscopes which provide imaging and characterization at the atomic scale, with applications in semiconductor development, materials science research and the characterization of protein structure and function. We also offer scanning electron microscopes which resolve features from the optical regime down to the nanometer length scale and are used for a wide variety of applications from materials characterization in science and engineering to applications in natural resources, manufacturing, and biological systems. Our DualBeam focused ion beam-scanning electron microscope systems are used for sample

Business (continued)

preparation, 3D characterization, nanoprototyping, and industrial failure analysis. Our focused ion beam microscopes are used in a range of process control, failure analysis, and materials research applications. We also offer electrical failure analysis instruments which are used in root cause failure analysis and quality control, microCT instruments which are micro-computed tomography solutions for quantitative analysis of a broad range of materials, providing 3D visualization of large volumes non-destructively and 3D visualization software that turns the data and images generated by a broad range of instruments into 3D visualizations of the microscopic sample, allowing quantitative analysis of material properties.

- *Molecular Spectroscopy Instruments* are divided into four primary techniques: FTIR, Raman, NIR and ultraviolet/visible (UV/Vis) spectroscopy. These technologies are typically used in the laboratory to provide information on the structure of molecules to identify, verify and quantify organic materials in pharmaceutical, biotechnology, polymer, chemical, and forensic sciences. Our material characterization instruments include rheometers and extruders that measure viscosity, elasticity, processability, and temperature-related mechanical changes of various materials. We also provide a range of surface analysis instruments commonly used in the semiconductor, metals, coatings, and polymer industries as a product development and failure analysis tool.
- *Laboratory Elemental Analysis Instruments* and analyzers use X-ray fluorescence (XRF), X-ray diffraction (XRD), and arc spark optical emission (OES) techniques for accurate and precise analysis of bulk materials in the metals, cement, minerals, and petrochemicals industries.

Specialty Diagnostics Segment

Our Specialty Diagnostics segment offers a wide range of diagnostic test kits, reagents, culture media, instruments and associated products in order to serve customers in healthcare, clinical, pharmaceutical, industrial, and food safety laboratories. Our healthcare products are used to increase the speed and accuracy of diagnoses, which improves patient care in a more cost efficient manner. This segment has five primary businesses – Clinical Diagnostics, ImmunoDiagnostics, Microbiology, Transplant Diagnostics and our Healthcare Market Channel. In June 2019, the company sold its Anatomical Pathology business, previously reported in this segment. The business offered products primarily for cancer diagnosis and medical research in histology, cytology and hematology applications.

Clinical Diagnostics

Our clinical diagnostics products include a broad offering of liquid, ready-to-use and lyophilized immunodiagnostic reagent kits, calibrators, controls and calibration verification fluids. In particular, we provide products used for drugs-of-abuse testing; therapeutic drug monitoring, including immunosuppressant drug testing; thyroid hormone testing; serum toxicology; clinical chemistry; immunology; hematology; coagulation; glucose tolerance testing; first trimester screening; tumor markers testing; and biomarkers testing for sepsis, acute myocardial infarction and congestive heart failure. We also private label many of our reagents and controls for major *in vitro* diagnostics companies through OEM arrangements. In many instances, we will work with customers or partners to develop new products and applications for their instrument platforms.

We have developed one of the broadest menus for drugs-of-abuse immunoassays. We also provide a broad offering of immunosuppressant drug immunoassays that can be used on a variety of clinical chemistry analyzers.

Our clinical chemistry systems include analyzers and reagents to analyze and measure routine blood and urine chemistry, such as glucose and cholesterol; and advanced testing for specific proteins, therapeutic drug monitoring and drugs-of-abuse. Our diagnostic test range currently covers approximately 80 different validated methods. We also provide pre- and post-analytical automation for preparation of blood specimens before and after analysis, and specialty diagnostic tests based on patented biomarkers for sepsis, cardiovascular and pulmonary diseases, as well as intensive care treatments and prenatal screening.

ImmunoDiagnostics

Our immunodiagnosics offerings include developing, manufacturing and marketing complete blood-test systems to support the clinical diagnosis and monitoring of allergy, asthma and autoimmune diseases. In addition, we offer antibody tests for approximately 20 indications to help diagnose autoimmune diseases such as rheumatoid arthritis, celiac disease, lupus and scleroderma. Our products include ImmunoCAP for allergy and asthma tests and EliA for autoimmunity tests.

Microbiology

Our microbiology offerings include dehydrated and prepared culture media, collection and transport systems, instrumentation and consumables to detect pathogens in blood, diagnostic and rapid direct specimen tests, quality-control products and associated products for the microbiology laboratory. Our products help customers worldwide to diagnose

Business (continued)

infectious disease; determine appropriate antimicrobial therapy; implement effective infection control programs; and detect microbial contamination of their products or manufacturing facilities.

Within the food and pharmaceutical industries, our products are used to assure the safety and quality of consumer products by monitoring production environments; raw materials and end products for bacterial contamination; and animal health in the dairy industry.

Transplant Diagnostics

Our transplant diagnostics products include human leukocyte antigen (HLA) typing and testing for the organ transplant market. Our diagnostic tests are used by transplant centers for tissue typing, primarily to determine the compatibility of donors and recipients pre-transplant, and to detect the presence of antibodies post-transplant that can lead to transplant rejection. These transplant diagnostic tests are widely used across the transplant-testing workflow to improve patient outcomes. Our transplant diagnostic offerings include several lines of HLA typing and antibody detection assays utilizing serological, molecular, enzyme-linked immunosorbent assays (ELISA), flow, and multiplexing technologies.

Healthcare Market Channel

Our healthcare market channel offerings include a broad array of consumables, diagnostic kits and reagents, equipment, instruments, solutions and services for hospitals, clinical laboratories, reference laboratories, physicians' offices and other clinical testing facilities. These products are manufactured by Thermo Fisher and third parties and are primarily used in clinical diagnosis.

Laboratory Products and Services Segment

Our Laboratory Products and Services segment offers virtually everything needed for the laboratory. Our unique combination of self-manufactured and sourced products and extensive service offering, enables our customers to focus on their core activities and helps them to be more efficient, productive and cost effective. The segment also includes a comprehensive offering of outsourced services used by the pharmaceutical and biotech industries for drug development, clinical trials logistics and commercial drug manufacturing. We serve the pharmaceutical, biotechnology, academic, government and other research and industrial markets, as well as the clinical laboratory through four key businesses: Laboratory Products, Laboratory Chemicals, Research and Safety Market Channel, and Pharma Services.

Laboratory Products

Our laboratory products are used primarily by pharmaceutical companies for drug discovery and development and by biotechnology companies and universities for life science research to advance the prevention and cure of diseases and enhance quality of life. This offering consists of equipment, accessories, and services for sample preparation, storage and protection, and analysis:

- *Laboratory Equipment Technologies* includes our leading laboratory refrigerators and freezers, ultralow-temperature freezers and cryopreservation storage tanks for maintaining samples in a cold environment to protect them from degradation. We also offer temperature control products such as heated bath circulators, immersion coolers, recirculating chillers, water baths, and dry baths in a range of sizes, temperatures and configurations for life science, analytical chemistry, manufacturing and quality-control applications. In addition, we offer sample preparation and preservation equipment, which protects our customers' chemical and biological samples and supports the growth of cells and organisms in optimal conditions such as temperature, carbon dioxide and humidity as well as incubators and related products. We also offer centrifugation products, which are used to separate biological matrices and inorganic materials, including microcentrifuges, general use bench-top centrifuges and floor models. Additionally, we offer biological safety cabinets, which enable technicians to handle samples without risk to themselves or their environment and without risk of cross-contamination of samples.
- *Water and Laboratory Products* include water analysis instruments such as meters, electrodes and solutions for the measurement of pH, ions, conductivity, dissolved oxygen, turbidity and other key parameters in the lab and production line. We also offer other laboratory equipment such as water purification systems, shakers, vacuum concentrators, microbiological incubators, ovens, furnaces, hotplates, stirrers, stirring hotplates, and other related products.
- *Laboratory Plastics Essentials* include a leading offering of laboratory pipette tips and a complementary range of handheld and automated pipetting systems, supporting low-through high-throughput activity. These products optimize productivity and ergonomics, and ensure accurate results. We also offer sample preparation and storage products such as centrifugation consumables as well as vials and organization systems for ultralow temperature and cryogenic storage, with specific products designed for low protein binding and low DNA binding and containers for packaging

Business (continued)

life science and diagnostic reagents as well for the storage and transport of bulk intermediates and active pharmaceutical ingredients. Additionally, our offerings include a complete selection of clinical specimen collection products, drug-of-abuse collection kits and environmental and food-safety glass and plastic vials, bottles and containers, plastic transfer pipettes, general purpose clinical laboratory consumables and containers for breast milk collection, storage and feeding primarily used in neo-natal units and by lactation specialists. We also provide OEM and custom kit assembly services for clinical and drugs-of-abuse test kits.

Laboratory Chemicals

Our laboratory chemicals offering comprises a broad range of chemicals, solvents and reagents supporting virtually every laboratory application – from research to drug discovery and development and manufacturing. This portfolio includes organic chemicals used to synthesize new materials; essential laboratory chemicals used by scientists to purify, extract, separate, identify and manufacture products; high-purity analytical reagents, bioreagents used in many different applications, from cell growth to detailed protein analysis; novel chemical building blocks, reactive intermediates and screening libraries used to accelerate drug discovery; and precious metals, salts and solutions used in a broad range of applications where highly specific reactions are desired. We provide bulk volumes of many products for scale-up from research to development and customized services for chemical procurement, processing, production, testing, and packaging.

Research and Safety Market Channel

Our research and safety market channel serves academic, pharmaceutical, biotechnology, government and industrial customers. We go to market through our expert sales force, segment-relevant printed collateral and digital content in five languages, a state-of-the-art website, www.fishersci.com, containing full product content for more than 1.5 million products, and our global network of resellers and distributors.

We have an international network of warehouses in our primary markets through which we maintain inventory and coordinate product delivery. With specialized product vaults and warehouse management systems, we are able to handle the complete range of products we offer to our customers. Our transportation capabilities include our dedicated fleet of delivery vehicles as well as parcel shipping capabilities that are closely integrated with our third-party parcel carriers. Throughout the product delivery process, we provide our customers with convenient access to comprehensive electronic systems that offer automated catalog search, product order and invoicing, and payment capabilities.

Our channel offers a mix of products that are manufactured by Thermo Fisher, by third parties for us on a private-label basis, and by third parties under their brand but offered for sale exclusively through us. We also offer a broad range of third-party products representing leading industry brand names on a non-exclusive basis.

Our research products include a complete offering of laboratory products, ranging from capital equipment and instruments to chemicals to consumable products. Our safety products include clean-room and controlled-environment supplies, personal protective equipment, firefighting, military, and first responder equipment and supplies, and environmental monitoring and sampling equipment. Our education products include science-related and laboratory products for the K-12 and secondary education market.

In addition to our broad product offerings, we offer a variety of specialized services to our customers through our Unity Lab Services team, including training, equipment servicing and asset management, and dedicated supply management personnel. We also offer scientific support services including desktop delivery, coordination of instrument calibration and service, and on-site customer service.

Pharma Services

We provide the entire spectrum of development, manufacturing and clinical trials services for both small-molecule and large-molecule pharmaceuticals. This includes i) development of a suitable formulation and manufacturing process for the active pharmaceutical ingredient (API) or biologic; ii) technology transfer to scale up the manufacturing; iii) labeling, packaging, distribution and logistics for clinical trials; and iv) commercial scale manufacturing and packaging.

- *Drug Substance Services* - Our service offerings address small molecules, produced through chemical synthesis, and large molecules such as antibodies and proteins produced through mammalian cell culture. We provide development and manufacturing services for small molecule APIs and the biologically active component of pharmaceutical products under current good manufacturing practice (cGMP) conditions from early development through commercial production.
- *Drug Product Services* - We manufacture both small-molecule and large-molecule products for customers in conventional and specialized dosage forms. We differentiate ourselves by our breadth of dosage forms and specialized

Business (continued)

capabilities in both oral solid and sterile dosage forms. We provide a wide spectrum of advanced formulation, production and technical services and scientific expertise and solutions, from the early stages of a product's development to regulatory approval and commercial scale production.

- *Clinical Trials Services* - We provide global services for pharmaceutical and biotechnology companies engaged in clinical trials, including comparator sourcing; specialized packaging; over-encapsulation; multi-lingual and specialized labeling and distribution for phase I through phase IV clinical trials; biological-specimen management and biobanking services; specialty pharmaceutical logistics; and clinical supply-chain planning and management.
- *Viral Vector Services* - We provide a full-range of viral vector development and manufacturing services for customers developing and commercializing gene and cell therapies, including process development, optimization, scale-up, analytical development and qualification of viral vectors for commercial manufacturing. Our breadth of vector platform includes the five most widely used virus types, providing extensive coverage across the gene and cell therapy landscape.

Sales and Marketing

We market and sell our products and services through a direct sales force, customer-service professionals, electronic commerce, third-party distributors and various catalogs.

We offer our products and services through leading brands including:

- The Thermo Scientific brand offers customers in research, diagnostics, industrial, and applied markets a complete range of high-end analytical instruments as well as laboratory equipment, software, services, consumables and reagents. Our portfolio of products includes innovative technologies for mass spectrometry, chromatography, elemental analysis, electron microscopy, molecular spectroscopy, sample preparation, informatics, chemical research and analysis, cell culture, bioprocess production, cellular, protein and molecular biology research, allergy testing, drugs-of-abuse testing, therapeutic drug monitoring testing, microbiology, as well as environmental monitoring and process control.
- The Applied Biosystems brand offers customers in research, clinical and applied markets integrated instrument systems, reagents, and software for genetic analysis. Our portfolio includes innovative technologies for genetic sequencing and real-time, digital and end point polymerase chain reaction (PCR), that are used to determine meaningful genetic information in applications such as cancer diagnostics, human identification testing, and animal health, as well as inherited and infectious disease.
- The Invitrogen brand offers life science customers a broad range of consumables and instruments that accelerate research and ensure consistency of results. Our portfolio of products includes innovative solutions for cellular analysis and biology, flow cytometry, cell culture, protein expression, synthetic biology, molecular biology and protein biology.
- Fisher Scientific is our channels brand, offering customers a complete portfolio of laboratory equipment and consumables, chemicals, supplies and services used in scientific research, healthcare, safety, and education markets. These products are offered through an extensive network of direct sales professionals, segment-relevant printed collateral and digital content, a state-of-the-art website, and supply-chain management services.
- Unity Lab Services is our instrument and equipment services brand, offering a complete portfolio of services from enterprise level engagements to individual instruments and laboratory equipment, regardless of the original manufacturer. Through our network of world-class service and support personnel, we provide services that are designed to help our customers improve productivity, reduce costs, and drive decisions with better data.
- Patheon is our contract development and manufacturing brand, representing the comprehensive offering of services that we provide to customers ranging from small biotech to large pharmaceutical companies. We support our customers' development of innovative medicines, including biologics, gene therapies and vaccines. By leveraging our expanding global network of facilities, we deliver high-quality services at all stages of the drug lifecycle, from discovery to development through clinical trials and commercial manufacturing.

We have approximately 13,000 sales personnel including highly trained technical specialists who enable us to better meet the needs of our more technical end-users. We also provide customers with product standardization and other supply-chain-management services to reduce procurement costs.

Business (continued)

New Products and Research and Development

Our business includes the development and introduction of new products and may include entry into new business segments. We anticipate that we will continue to make significant expenditures for research and development as we seek to provide a continuing flow of innovative products to maintain and improve our competitive position.

Raw Materials

Our management team believes that we have a readily available supply of raw materials for all of our significant products from various sources. We do not anticipate any difficulties obtaining the raw materials essential to our business.

Raw material and fuel prices are subject to fluctuations due to market conditions. We employ many strategies, including the use of alternative materials, to mitigate the effect of these fluctuations on our results.

Patents, Licenses and Trademarks

Patents are important in many aspects of our business. No particular patent, or related group of patents, is so important, however, that its loss would significantly affect our operations as a whole. Where appropriate, we seek patent protection for inventions and developments made by our personnel that are incorporated into our products or otherwise fall within our fields of interest. Patent rights resulting from work sponsored by outside parties do not always accrue exclusively to the company and may be limited by agreements or contracts.

We protect some of our technology as trade secrets and, where appropriate, we use trademarks or register trademarks used in connection with products. We also enter into license agreements with others to grant and/or receive rights to patents and know-how.

Seasonal Influences

Revenues in the fourth quarter are historically stronger than in other quarters due to the capital spending patterns of industrial, pharmaceutical and government customers. Sales of flu tests and related diagnostic products vary quarter to quarter and year to year based on the severity and duration of each period's flu season. Sales of allergy tests vary quarter to quarter and year to year based on the severity and duration of each period's airborne pollen allergens.

Working Capital Requirements

There are no special inventory requirements or credit terms extended to customers that would have a material adverse effect on our working capital.

Dependency on a Single Customer

There is no single customer the loss of which would have a material adverse effect on our business. No customer accounted for more than 5% of our total revenues in any of the past three years.

Backlog

Our backlog of firm orders at year-end 2019 and 2018 was as follows:

(In millions)	2019	2018
Life Sciences Solutions	\$ 893	\$ 647
Analytical Instruments	2,198	2,243
Specialty Diagnostics	172	187
Laboratory Products and Services	4,577	2,042
Eliminations	(72)	(32)
	<u>\$ 7,768</u>	<u>\$ 5,087</u>

We believe that approximately 63% of our backlog at the end of 2019 will be filled during 2020.

Government Contracts

Although the company transacts business with various government agencies, no government contract is of such magnitude that a renegotiation of profits or termination of the contract at the election of the government agency would have a material adverse effect on the company's financial results.

Business (continued)

Competition

The company encounters aggressive and able competition in virtually all of the markets we serve. Because of the diversity of our products and services, we face many different types of competitors and competition. Our competitors include a broad range of manufacturers and third-party distributors. Competitive climates in many of the markets we serve are characterized by changing technology and customer demands that require continuing research and development. Our success primarily depends on the following factors:

- technical performance and advances in technology that result in new products and improved price/performance ratios;
- product differentiation, availability and reliability;
- the depth of our capabilities;
- our reputation among customers as a quality provider of products and services;
- customer service and support;
- active research and application-development programs; and
- relative prices of our products and services.

Environmental Matters

We are subject to various laws and governmental regulations concerning environmental matters and employee safety and health in the United States and other countries. U.S. federal environmental legislation that affects us includes the Toxic Substances Control Act, the Resource Conservation and Recovery Act, the Clean Air Act, the Clean Water Act, the Safe Drinking Water Act, and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). We are also subject to regulation by the Occupational Safety and Health Administration (OSHA) concerning employee safety and health matters. The United States Environmental Protection Agency (USEPA), OSHA, and other federal agencies have the authority to promulgate regulations that have an effect on our operations.

In addition to these federal activities, various states have been delegated certain authority under the aforementioned federal statutes as well as having authority over these matters under state laws. Many state and local governments have adopted environmental and employee safety and health laws and regulations, some of which are similar to federal requirements.

A number of our operations involve the handling, manufacturing, use or sale of substances that are or could be classified as toxic or hazardous materials within the meaning of applicable laws. Consequently, some risk of environmental harm is inherent in our operations and products, as it is with other companies engaged in similar businesses.

Our expenses for environmental requirements are incurred generally for ongoing compliance and historical remediation matters. Based on current information, we believe that these compliance costs are not material. For historical remediation obligations, our expenditures relate primarily to the cost of permitting, installing, and operating and maintaining groundwater-treatment systems and other remedial measures.

Our Fair Lawn and Somerville, New Jersey facilities entered into administrative consent orders with the New Jersey Department of Environmental Protection in 1984 to maintain groundwater-remediation activities at these sites, and are currently under the State's Licensed Site Remediation Professional Program. As the owner of the Fair Lawn facility, we are listed as a potentially responsible party for remediation within an area called the Fair Lawn Wellfields Superfund Site, and, in 2008, the company and certain other parties entered into a consent order with the USEPA to complete a Remedial Investigation/Feasibility Study. In 2018, the USEPA issued a Record of Decision, including the scope of required remediation work based on findings of this study. In 2019, the company and another responsible party signed a proposed consent decree that, once approved by the court, requires the parties to finance and perform the required remediation work with USEPA oversight. In 2011, our Life Technologies subsidiary entered into a consent decree with the USEPA and other responsible parties to implement a groundwater remedy at the former Davis Landfill Superfund site in Smithfield, Rhode Island.

We record accruals for environmental liabilities based on current interpretations of environmental laws and regulations when it is probable that a liability has been incurred and the amount of such liability can be reasonably estimated. We calculate estimates based upon several factors, including reports prepared by environmental specialists and management's knowledge and experience with these environmental matters. We include in these estimates potential costs for investigation, remediation and operation and maintenance of cleanup sites. Accrued liabilities for environmental matters totaled \$66 million at December 31, 2019.

These environmental liabilities do not include third-party recoveries to which we may be entitled. We believe that our accrual is adequate for the environmental liabilities we currently expect to incur. As a result we believe that our ultimate liability with respect to environmental matters will not have a material adverse effect on our financial position, results of

Business (continued)

operations or cash flows. However, we may be subject to remedial or compliance costs due to future events, such as changes in existing laws and regulations, changes in agency direction or enforcement policies, developments in remediation technologies, changes in the conduct of our operations, and the effect of changes in accounting rules, which could have a material adverse effect on our financial position, results of operations or cash flows.

Regulatory Affairs

Our operations, and some of the products we offer, are subject to a number of complex and stringent laws and regulations governing the production, handling, transportation and distribution of chemicals, drugs and other similar products, including the operating and security standards of the Food and Drug Administration, the Drug Enforcement Administration, the Bureau of Alcohol, Tobacco, Firearms and Explosives, and various state boards of pharmacy as well as comparable state and foreign agencies. As Thermo Fisher's businesses also include export and import activities, we are subject to pertinent laws enforced by the U.S. Departments of Commerce, State and Treasury. In addition, our logistics activities must comply with the rules and regulations of the Department of Transportation, the Federal Aviation Administration and similar foreign agencies. While we believe we are in compliance in all material respects with such laws and regulations, any noncompliance could result in substantial fines or otherwise restrict our ability to provide competitive distribution services and thereby have an adverse effect on our financial condition. To date, none has had a material impact on our operations.

We are subject to laws and regulations governing government contracts, and failure to address these laws and regulations or comply with government contracts could harm our business by leading to a reduction in revenue associated with these customers. We have agreements relating to the sale of our products to government entities and, as a result, we are subject to various statutes and regulations that apply to companies doing business with the government. We are also subject to investigation for compliance with the regulations governing government contracts. A failure to comply with these regulations could result in suspension of these contracts, criminal, civil and administrative penalties or debarment.

Number of Employees

We have more than 75,000 employees.

Available Information

The company files annual, quarterly and current reports, proxy statements and other documents with the Securities and Exchange Commission (SEC) under the Exchange Act. The SEC maintains a website that contains reports, proxy and information statements and other information that issuers, including the company, file electronically with the SEC. The public can obtain any documents that we file with the SEC at www.sec.gov. We also make available free of charge on or through our own website at www.thermofisher.com our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and, if applicable, amendments to those reports filed or furnished pursuant to Section 13(a) of the Exchange Act as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. In addition, paper copies of these documents may be obtained free of charge by writing to the company care of its Investor Relations Department at our principal executive office located at 168 Third Avenue, Waltham, Massachusetts 02451.

THERMO FISHER SCIENTIFIC INC.

Business (continued)

Information about Our Executive Officers

Name	Age	Present Title (Fiscal Year First Became Executive Officer)	Other Positions Held
Marc N. Casper	51	Chairman, President and Chief Executive Officer (2001)	President and Chief Executive Officer (2009-2020) Chief Operating Officer (2008-2009) Executive Vice President (2006-2009)
Mark P. Stevenson	57	Executive Vice President and Chief Operating Officer (2014)	Executive Vice President and President, Life Sciences Solutions (2014-2017) President and Chief Operating Officer, Life Technologies Corporation (2008-2014)
Michel Lagarde	46	Executive Vice President (2017)	Senior Vice President and President, Pharma Services (2017-2019) President and Chief Operating Officer, Patheon N.V. (2016-2017) Managing Director, JLL Partners* (2008-2016)
Michael A. Boxer	58	Senior Vice President and General Counsel (2018)	Executive Vice President and Group General Counsel, Luxottica Group S.p.A. (2011-2017)
Syed A. Jafry	56	Senior Vice President and President, Regions (2019)	Senior Vice President, Asia-Pacific and Emerging Markets (2011-2017)
Stephen Williamson	53	Senior Vice President and Chief Financial Officer (2015)	Vice President, Financial Operations (2008-2015)
Peter E. Hornstra	60	Vice President and Chief Accounting Officer (2001)	Corporate Controller (1996-2007)

*JLL Partners is a private equity firm focused on healthcare.

Item 1A. Risk Factors

Set forth below are the risks that we believe are material to our investors. This section contains forward-looking statements. You should refer to the explanation of the qualifications and limitations on forward-looking statements in [Item 1. Business](#) under the caption “Forward-looking Statements”.

We must develop new products, adapt to rapid and significant technological change and respond to introductions of new products by competitors to remain competitive. Our growth strategy includes significant investment in and expenditures for product development. We sell our products in several industries that are characterized by rapid and significant technological changes, frequent new product and service introductions and enhancements and evolving industry standards. Competitive factors include technological innovation, price, service and delivery, breadth of product line, customer support, e-business capabilities and the ability to meet the special requirements of customers. Our competitors may adapt more quickly to new technologies and changes in customers’ requirements than we can. Without the timely introduction of new products, services and enhancements, our products and services will likely become technologically obsolete over time, in which case our revenue and operating results would suffer.

Many of our existing products and those under development are technologically innovative and require significant planning, design, development and testing at the technological, product and manufacturing-process levels. Our customers use many of our products to develop, test and manufacture their own products. As a result, we must anticipate industry trends and develop products in advance of the commercialization of our customers’ products. If we fail to adequately predict our customers’ needs and future activities, we may invest heavily in research and development of products and services that do not lead to significant revenue.

It may be difficult for us to implement our strategies for improving internal growth. Our growth depends in part on the growth of the markets which we serve. Any decline or lower than expected growth in our served markets could diminish demand for our products and services, which would adversely affect our results of operations and financial condition. To address this issue, we are pursuing a number of strategies to improve our internal growth, including:

- strengthening our presence in selected geographic markets;
- allocating research and development funding to products with higher growth prospects;
- developing new applications for our technologies;
- expanding our service offerings;

Risk Factors (continued)

- continuing key customer initiatives;
- combining sales and marketing operations in appropriate markets to compete more effectively;
- finding new markets for our products; and
- continuing the development of commercial tools and infrastructure to increase and support cross-selling opportunities of products and services to take advantage of our depth in product offerings.

We may not be able to successfully implement these strategies, and these strategies may not result in the expected growth of our business.

Our business is affected by general economic conditions and related uncertainties affecting markets in which we operate. Our business is affected by general economic conditions, both inside and outside the U.S. If the global economy and financial markets, or economic conditions in Europe, the U.S. or other key markets, are unstable, it could adversely affect the business, results of operations and financial condition of the company and its customers, distributors, and suppliers, having the effect of

- reducing demand for some of our products;
- increasing the rate of order cancellations or delays;
- increasing the risk of excess and obsolete inventories;
- increasing pressure on the prices for our products and services;
- causing supply interruptions which could disrupt our ability to produce our products; and
- creating longer sales cycles and greater difficulty in collecting sales proceeds.

Our growth could suffer if the markets into which we sell our products and services decline, do not grow as anticipated or experience cyclicity. Our growth depends in part on the growth of the markets which we serve. Any decline or lower than expected growth in our served markets could diminish demand for our products and services, which would adversely affect our financial statements. Certain of our businesses operate in industries that may experience periodic, cyclical downturns.

Demand for some of our products depends on capital spending policies of our customers and on government funding policies. Our customers include pharmaceutical and chemical companies, laboratories, universities, healthcare providers, government agencies and public and private research institutions. Many factors, including public policy spending priorities, available resources and product and economic cycles, have a significant effect on the capital spending policies of these entities.

Spending by some of these customers fluctuates based on budget allocations and the timely passage of the annual federal budget. An impasse in federal government budget decisions could lead to substantial delays or reductions in federal spending.

Economic, political, foreign currency and other risks associated with international sales and operations could adversely affect our results of operations. International markets contribute a substantial portion of our revenues, and we intend to continue expanding our presence in these regions. The exposure to fluctuations in currency exchange rates takes on different forms. International revenues and costs are subject to the risk that fluctuations in exchange rates could adversely affect our reported revenues and profitability when translated into U.S. dollars for financial reporting purposes. These fluctuations could also adversely affect the demand for products and services provided by us. As a multinational corporation, our businesses occasionally invoice third-party customers in currencies other than the one in which they primarily do business (the “functional currency”). Movements in the invoiced currency relative to the functional currency could adversely impact our cash flows and our results of operations. As our international sales grow, exposure to fluctuations in currency exchange rates could have a larger effect on our financial results. In 2019, currency translation had an unfavorable effect of \$440 million on revenues due to the strengthening of the U.S. dollar relative to other currencies in which the company sells products and services.

In addition, many of our employees, contract manufacturers, suppliers, job functions, outsourcing activities and manufacturing facilities are located outside the United States. Accordingly, our future results could be harmed by a variety of factors, including:

- interruption to transportation flows for delivery of parts to us and finished goods to our customers;
- changes in a specific country's or region's political, economic or other conditions;
- changes in diplomatic and trade relationships, including new tariffs, trade protection measures, import or export licensing requirements, trade embargoes and sanctions and other trade barriers;

Risk Factors (continued)

- tariffs imposed by the U.S. on goods from other countries and tariffs imposed by other countries on U.S. goods, including the tariffs recently adopted by the U.S. government on various imports from China and by the Chinese government on certain U.S. goods;
- the impact of public health epidemics on the global economy, such as the coronavirus currently impacting China;
- negative consequences from changes in tax laws;
- difficulty in staffing and managing widespread operations;
- differing labor regulations;
- differing protection of intellectual property;
- unexpected changes in regulatory requirements; and
- geopolitical uncertainty or turmoil, including terrorism and war.

For example, on January 31, 2020, the United Kingdom formally withdrew from the European Union, or EU and entered a transition period during which it will negotiate a trade deal with the EU. This withdrawal has created political and economic uncertainty, particularly in the United Kingdom and the EU, and this uncertainty may last for years. Our business could be affected during this period of uncertainty, and perhaps longer, by the impact of the United Kingdom's withdrawal from the EU. In addition, our business could be negatively affected by new trade agreements between the United Kingdom and other countries, including the United States, and by the possible imposition of trade or other regulatory barriers in the United Kingdom. These possible negative impacts, and others resulting from the United Kingdom's withdrawal from the EU, may adversely affect our operating results and our customers' businesses.

Our inability to protect our intellectual property could have a material adverse effect on our business. In addition, third parties may claim that we infringe their intellectual property, and we could suffer significant litigation or licensing expense as a result. We place considerable emphasis on obtaining patent and trade secret protection for significant new technologies, products and processes because of the length of time and expense associated with bringing new products through the development process and into the marketplace. Our success depends in part on our ability to develop patentable products and obtain and enforce patent protection for our products both in the United States and in other countries. We own numerous U.S. and foreign patents, and we intend to file additional applications, as appropriate, for patents covering our products. Patents may not be issued for any pending or future patent applications owned by or licensed to us, and the claims allowed under any issued patents may not be sufficiently broad to protect our technology. Any issued patents owned by or licensed to us may be challenged, invalidated or circumvented, and the rights under these patents may not provide us with competitive advantages. In addition, competitors may design around our technology or develop competing technologies. Intellectual property rights may also be unavailable or limited in some foreign countries, which could make it easier for competitors to capture increased market position. We could incur substantial costs to defend ourselves in suits brought against us or in suits in which we may assert our patent rights against others. An unfavorable outcome of any such litigation could materially adversely affect our business and results of operations.

We also rely on trade secrets and proprietary know-how with which we seek to protect our products, in part, by confidentiality agreements with our collaborators, employees and consultants. These agreements may be breached and we may not have adequate remedies for any breach. In addition, our trade secrets may otherwise become known or be independently developed by our competitors.

Third parties may assert claims against us to the effect that we are infringing on their intellectual property rights. In the event that a claim relating to intellectual property is asserted against us, or third parties not affiliated with us hold pending or issued patents that relate to our products or technology, we may seek licenses to such intellectual property or challenge those patents. However, we may be unable to obtain these licenses on commercially reasonable terms, if at all, and our challenge of the patents may be unsuccessful. Our failure to obtain the necessary licenses or other rights could prevent the sale, manufacture, or distribution of our products and, therefore, could have a material adverse effect on our business, financial condition and results of operations.

Changes in governmental regulations may reduce demand for our products or increase our expenses. We compete in many markets in which we and our customers must comply with federal, state, local and international regulations, such as environmental, health and safety and food and drug regulations. We develop, configure and market our products to meet customer needs created by those regulations. Any significant change in regulations could reduce demand for our products or increase our expenses. For example, we manufacture pharmaceuticals and many of our instruments are marketed to the

Risk Factors (continued)

pharmaceutical industry for use in discovering and developing drugs. Changes in the U.S. Food and Drug Administration's regulation of the drug discovery and development process could have an adverse effect on the demand for these products.

Our pharma services offerings are highly complex, and if we are unable to provide quality and timely offerings to our customers, our business could suffer. Our pharma services offerings are highly exacting and complex, due in part to strict quality and regulatory requirements. Our operating results in this business depend on our ability to execute and, when necessary, improve our quality management strategy and systems, and our ability to effectively train and maintain our employee base with respect to quality management. A failure of our quality control systems could result in problems with facility operations or preparation or provision of products. In each case, such problems could arise for a variety of reasons, including equipment malfunction, failure to follow specific protocols and procedures, problems with raw materials or environmental factors and damage to, or loss of, manufacturing operations. Such problems could affect production of a particular batch or series of batches of products, requiring the destruction of such products or a halt of facility production altogether.

In addition, our failure to meet required quality standards may result in our failure to timely deliver products to our customers, which in turn could damage our reputation for quality and service. Any such failure could, among other things, lead to increased costs, lost revenue, reimbursement to customers for lost drug product, registered intermediates, registered starting materials, and active pharmaceutical ingredients, other customer claims, damage to and possibly termination of existing customer relationships, time and expense spent investigating the cause and, depending on the cause, similar losses with respect to other batches or products. Production problems in our drug and biologic manufacturing operations could be particularly significant because the cost of raw materials for such manufacturing is often high. If problems in preparation or manufacture of a product or failures to meet required quality standards for that product are not discovered before such product is released to the market, we may be subject to adverse regulatory actions, including product recalls, product seizures, injunctions to halt manufacture and distribution, restrictions on our operations, civil sanctions, including monetary sanctions, and criminal actions. In addition, such problems or failures could subject us to litigation claims, including claims from our customers for reimbursement for the cost of lost or damaged active pharmaceutical ingredients, the cost of which could be significant.

We are subject to product and other liability risks for which we may not have adequate insurance coverage. We may be named as a defendant in product liability lawsuits, which may allege that products or services we have provided from our pharma services offerings have resulted or could result in an unsafe condition or injury to consumers. Additionally, products currently or previously sold by our environmental and process instruments and radiation measurement and security instruments businesses include fixed and portable instruments used for chemical, radiation and trace explosives detection. These products are used in airports, embassies, cargo facilities, border crossings and other high-threat facilities for the detection and prevention of terrorist acts. If any of these products were to malfunction, it is possible that explosive or radioactive material could fail to be detected by our product, which could lead to product liability claims. There are also many other factors beyond our control that could lead to liability claims, such as the reliability and competence of the customers' operators and the training of such operators.

Any such product liability claims brought against us could be significant and any adverse determination may result in liabilities in excess of our insurance coverage. Although we carry product liability insurance, we cannot be certain that our current insurance will be sufficient to cover these claims or that it can be maintained on acceptable terms, if at all.

Our inability to complete any pending acquisitions or to successfully integrate any new or previous acquisitions could have a material adverse effect on our business. Our business strategy includes the acquisition of technologies and businesses that complement or augment our existing products and services. Certain acquisitions may be difficult to complete for a number of reasons, including the need for antitrust and/or other regulatory approvals. Any acquisition we may complete may be made at a substantial premium over the fair value of the net identifiable assets of the acquired company. Further, we may not be able to integrate acquired businesses successfully into our existing businesses, make such businesses profitable, or realize anticipated cost savings or synergies, if any, from these acquisitions, which could adversely affect our business.

Moreover, we have acquired many companies and businesses. As a result of these acquisitions, we recorded significant goodwill and indefinite-lived intangible assets (primarily tradenames) on our balance sheet, which amount to approximately \$25.71 billion and \$1.25 billion, respectively, as of December 31, 2019. In addition, we have definite-lived intangible assets totaling \$12.76 billion as of December 31, 2019. We assess the realizability of goodwill and indefinite-lived intangible assets annually as well as whenever events or changes in circumstances indicate that these assets may be impaired. We assess the realizability of definite-lived intangible assets whenever events or changes in circumstances indicate that these assets may be impaired. These events or circumstances would generally include operating losses or a significant decline in earnings associated with the acquired business or asset. Our ability to realize the value of the goodwill and intangible assets will depend on the future cash flows of these businesses. These cash flows in turn depend in part on how well we have integrated these businesses.

Risk Factors (continued)

If we are not able to realize the value of the goodwill and intangible assets, we may be required to incur material charges relating to the impairment of those assets.

We are subject to laws and regulations governing government contracts, and failure to address these laws and regulations or comply with government contracts could harm our business by leading to a reduction in revenue associated with these customers. We have agreements relating to the sale of our products to government entities and, as a result, we are subject to various statutes and regulations that apply to companies doing business with the government. The laws governing government contracts differ from the laws governing private contracts and government contracts may contain pricing terms and conditions that are not applicable to private contracts. We are also subject to investigation for compliance with the regulations governing government contracts. A failure to comply with these regulations could result in suspension of these contracts, criminal, civil and administrative penalties or debarment.

Because we compete directly with certain of our larger customers and product suppliers, our results of operations could be adversely affected in the short term if these customers or suppliers abruptly discontinue or significantly modify their relationship with us. Our largest customer in the laboratory products business is also a significant competitor. Our business may be harmed in the short term if our competitive relationship in the marketplace with certain of our large customers results in a discontinuation of their purchases from us. In addition, we manufacture products that compete directly with products that we source from third-party suppliers. We also source competitive products from multiple suppliers. Our business could be adversely affected in the short term if any of our large third-party suppliers abruptly discontinues selling products to us.

Because we rely heavily on third-party package-delivery services, a significant disruption in these services or significant increases in prices may disrupt our ability to ship products, increase our costs and lower our profitability. We ship a significant portion of our products to our customers through independent package delivery companies, such as Federal Express in the U.S. and DHL in Europe. We also maintain a small fleet of vehicles dedicated to the delivery of our products and ship our products through other carriers, including national and regional trucking firms, overnight carrier services and the U.S. Postal Service. If one or more of these third-party package-delivery providers were to experience a major work stoppage, preventing our products from being delivered in a timely fashion or causing us to incur additional shipping costs we could not pass on to our customers, our costs could increase and our relationships with certain of our customers could be adversely affected. In addition, if one or more of these third-party package-delivery providers were to increase prices, and we were not able to find comparable alternatives or make adjustments in our delivery network, our profitability could be adversely affected.

We are required to comply with a wide variety of laws and regulations, and are subject to regulation by various federal, state and foreign agencies. We are subject to various local, state, federal, foreign and transnational laws and regulations, which include the operating and security standards of the U.S. Federal Drug Administration (the FDA), the U.S. Drug Enforcement Agency (the DEA), various state boards of pharmacy, state health departments, the U.S. Department of Health and Human Services (the DHHS), the European Medicines Agency (the EMA), in Europe, the EU member states and other comparable agencies and, in the future, any changes to such laws and regulations could adversely affect us. In particular, we are subject to laws and regulations concerning current good manufacturing practices and drug safety. Our subsidiaries may be required to register for permits and/or licenses with, and may be required to comply with the laws and regulations of the DEA, the FDA, the DHHS, foreign agencies including the EMA, and other various state boards of pharmacy, state health departments and/or comparable state agencies as well as certain accrediting bodies depending upon the type of operations and location of product distribution, manufacturing and sale.

The manufacture, distribution and marketing of many of our products and services, including medical devices and pharma services, are subject to extensive ongoing regulation by the FDA, the DEA, the EMA, and other equivalent local, state, federal and non-U.S. regulatory authorities. In addition, we are subject to inspections by these regulatory authorities. Failure by us or by our customers to comply with the requirements of these regulatory authorities, including without limitation, remediating any inspectional observations to the satisfaction of these regulatory authorities, could result in warning letters, product recalls or seizures, monetary sanctions, injunctions to halt manufacture and distribution, restrictions on our operations, civil or criminal sanctions, or withdrawal of existing or denial of pending approvals, including those relating to products or facilities. In addition, such a failure could expose us to contractual or product liability claims, contractual claims from our customers, including claims for reimbursement for lost or damaged active pharmaceutical ingredients, as well as ongoing remediation and increased compliance costs, any or all of which could be significant. We are the sole manufacturer of a number of pharmaceuticals for many of our customers and a negative regulatory event could impact our customers' ability to provide products to their customers.

We are also subject to a variety of federal, state, local and international laws and regulations that govern, among other things, the handling, transportation and manufacture of substances that could be classified as hazardous, and we are required to

Risk Factors (continued)

comply with various import laws and export control and economic sanctions laws, which may affect our transactions with certain customers. In certain circumstances, export control and economic sanctions regulations may prohibit the export of certain products, services and technologies. In other circumstances, we may be required to obtain an export license before exporting the controlled item. Compliance with the various import laws that apply to our businesses can restrict our access to, and increase the cost of obtaining, certain products and at times can interrupt our supply of imported inventory. Any noncompliance by us with applicable laws and regulations or the failure to maintain, renew or obtain necessary permits and licenses could result in criminal, civil and administrative penalties and could have an adverse effect on our results of operations.

Our reputation, ability to do business and financial statements may be impaired by improper conduct by any of our employees, agents or business partners. We have internal controls and compliance systems to protect the company against acts committed by employees, agents or businesses that we acquire that would violate U.S. and/or non-U.S. laws, including the laws governing payments to government officials, bribery, fraud, kickbacks and false claims, pricing, sales and marketing practices, conflicts of interest, competition, employment practices and workplace behavior, export and import compliance, money laundering and data privacy, but we cannot provide assurance that these controls and systems will prevent every such wrongful act. In particular, the U.S. Foreign Corrupt Practices Act, the U.K. Bribery Act and similar anti-bribery laws in other jurisdictions generally prohibit companies and their intermediaries from making improper payments to government officials for the purpose of obtaining or retaining business, and we operate in many parts of the world that have experienced governmental corruption to some degree. Any such improper actions or allegations of such acts could damage our reputation and subject us to civil or criminal investigations in the United States and in other jurisdictions and related shareholder lawsuits, could lead to substantial civil and criminal, monetary and nonmonetary penalties and could cause us to incur significant legal and investigatory fees. In addition, the government may seek to hold us liable for violations committed by companies which we acquire. We also rely on our suppliers to adhere to our supplier standards of conduct, and material violations of such standards of conduct could occur that could have a material effect on our business, reputation and financial statements.

Natural disasters, public health crises, political crises, and other catastrophic events or other events outside of our control may disrupt our facilities or the facilities of third parties on which we depend, and could impact customer spending. We have significant operations in California, near major earthquake faults, which make us susceptible to earthquake risk. An earthquake or other natural disaster such as a fire or hurricane or power shortages or outages could disrupt our operations or impair our critical systems. Any of these disruptions or other events outside of our control, such as strikes or other labor unrest, could have an adverse effect on our results of operations. In addition, if any of our facilities, including our manufacturing or warehouse facilities, or the facilities of our suppliers, third-party service providers, or customers, is affected by natural disasters, such as earthquakes, tsunamis, power shortages or outages, floods or monsoons, public health crises, such as pandemics and epidemics, political crises, such as terrorism, war, political instability or other conflict, or other events outside of our control, such as strikes or other labor unrest, our results of operations could be adversely affected. Moreover, these types of events could negatively impact customer spending in the impacted regions or depending upon the severity, globally, which could also adversely impact our operating results. For example, in December 2019, a strain of coronavirus surfaced in Wuhan, China which could have a material adverse effect on our business and results of operations. The effects could include restrictions on our ability to travel to support our sites in China or our customers located there, disruptions in our ability to distribute products, and/or temporary closures of our facilities in China or the facilities of our suppliers or customers. Related disruption, inside or outside of China, to our operations or the operations of our suppliers or customers would likely impact our sales and operating results. At this point, the extent to which the coronavirus may impact our results of operations is uncertain.

Fluctuations in our effective tax rate may adversely affect our results of operations and cash flows. As a global company, we are subject to taxation in numerous countries, states and other jurisdictions. In preparing our financial statements, we record the amount of tax that is payable in each of the countries, states and other jurisdictions in which we operate. Our future effective tax rate, however, may be lower or higher than experienced in the past due to numerous factors, including a change in the mix of our profitability from country to country, changes in accounting for income taxes and recently enacted and future changes in tax laws in jurisdictions in which we operate. Any of these factors could cause us to experience an effective tax rate significantly different from previous periods or our current expectations, which could have an adverse effect on our business, results of operations and cash flows.

We may incur unexpected costs from increases in fuel and raw material prices, which could reduce our earnings and cash flow. Our primary commodity exposures are for fuel, petroleum-based resins and steel. While we may seek to minimize the impact of price increases through higher prices to customers and various cost-saving measures, our earnings and cash flows could be adversely affected in the event these measures are insufficient to cover our costs.

Our reliance upon sole or limited sources of supply for certain materials or components could cause production interruptions, delays and inefficiencies. Some of our businesses purchase certain materials from sole or limited source suppliers for reasons of quality assurance, regulatory requirements, cost effectiveness, availability or uniqueness of design. If

Risk Factors (continued)

these or other suppliers encounter financial, operating or other difficulties or if our relationship with them changes, we might not be able to quickly establish or qualify replacement sources of supply. The supply chains for our businesses could also be disrupted by supplier capacity constraints, bankruptcy or exiting of the business for other reasons, decreased availability of key raw materials or commodities and external events such as natural disasters, pandemic health issues, war, terrorist actions, governmental actions and legislative or regulatory changes. Any of these factors could result in production interruptions, delays, extended lead times and inefficiencies.

A significant disruption in, or breach in security of, our information technology systems or violation of data privacy laws could adversely affect our business. As a part of our ongoing effort to upgrade our current information systems, we periodically implement new enterprise resource planning software and other software applications to manage certain of our business operations. As we implement and add functionality, problems could arise that we have not foreseen. Such problems could disrupt our ability to provide quotes, take customer orders and otherwise run our business in a timely manner. When we upgrade or change systems, we may suffer interruptions in service, loss of data or reduced functionality. In addition, if our new systems fail to provide accurate pricing and cost data our results of operations and cash flows could be adversely affected.

We also rely on our information technology systems to process, transmit and store electronic information (including sensitive data such as confidential business information and personally identifiable data relating to employees, customers and other business partners) and to manage or support a variety of critical business processes and activities (such as interacting with suppliers, selling our products and services, fulfilling orders and billing, collecting and making payments, shipping products, providing services and support to customers, tracking customer activity, fulfilling contractual obligations and otherwise conducting business). Our systems may be vulnerable to damage or interruption from natural disasters, power loss, telecommunication failures, terrorist attacks, computer hackers, computer viruses, ransomware, phishing, computer denial-of-service attacks, unauthorized access to customer or employee data or company trade secrets, and other attempts to harm our systems. Certain 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, among other consequences, interruptions in our services, which could harm our reputation and financial results. Any of the cyber-attacks, breaches or other disruptions or damage described above, if significant, could materially interrupt our operations, delay production and shipments, result in theft of our and our customers' intellectual property and trade secrets, damage customer, business partner and employee relationships and our reputation or result in defective products or services, legal claims and proceedings, liability and penalties under privacy laws and increased cost for security and remediation, each of which could adversely affect our business and financial results.

If we are unable to maintain reliable information technology systems and appropriate controls with respect to global data privacy and security requirements and prevent data breaches, we may suffer regulatory consequences in addition to business consequences. As a global organization, we are subject to data privacy and security laws, regulations, and customer-imposed controls in numerous jurisdictions as a result of having access to and processing confidential, personal and/or sensitive data in the course of our business. For example, in the United States, individual states regulate data breach and security requirements and multiple governmental bodies assert authority over aspects of the protection of personal privacy. European laws require us to have an approved legal mechanism to transfer personal data out of Europe, and the EU General Data Protection Regulation imposes significantly stricter requirements in how we collect and process personal data. Several countries, such as China and Russia, have passed laws that require personal data relating to their citizens to be maintained on local servers and impose additional data transfer restrictions. Government enforcement actions can be costly and interrupt the regular operation of our business, and data breaches or violations of data privacy laws can result in fines, reputational damage and civil lawsuits, any of which may adversely affect our business, reputation and financial statements.

Our debt may restrict our investment opportunities or limit our activities. As of December 31, 2019, we had approximately \$17.75 billion in outstanding indebtedness. In addition, we have availability to borrow under a revolving credit facility that provides for up to \$2.50 billion of unsecured multi-currency revolving credit. We may also obtain additional long-term debt and lines of credit to meet future financing needs, which would have the effect of increasing our total leverage.

Our leverage could have negative consequences, including increasing our vulnerability to adverse economic and industry conditions, limiting our ability to obtain additional financing and limiting our ability to acquire new products and technologies through strategic acquisitions.

Our ability to make scheduled payments, refinance our obligations or obtain additional financing will depend on our future operating performance and on economic, financial, competitive and other factors beyond our control. Our business may not generate sufficient cash flow to meet our obligations. If we are unable to service our debt, refinance our existing debt or obtain additional financing, we may be forced to delay strategic acquisitions, capital expenditures or research and development expenditures.

Risk Factors (continued)

Additionally, the agreements governing our debt require that we maintain certain financial ratios, and contain affirmative and negative covenants that restrict our activities by, among other limitations, limiting our ability to incur additional indebtedness, merge or consolidate with other entities, make investments, create liens, sell assets and enter into transactions with affiliates. The covenants in our revolving credit facility (the Facility) include a Consolidated Leverage Ratio (total debt-to-Consolidated EBITDA) and a Consolidated Interest Coverage Ratio (Consolidated EBITDA to Consolidated Interest Expense), as such terms are defined in the Facility. Specifically, the company has agreed that, so long as any lender has any commitment under the Facility, any letter of credit is outstanding under the Facility, or any loan or other obligation is outstanding under the Facility, it will maintain a maximum Consolidated Leverage Ratio of 3.5:1.0. The company has also agreed that so long as any lender has any commitment under the Facility or any letter of credit is outstanding under the Facility, or any loan or other obligation is outstanding under the Facility, it will maintain a minimum Consolidated Interest Coverage Ratio of 3.0:1.0 as of the last day of any fiscal quarter.

Our ability to comply with these financial restrictions and covenants is dependent on our future performance, which is subject to prevailing economic conditions and other factors, including factors that are beyond our control such as foreign exchange rates and interest rates. Our failure to comply with any of these restrictions or covenants may result in an event of default under the applicable debt instrument, which could permit acceleration of the debt under that instrument and require us to prepay that debt before its scheduled due date. Also, an acceleration of the debt under certain of our debt instruments would trigger an event of default under other of our debt instruments.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

The company owns and leases office, engineering, laboratory, production and warehouse space throughout the world.

Item 3. Legal Proceedings

There are various lawsuits and claims against the company involving product liability, intellectual property, employment and commercial issues. See “Note 12 to our Consolidated Financial Statements – Commitments and Contingencies.”

Item 4. Mine Safety Disclosures

Not applicable.

PART II

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

Market Price of Common Stock

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

Holders of Common Stock

As of February 1, 2020, the company had 3,154 holders of record of its common stock. This does not include holdings in street or nominee names.

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Issuer Purchases of Equity Securities

A summary of the share repurchase activity for the company's fourth quarter of 2019 follows:

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs (1)	Maximum Dollar Amount of Shares That May Yet Be Purchased Under the Plans or Programs (1) (in millions)
Fiscal October (Sep. 29 - Nov. 2)	2,636,305	\$ 284.49	2,636,305	\$ 500
Fiscal November (Nov. 3 - Nov. 30)	—		—	2,500
Fiscal December (Dec. 1 - Dec. 31)	—		—	2,500
Total Fourth Quarter	2,636,305	\$ 284.49	2,636,305	\$ 2,500

(1) On September 7, 2018, the Board of Directors authorized the repurchase of up to \$2.00 billion of the company's common stock. All of the shares of common stock repurchased by the company during the fourth quarter of 2019 were purchased under this program. On November 8, 2019, the Board of Directors replaced the existing authorization to repurchase the company's common stock, of which \$500 million was remaining, with a new authorization to repurchase up to \$2.50 billion of the company's common stock. At February 26, 2020, authorization remained for \$1.00 billion of future repurchases of the company's common stock.

Item 6. Selected Financial Data

(In millions except per share amounts)	2019 (a)	2018 (b)	2017 (c)	2016 (d)	2015 (e)
Statement of Income Data					
Revenues	\$ 25,542	\$ 24,358	\$ 20,918	\$ 18,274	\$ 16,965
Income from Continuing Operations	3,696	2,938	2,228	2,025	1,980
Net Income	3,696	2,938	2,225	2,022	1,975
Earnings per Share from Continuing Operations:					
Basic	9.24	7.31	5.65	5.13	4.97
Diluted	9.17	7.24	5.60	5.10	4.93
Earnings per Share:					
Basic	9.24	7.31	5.64	5.12	4.96
Diluted	9.17	7.24	5.59	5.09	4.92
Balance Sheet Data					
Total Assets	\$ 58,381	\$ 56,232	\$ 56,669	\$ 45,908	\$ 40,834
Long-term Obligations	17,076	17,719	18,873	15,372	11,420
Cash Dividend Declared per Common Share	\$ 0.76	\$ 0.68	\$ 0.60	\$ 0.60	\$ 0.60

The caption "restructuring and other costs/income" in the notes below includes amounts charged to cost of revenues, primarily for the sale of inventories revalued at the date of acquisition, and charges/credits to selling, general and administrative expense primarily for significant acquisition transaction costs.

- (a) Reflects \$334 million of pre-tax income from gains on sale of businesses, net of restructuring and other costs and \$184 million of pre-tax losses on the early extinguishment of debt.
- (b) Reflects \$91 million of pre-tax charges for restructuring and other costs.
- (c) Reflects \$298 million of pre-tax charges for restructuring and other costs. Also reflects the acquisition of Patheon N.V. in August 2017.
- (d) Reflects \$395 million of pre-tax charges for restructuring and other costs. Also reflects the acquisitions of Affymetrix, Inc. in March 2016 and FEI Company in September 2016.
- (e) Reflects \$171 million of pre-tax charges for restructuring and other costs.

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

Reference is made throughout this Management's Discussion and Analysis of Financial Condition and Results of Operations to Notes to the [Consolidated Financial Statements](#), which begin on page F-1 of this report. Management's discussion and analysis of financial condition and results of operations for 2017 is included in Item 7 of the company's 2018 [Annual Report on Form 10-K](#) filed with the Securities and Exchange Commission.

Overview

The company develops, manufactures and sells a broad range of products that are sold worldwide. The company expands the product lines and services it offers by developing and commercializing its own technologies and by making strategic acquisitions of complementary businesses. The company's operations fall into four segments (see Note 4): Life Sciences Solutions, Analytical Instruments, Specialty Diagnostics and Laboratory Products and Services.

Recent Acquisitions and Divestiture

The company's strategy is to augment internal growth at existing businesses with complementary acquisitions. The company's principal recent acquisitions and divestiture are described below.

On October 25, 2018, the company acquired, within the Life Sciences Solutions segment, Becton Dickinson and Company's Advanced Bioprocessing business for \$477 million in cash. This North America-based business adds complementary cell culture products that expand the segment's bioproduction offerings to help customers increase yield during production of biologic drugs. The Advanced Bioprocessing business reported revenues of \$100 million in 2017.

On April 30, 2019, the company acquired, within the Laboratory Products and Services segment, Brammer Bio for approximately \$1.67 billion in cash. Brammer Bio is a leading viral vector contract development and manufacturing organization for gene and cell therapies. The acquisition expands the segment's contract manufacturing capabilities. Brammer Bio reported revenues of approximately \$140 million in 2018.

On June 28, 2019, the company sold its Anatomical Pathology business to PHC Holdings Corporation for \$1.13 billion, net of cash divested. The business was part of the Specialty Diagnostics segment. The sale of this business resulted in a pre-tax gain of approximately \$478 million, included in restructuring and other (income) costs, net. Revenues in 2019, through the date of sale, and the full year 2018 of the business sold were approximately \$115 million and \$238 million, respectively, net of retained sales through the company's healthcare market and research and safety market channel businesses.

Overview of Results of Operations and Liquidity

(Dollars in millions)

	2019		2018	
Revenues				
Life Sciences Solutions	\$ 6,856	26.8 %	\$ 6,269	25.7 %
Analytical Instruments	5,522	21.6 %	5,469	22.5 %
Specialty Diagnostics	3,718	14.6 %	3,724	15.3 %
Laboratory Products and Services	10,599	41.5 %	10,035	41.2 %
Eliminations	(1,153)	(4.5)%	(1,139)	(4.7)%
	<u>\$ 25,542</u>	<u>100 %</u>	<u>\$ 24,358</u>	<u>100 %</u>

Sales in 2019 were \$25.54 billion, an increase of \$1.18 billion from 2018. Sales increased \$153 million due to acquisitions, net of a divestiture. The unfavorable effects of currency translation resulted in a decrease in revenues of \$440 million in 2019. Aside from the effects of acquisitions/divestitures and currency translation, revenues increased \$1.47 billion (6%) primarily due to increased demand. Sales to customers in each of the company's primary end markets grew with particular strength in sales to customers in the biotech and pharmaceutical industry. Sales growth was strong in each of the company's primary geographic areas in 2019. In the fourth quarter of 2019, sales to industrial customers declined and sales growth in Asia was modest due to weaker end market conditions off of a strong fourth quarter in 2018.

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Overview of Results of Operations and Liquidity (continued)

In 2019, total company operating income and operating income margin were \$4.59 billion and 18.0%, respectively, compared with \$3.78 billion and 15.5%, respectively, in 2018. The increase in operating income was primarily due to profit on higher sales, the gain on the sale of the Anatomical Pathology business and, to a lesser extent, productivity improvements, net of inflationary cost increases. These increases were offset in part by strategic growth investments, sales mix and unfavorable foreign currency exchange. The company's references to strategic growth investments generally refer to targeted spending for enhancing commercial capabilities, including expansion of geographic sales reach and e-commerce platforms, marketing initiatives, expanded service and operational infrastructure, focused research projects and other expenditures to enhance the customer experience. The company's references throughout this discussion to productivity improvements generally refer to improved cost efficiencies from its Practical Process Improvement (PPI) business system, reduced costs resulting from global sourcing initiatives, a lower cost structure following restructuring actions, including headcount reductions and consolidation of facilities, and low cost region manufacturing.

The company recorded a \$374 million provision for income taxes in 2019 including \$191 million related to the gain on the sale of the Anatomical Pathology business. In 2019, the company recorded a \$62 million income tax benefit related to a foreign exchange loss for tax purposes on certain intercompany financing arrangements, implemented foreign tax credit planning in Sweden which resulted in \$75 million of foreign tax credits, with no related incremental U.S. income tax expense, and recorded a \$79 million income tax benefit related to the deferred tax implications of intra-entity transactions which included a tax benefit to release a valuation allowance against net operating losses previously determined to be unrealizable.

The company recorded a \$324 million provision for income taxes in 2018 including a net provision of \$68 million to adjust the estimated initial effects of the Tax Cuts and Jobs Act of 2017 (the Tax Act) recorded in 2017, consisting of an incremental provision of \$117 million offset in part by a \$49 million reduction of related unrecognized tax benefits established in 2017. These adjustments were required based on new U.S. Treasury guidance and further analysis of available tax accounting methods and elections, legislative updates, regulations, earnings and profit computations and foreign taxes. In 2018, the provision for income taxes also included a \$71 million charge to establish a valuation allowance against net operating losses that will not be utilized as a result of the 2019 sale of the Anatomical Pathology business.

The effective tax rate in both 2019 and 2018 was also affected by relatively significant earnings in lower tax jurisdictions. Due primarily to the non-deductibility of intangible asset amortization for tax purposes, the company's cash payments for income taxes were higher than its income tax expense for financial reporting purposes and totaled \$896 million and \$591 million in 2019 and 2018, respectively.

The company expects its effective tax rate in 2020 will be between 8% and 10% based on currently forecasted rates of profitability in the countries in which the company conducts business and expected generation of foreign tax credits. The effective tax rate can vary significantly from period to period as a result of discrete income tax factors and events.

Income from continuing operations increased to \$3.70 billion in 2019, from \$2.94 billion in 2018 principally due to increase in operating income in 2019 (discussed above) offset in part by \$184 million of losses on the early extinguishment of debt in 2019 (Note 10).

During 2019, the company's cash flow from operations totaled \$4.97 billion compared with \$4.54 billion for 2018. The increase primarily resulted from higher income before amortization and depreciation and lower investment in working capital in the 2019 period.

As of December 31, 2019, the company's short-term debt totaled \$676 million, including \$672 million of senior notes due within the next twelve months. The company has a revolving credit facility with a bank group that provides up to \$2.50 billion of unsecured multi-currency revolving credit. If the company borrows under this facility, it intends to leave undrawn an amount equivalent to outstanding commercial paper to provide a source of funds in the event that commercial paper markets are not available. As of December 31, 2019, no borrowings were outstanding under the company's revolving credit facility, although available capacity was reduced by approximately \$72 million as a result of outstanding letters of credit.

The company believes that its existing cash and cash equivalents of \$2.40 billion as of December 31, 2019 and its future cash flow from operations together with available borrowing capacity under its revolving credit agreement will be sufficient to meet the cash requirements of its existing businesses for the foreseeable future, including at least the next 24 months.

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MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION
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Critical Accounting Policies and Estimates

The company's discussion and analysis of its financial condition and results of operations is based upon its financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States of America. The preparation of these financial statements requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenue and expenses and related disclosure of contingent liabilities. On an on-going basis, management evaluates its estimates, including those related to intangible assets and goodwill, income taxes and contingencies and litigation. Management believes the most complex and sensitive judgments, because of their significance to the consolidated financial statements, result primarily from the need to make estimates about the effects of matters that are inherently uncertain. Management bases its estimates on historical experience, current market and economic conditions and other assumptions that management believes are reasonable. The results of these estimates form the basis for judgments about the carrying value of assets and liabilities where the values are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

The company believes the following represent its critical accounting policies and estimates used in the preparation of its financial statements:

(a) *Intangible Assets and Goodwill*

The company uses assumptions and estimates in determining the fair value of assets acquired and liabilities assumed in a business combination. The determination of the fair value of intangible assets, which represent a significant portion of the purchase price in many of the company's acquisitions, requires the use of significant judgment with regard to (i) the fair value; and (ii) whether such intangibles are amortizable or non-amortizable and, if the former, the period and the method by which the intangible asset will be amortized. The company estimates the fair value of acquisition-related intangible assets principally based on projections of cash flows that will arise from identifiable intangible assets of acquired businesses. The projected cash flows are discounted to determine the present value of the assets at the dates of acquisition. Definite-lived intangible assets totaled \$12.76 billion at December 31, 2019. The company reviews definite-lived intangible assets for impairment when indication of potential impairment exists, such as a significant reduction in cash flows associated with the assets. Actual cash flows arising from a particular intangible asset could vary from projected cash flows which could imply different carrying values from those established at the dates of acquisition and which could result in impairment of such asset.

The company evaluates goodwill and indefinite-lived intangible assets for impairment annually and when events occur or circumstances change that would more-likely-than-not reduce the fair value of the asset below its carrying amount. Events or circumstances that might require an interim evaluation include unexpected adverse business conditions, economic factors, unanticipated technological changes or competitive activities, loss of key personnel and acts by governments and courts. Goodwill and indefinite-lived intangible assets totaled \$25.71 billion and \$1.25 billion, respectively, at December 31, 2019. Estimates of discounted future cash flows require assumptions related to revenue and operating income growth rates, discount rates and other factors. For the goodwill impairment tests, the company considers (i) peer revenues and earnings trading multiples from companies that have operational and financial characteristics that are similar to the respective reporting units and (ii) estimated weighted average costs of capital. Different assumptions from those made in the company's analysis could materially affect projected cash flows and the company's evaluation of goodwill and indefinite-lived intangible assets for impairment.

For reporting units where the company performed the quantitative goodwill impairment test, indications of fair value based on projections of profitability and on peer revenues and earnings trading multiples were sufficient to conclude that no impairment of goodwill or indefinite-lived intangible assets existed at the end of the tenth fiscal month of 2019, the date of the company's annual impairment testing. There can be no assurance, however, that an economic downturn will not materially adversely affect peer trading multiples and the company's businesses such that they do not achieve their forecasted profitability and these assets become impaired. Should the fair value of the company's goodwill or indefinite-lived intangible assets decline because of reduced operating performance, market declines, or other indicators of impairment, or as a result of changes in the discount rate, charges for impairment may be necessary.

(b) *Income Taxes*

In the ordinary course of business there is inherent uncertainty in quantifying the company's income tax positions. The company assesses income tax positions and records tax benefits for all years subject to examination based upon management's evaluation of the facts, circumstances and information available at the reporting date. For those tax

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Critical Accounting Policies and Estimates (continued)

positions where it is more likely than not that a tax benefit will be sustained, the company has recorded the largest amount of tax benefit with a greater than 50 percent likelihood of being realized upon ultimate settlement with a taxing authority that has full knowledge of all relevant information. For those income tax positions where it is not more likely than not that a tax benefit will be sustained, no tax benefit has been recognized in the financial statements. Should tax return positions that the company expects are sustainable not be sustained upon audit, the company could be required to record an incremental tax provision for such taxes. The company's liability for these unrecognized tax benefits totaled \$1.55 billion at December 31, 2019.

The company operates in numerous countries under many legal forms and, as a result, is subject to the jurisdiction of numerous domestic and non-U.S. tax authorities, as well as to tax agreements and treaties among these governments. Determination of taxable income in any jurisdiction requires the company to interpret the related tax laws and regulations and the use of estimates and assumptions regarding significant future events, such as the amount, timing and character of deductions, permissible revenue recognition methods under the tax law and the sources and character of income and tax credits. Changes in tax laws, regulations, agreements and treaties, currency exchange restrictions or the company's level of operations or profitability in each taxing jurisdiction could have an impact upon the amount of current and deferred tax balances and hence the company's net income.

The company estimates the degree to which tax assets will result in a benefit, after consideration of all positive and negative evidence, and provides a valuation allowance for tax assets that it believes will more likely than not go unused. In situations in which the company has been able to determine that its deferred tax assets will be realized, that determination generally relies on future reversals of taxable temporary differences and expected future taxable income. If it becomes more likely than not that a tax asset will be used, the company reverses the related valuation allowance. Any such reversals are recorded as a reduction of the company's tax provision. The company's tax valuation allowance totaled \$408 million at December 31, 2019. Should the company's actual future taxable income by tax jurisdiction vary from estimates, additional allowances or reversals thereof may be necessary.

The company has not provided U.S. state income taxes or additional non-U.S. taxes on certain of its non-U.S. subsidiaries' undistributed earnings, as such amounts are intended to be reinvested outside the United States indefinitely in the respective jurisdictions based on specific business plans and tax strategies. These business plans and tax strategies consider: short-term and long-term forecasts and budgets of the U.S. parent and non-U.S. subsidiaries; working capital and other needs in locations where earnings are generated; the company's past practices regarding non-U.S. subsidiary dividends; sources of financing by the U.S. parent, such as issuing debt or equity; and uses of cash by the U.S. parent that are more discretionary in nature, such as business combinations and share repurchase programs. However, should the company change its business plans and tax strategies in the future and decide to repatriate a portion of these earnings to one of its U.S. subsidiaries, including cash maintained by these non-U.S. subsidiaries, the company would recognize additional tax liabilities. It is not practicable to estimate the amount of additional U.S. state income tax and non-U.S. tax liabilities that the company would incur. The company's intent is to only make distributions from non-U.S. subsidiaries in the future when they can be made at no net tax costs.

(c) Contingencies and Litigation

The company records accruals for various contingencies, including legal proceedings, environmental, workers' compensation, product, general and auto liabilities, and other claims that arise in the normal course of business. The accruals are based on management's judgment, historical claims experience, the probability of losses and, where applicable, the consideration of opinions of internal and/or external legal counsel and actuarial estimates. Accruals of acquired businesses, including product liability and environmental accruals, are initially recorded at fair value and discounted to their net present value. Additionally, the company records receivables from third-party insurers when recovery has been determined to be probable.

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MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION
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Results of Operations

2019 Compared With 2018

(In millions)	2019	2018	Total Change	Currency Translation / Other *	Acquisitions/Divestitures	Operations
Revenues						
Life Sciences Solutions	\$ 6,856	\$ 6,269	\$ 587	\$ (122)	\$ 89	\$ 620
Analytical Instruments	5,522	5,469	53	(96)	—	149
Specialty Diagnostics	3,718	3,724	(6)	(66)	(126)	186
Laboratory Products and Services	10,599	10,035	564	(227)	187	604
Eliminations	(1,153)	(1,139)	(14)	71	3	(88)
Consolidated Revenues	\$ 25,542	\$ 24,358	\$ 1,184	\$ (440)	\$ 153	\$ 1,471

* Currency Translation/Other for the Laboratory Products and Services segment includes a reduction of revenue of \$60 million for the impact of a change in the method of reporting certain intersegment sales with no impact on consolidated results.

Sales in 2019 were \$25.54 billion, an increase of \$1.18 billion from 2018. Sales increased \$153 million due to acquisitions. The unfavorable effects of currency translation resulted in a decrease in revenues of \$440 million in 2019. Aside from the effects of acquisitions and currency translation, revenues increased \$1.47 billion (6%) primarily due to increased demand. Sales to customers in each of the company's primary end markets grew with particular strength in sales to customers in the biotech and pharmaceutical industry. Sales growth was strong in each of the company's primary geographic areas in 2019. In the fourth quarter of 2019, sales to industrial customers declined and sales growth in Asia was modest due to weaker end market conditions off of a strong fourth quarter in 2018.

In 2019, total company operating income and operating income margin were \$4.59 billion and 18.0%, respectively, compared with \$3.78 billion and 15.5%, respectively, in 2018. The increase in operating income was primarily due to profit on higher sales, the gain on the sale of the Anatomical Pathology business and, to a lesser extent, productivity improvements, net of inflationary cost increases. These increases were offset in part by strategic growth investments, sales mix and unfavorable foreign currency exchange.

In 2019, the company recorded restructuring and other income, net, of \$334 million, including \$482 million of net gains on the sale of businesses, principally the Anatomical Pathology business (see Note 2). The company also recorded \$17 million of charges to cost of revenues primarily for the sale of inventories revalued at the date of acquisition, and \$62 million of net charges to selling, general and administrative expenses, principally transaction and integration-related costs related to acquisitions and a divestiture. In addition, the company recorded \$52 million of cash restructuring charges, net, primarily for employee severance and abandoned facilities costs associated with the closure and consolidation of facilities in the U.S. and Europe (see Note 16).

In 2018, the company recorded restructuring and other costs, net, of \$91 million, including \$12 million of charges to cost of revenues primarily for the sale of inventories revalued at the date of acquisition. The company recorded \$29 million of net charges to selling, general and administrative expenses, primarily for third-party transaction and integration costs associated with recent and pending acquisitions, offset in part by income from favorable results of product liability litigation. In addition, the company recorded \$88 million of cash restructuring costs, in its continued effort to streamline operations, including severance at several businesses and abandoned facility expenses at businesses that have been or are being consolidated in the U.S. and Europe. The company also recorded \$38 million of other income, net, principally for resolution of a litigation matter.

As of February 26, 2020, the company has identified restructuring actions that will result in additional charges of approximately \$65 million, primarily in 2020, and expects to identify additional actions during 2020 which will be recorded when specified criteria are met, such as communication of benefit arrangements or when the costs have been incurred. Approximately 25% of the additional charges will be incurred in the Life Sciences Solutions segment, 30% in the Analytical Instruments segment, 35% in the Laboratory Products and Services segment, and 10% in the Specialty Diagnostics segment. The restructuring projects for which charges were incurred in 2019 are expected to result in annual cost savings of approximately \$60 million beginning in part in 2019 and, to a greater extent, in 2020, including \$20 million in the Life Sciences Solutions segment, \$15 million in the Analytical Instruments segment, \$5 million in the Specialty Diagnostics segment and \$20

THERMO FISHER SCIENTIFIC INC.
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Results of Operations (continued)

million in the Laboratory Products and Services segment. The restructuring actions for which charges were incurred in 2018 resulted in annual cost savings of approximately \$65 million beginning in part in 2018 and to a greater extent in 2019, including \$20 million in the Life Sciences Solutions segment, \$10 million in the Analytical Instruments segment, \$5 million in the Specialty Diagnostics segment and \$30 million in the Laboratory Products and Services segment.

Segment Results

The company's management evaluates segment operating performance using operating income before certain charges/credits to cost of revenues and selling, general and administrative expenses, principally associated with acquisition-related activities; restructuring and other costs/income including costs arising from facility consolidations such as severance and abandoned lease expense and gains and losses from the sale of real estate and product lines; and amortization of acquisition-related intangible assets. The company uses this measure because it helps management understand and evaluate the segments' core operating results and facilitate comparison of performance for determining compensation (Note 4). Accordingly, the following segment data is reported on this basis.

(Dollars in millions)	2019	2018	Change
Revenues			
Life Sciences Solutions	\$ 6,856	\$ 6,269	9 %
Analytical Instruments	5,522	5,469	1 %
Specialty Diagnostics	3,718	3,724	— %
Laboratory Products and Services	10,599	10,035	6 %
Eliminations	(1,153)	(1,139)	1 %
Consolidated Revenues	\$ 25,542	\$ 24,358	5 %
Segment Income			
Life Sciences Solutions	\$ 2,446	\$ 2,158	13 %
Analytical Instruments	1,273	1,247	2 %
Specialty Diagnostics	930	952	(2) %
Laboratory Products and Services	1,324	1,258	5 %
Subtotal Reportable Segments	5,973	5,615	6 %
Cost of Revenues Charges	(17)	(12)	
Selling, General and Administrative Charges, Net	(62)	(29)	
Restructuring and Other (Costs) Income, Net	413	(50)	
Amortization of Acquisition-related Intangible Assets	(1,713)	(1,741)	
Consolidated Operating Income	\$ 4,594	\$ 3,783	21 %
Reportable Segments Operating Income Margin	23.4 %	23.1 %	
Consolidated Operating Income Margin	18.0 %	15.5 %	

Income from the company's reportable segments increased 6% to \$5.97 billion in 2019 due primarily to profit on higher sales and, to a lesser extent, productivity improvements, net of inflationary cost increases, offset in part by strategic growth investments, sales mix and unfavorable foreign currency exchange.

Life Sciences Solutions

(Dollars in millions)	2019	2018	Change
Revenues	\$ 6,856	\$ 6,269	9 %
Operating Income Margin	35.7 %	34.4 %	1.3 pt

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Sales in the Life Sciences Solutions segment increased \$587 million to \$6.86 billion in 2019. Sales increased \$620 million (10%) due to higher revenues at existing businesses and \$89 million due to an acquisition. The unfavorable effects of currency translation resulted in a decrease in revenues of \$122 million. The increase in revenue at existing businesses was primarily due to increased demand in each of the segment's principal businesses with particular strength in sales of bioproduction and biosciences products.

Operating income margin was 35.7% in 2019 compared to 34.4% in 2018. The increase in operating margin resulted primarily from profit on higher sales offset in part by strategic growth investments and, to a lesser extent, sales mix and unfavorable foreign currency exchange.

Analytical Instruments

(Dollars in millions)	2019	2018	Change
Revenues	\$ 5,522	\$ 5,469	1 %
Operating Income Margin	23.1 %	22.8 %	0.3 pt

Sales in the Analytical Instruments segment increased \$53 million to \$5.52 billion in 2019. Sales increased \$149 million (3%) due to higher revenues at existing businesses. The unfavorable effects of currency translation resulted in a decrease in revenues of \$96 million. The increase in revenue at existing businesses was due to increased demand for products sold by each of the segment's primary businesses with particular strength in chromatography and mass spectrometry instruments. Sales decreased in the fourth quarter of 2019 due to industrial end market conditions off of a strong fourth quarter of 2018.

Operating income margin was 23.1% in 2019 compared to 22.8% in 2018. The increase resulted primarily from profit on higher sales and productivity improvements, net of inflationary cost increases. These increases were offset in part by sales mix and strategic growth investments.

Specialty Diagnostics

(Dollars in millions)	2019	2018	Change
Revenues	\$ 3,718	\$ 3,724	— %
Operating Income Margin	25.0 %	25.6 %	-0.6 pt

Sales in the Specialty Diagnostics segment remained flat at \$3.72 billion in 2019. Sales increased \$186 million (5%) due to higher revenues at existing businesses. The unfavorable effects of currency translation resulted in a decrease in revenues of \$66 million and the divestiture of the Anatomical Pathology business decreased revenues by \$126 million. The increase in revenue at existing businesses was due to increased demand for products sold through the segment's healthcare market channel as well as clinical diagnostic and immunodiagnostic products.

Operating income margin was 25.0% in 2019 and 25.6% in 2018. The decrease was primarily due to strategic growth investments and, to a lesser extent, sales mix and the divestiture of the Anatomical Pathology business. These decreases were offset in part by profit on higher sales and, to a lesser extent, productivity improvements, net of inflationary cost increases. Following multi-year extensions of several expiring licensing arrangements with commercial partners, segment revenues and operating income in 2020 will both be unfavorably affected by approximately \$30 million.

Laboratory Products and Services

(Dollars in millions)	2019	2018	Change
Revenues	\$ 10,599	\$ 10,035	6 %
Operating Income Margin	12.5 %	12.5 %	0 pt

Sales in the Laboratory Products and Services segment increased \$564 million to \$10.60 billion in 2019. Sales increased \$604 million (6%) due to higher revenues at existing businesses and \$187 million due to acquisitions. The unfavorable effects of currency translation resulted in a decrease in revenues of \$167 million. A change in the method of reporting certain intersegment sales reduced segment revenues by \$60 million with no impact to consolidated results. The increase in revenue at

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Results of Operations (continued)

existing businesses was primarily due to increased demand in each of the segment's principal businesses with particular strength in service offerings of its pharma services business and products sold through its research and safety market channel business.

Operating income margin was 12.5% in both 2019 and 2018. Increases from profit on higher sales and productivity improvements, net of inflationary cost increases, were offset by strategic growth investments and, to a lesser extent, sales mix.

Other Expense/Income, Net

In 2019, the company recorded \$184 million of losses on the early extinguishment of debt, offset in part by \$44 million of net gains on investments. The investment gains include a \$28 million gain on the sale of a joint venture for net proceeds of \$42 million. In 2018, the company recorded \$15 million of net losses on investments.

Provision for Income Taxes

The company recorded a \$374 million provision for income taxes in 2019 including \$191 million related to the gain on the sale of the Anatomical Pathology business. In 2019, the company recorded a \$62 million income tax benefit related to a foreign exchange loss for tax purposes on certain intercompany financing arrangements, implemented foreign tax credit planning in Sweden which resulted in \$75 million of foreign tax credits, with no related incremental U.S. income tax expense, and recorded a \$79 million income tax benefit related to the deferred tax implications of intra-entity transactions which included a tax benefit to release a valuation allowance against net operating losses previously determined to be unrealizable.

The company recorded a \$324 million provision for income taxes in 2018 including a net provision of \$68 million to adjust the estimated initial effects of the Tax Cuts and Jobs Act of 2017 recorded in 2017, consisting of an incremental provision of \$117 million offset in part by a \$49 million reduction of related unrecognized tax benefits established in 2017. These adjustments were required based on new U.S. Treasury guidance and further analysis of available tax accounting methods and elections, legislative updates, regulations, earnings and profit computations and foreign taxes. In 2018, the provision for income taxes also included a \$71 million charge to establish a valuation allowance against net operating losses that will not be utilized as a result of the 2019 sale of the Anatomical Pathology business.

The effective tax rate in both 2019 and 2018 was also affected by relatively significant earnings in lower tax jurisdictions. Due primarily to the non-deductibility of intangible asset amortization for tax purposes, the company's cash payments for income taxes were higher than its income tax expense for financial reporting purposes and totaled \$896 million and \$591 million in 2019 and 2018, respectively.

The company expects its effective tax rate in 2020 will be between 8% and 10% based on currently forecasted rates of profitability in the countries in which the company conducts business and expected generation of foreign tax credits. The effective tax rate can vary significantly from period to period as a result of discrete income tax factors and events.

The company has operations and a taxable presence in approximately 50 countries outside the U.S. Some of these countries have lower tax rates than the U.S. The company's ability to obtain a benefit from lower tax rates outside the U.S. is dependent on its relative levels of income in countries outside the U.S. and on the statutory tax rates in those countries. Based on the dispersion of the company's non-U.S. income tax provision among many countries, the company believes that a change in the statutory tax rate in any individual country is not likely to materially affect the company's income tax provision or net income, aside from any resulting one-time adjustment to the company's deferred tax balances to reflect a new rate.

Recent Accounting Pronouncements

A description of recently issued accounting standards is included under the heading "*Recent Accounting Pronouncements*" in Note 1.

Contingent Liabilities

The company is contingently liable with respect to certain legal proceedings and related matters. An unfavorable outcome that differs materially from current accrual estimates, if any, for one or more of the matters described under the headings "*Product Liability, Workers Compensation and Other Personal Injury Matters*," and "*Intellectual Property Matters*" in Note 12 could have a material adverse effect on the company's financial position as well as its results of operations and cash flows.

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Liquidity and Capital Resources

Consolidated working capital (current assets less current liabilities) was \$5.70 billion at December 31, 2019, compared with \$4.48 billion at December 31, 2018, primarily due to lower short-term debt and higher cash balances. Included in working capital were cash and cash equivalents of \$2.40 billion at December 31, 2019 and \$2.10 billion at December 31, 2018.

2019

Cash provided by operating activities was \$4.97 billion during 2019. Cash provided by income was offset in part by increased investments in working capital. Increases in accounts receivable and inventories used cash of \$225 million and \$458 million, respectively, primarily to support growth in sales. An increase in other assets used cash of \$408 million primarily due to the timing of customer billings and tax refunds. Other liabilities increased by \$210 million primarily due to advance payments from customers. Cash payments for income taxes increased to \$896 million during 2019, compared with \$591 million in 2018. The company made cash contributions to its pension and postretirement benefit plans totaling \$50 million during 2019. Payments for restructuring actions, principally severance costs and lease and other expenses of real estate consolidation, used cash of \$69 million during 2019.

During 2019, the company's investing activities used \$1.49 billion of cash. Acquisitions used cash of \$1.84 billion. Proceeds from the sale of the Anatomical Pathology business provided \$1.13 billion. The company's investing activities also included the purchase of \$926 million of property, plant and equipment.

The company's financing activities used \$3.12 billion of cash during 2019. Repayment of senior notes used cash of \$6.36 billion. New long-term borrowings provided cash of \$5.64 billion. A net decrease in commercial paper obligations used cash of \$683 million. The company's financing activities also included the repurchase of \$1.50 billion of the company's common stock and the payment of \$297 million in cash dividends, offset in part by \$153 million of net proceeds from employee stock option exercises. On November 8, 2019, the Board of Directors replaced the existing authorization to repurchase the company's common stock, of which \$500 million was remaining, with a new authorization to repurchase up to \$2.50 billion of the company's common stock. At February 26, 2020, authorization remained for \$1.00 billion of future repurchases of the company's common stock.

As of December 31, 2019, the company's short-term debt totaled \$676 million, including \$672 million of senior notes due within the next twelve months. The company has a revolving credit facility with a bank group that provides up to \$2.50 billion of unsecured multi-currency revolving credit. If the company borrows under this facility, it intends to leave undrawn an amount equivalent to outstanding commercial paper to provide a source of funds in the event that commercial paper markets are not available. As of December 31, 2019, no borrowings were outstanding under the company's revolving credit facility, although available capacity was reduced by approximately \$72 million as a result of outstanding letters of credit.

Approximately half of the company's cash balances and cash flows from operations are from outside the U.S. The company uses its non-U.S. cash for needs outside of the U.S. including acquisitions and repayment of acquisition-related intercompany debt to the U.S. In addition, the company also transfers cash to the U.S. using non-taxable returns of capital as well as dividends where the related U.S. dividend received deduction or foreign tax credit equals any tax cost arising from the dividends. As a result of using such means of transferring cash to the U.S., the company does not expect any material adverse liquidity effects from its significant non-U.S. cash balances for the foreseeable future.

The company believes that its existing cash and cash equivalents of \$2.40 billion as of December 31, 2019 and its future cash flow from operations together with available borrowing capacity under its revolving credit agreement will be sufficient to meet the cash requirements of its existing businesses for the foreseeable future, including at least the next 24 months.

2018

Cash provided by operating activities was \$4.54 billion during 2018. Cash provided by income was offset in part by investments in working capital. Increases in accounts receivable and inventories used cash of \$366 million and \$324 million, respectively, primarily to support growth in sales. Cash payments for income taxes increased to \$591 million during 2018, compared with \$479 million in 2017. The company made cash contributions to its pension and postretirement benefit plans totaling \$93 million during 2018. Payments for restructuring actions, principally severance costs and lease and other expenses of real estate consolidation, used cash of \$83 million during 2018.

During 2018, the company's investing activities used \$1.25 billion of cash. Acquisitions used cash of \$536 million. The company's investing activities also included the purchase of \$758 million of property, plant and equipment.

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Liquidity and Capital Resources (continued)

The company's financing activities used \$2.24 billion of cash during 2018. Repayment of senior notes used cash of \$2.05 billion. New long-term borrowings provided cash of \$690 million. A net decrease in commercial paper obligations used cash of \$194 million. The company's financing activities also included the repurchase of \$500 million of the company's common stock and the payment of \$266 million in cash dividends, offset in part by \$136 million of net proceeds from employee stock option exercises.

Off-Balance Sheet Arrangements

The company did not use special purpose entities or other off-balance-sheet financing arrangements in 2017, 2018 or 2019, except for letters of credit, bank guarantees, residual value guarantees under three lease agreements, surety bonds and other guarantees disclosed in the table or discussed below. The amounts disclosed in the table below for letters of credit, bank guarantees, surety bonds and other guarantees relate to guarantees of the company's performance, primarily in the ordinary course of business.

Contractual Obligations and Other Commercial Commitments

The table below summarizes, by period due or expiration of commitment, the company's contractual obligations and other commercial commitments as of December 31, 2019.

(In millions)	Payments due by Period or Expiration of Commitment				Total
	2020	2021 and 2022	2023 and 2024	2025 and Thereafter	
Contractual Obligations and Other Commercial Commitments					
Debt principal, including short-term debt (a)	\$ 673	\$ 562	\$ 3,122	\$ 13,593	\$ 17,950
Finance lease obligations	3	6	1	—	10
Interest	371	742	652	2,694	4,459
Operating lease obligations	197	282	160	197	836
Unconditional purchase obligations (b)	830	283	86	4	1,203
Letters of credit and bank guarantees	232	23	9	8	272
Surety bonds and other guarantees	45	16	—	—	61
Pension obligations on balance sheet	42	91	100	336	569
Asset retirement obligations accrued on balance sheet	7	14	5	15	41
Acquisition-related contingent consideration accrued on balance sheet	11	20	8	16	55
	\$ 2,411	\$ 2,039	\$ 4,143	\$ 16,863	\$ 25,456

(a) Amounts represent the expected cash payments for debt and do not include any deferred issuance costs.

(b) Unconditional purchase obligations include agreements to purchase goods, services or fixed assets that are enforceable and legally binding and that specify all significant terms, including: fixed or minimum quantities to be purchased; fixed, minimum or variable price provisions; and the approximate timing of the transaction. Purchase obligations exclude agreements that are cancelable at any time without penalty.

Reserves for unrecognized tax benefits of \$1.55 billion have not been included in the above table due to the inability to predict the timing of tax audit resolutions.

The company has no material commitments for purchases of property, plant and equipment, other than those included in the above table, but expects that for 2020, such expenditures will be between \$1 and \$1.1 billion.

Guarantees of residual value under lease arrangements for three facilities have not been included in the above table due to the inability to predict if and when the guarantees may require payment (see Note 11). The residual value guarantees become operative at the end of the leases for up to a maximum of \$147 million. The terms of these leases end in 2020, 2023 and 2024.

A guarantee of pension plan obligations of a divested business has not been included in the preceding table due to the inability to predict if and when the guarantee may require payment. The purchaser of the divested business has agreed to pay for the pension benefits, however the company was required to guarantee payment of these pension benefits should the purchaser fail to do so. The amount of the guarantee at December 31, 2019 was \$41 million.

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Liquidity and Capital Resources (continued)

In disposing of assets or businesses, the company often provides representations, warranties and/or indemnities to cover various risks including, for example, unknown damage to the assets, environmental risks involved in the sale of real estate, liability to investigate and remediate environmental contamination at waste facilities, and unidentified tax liabilities and related legal fees. The company does not have the ability to estimate the potential liability from such indemnities because they relate to unknown conditions. However, the company has no reason to believe that these uncertainties would have a material adverse effect on its financial position, annual results of operations or cash flows.

The company has recorded liabilities for known indemnifications included as part of environmental liabilities. See [Item 1. Business](#) – Environmental Matters for a discussion of these liabilities.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

The company is exposed to market risk from changes in interest rates and currency exchange rates, which could affect its future results of operations and financial condition. The company manages its exposure to these risks through its regular operating and financing activities. The company has periodically hedged interest rate risks of fixed-rate instruments with offsetting interest rate swaps. Additionally, the company uses short-term forward and option contracts primarily to hedge certain balance sheet and operational exposures resulting from changes in currency exchange rates. Such exposures result from purchases, sales, cash and intercompany loans that are denominated in currencies other than the functional currencies of the respective operations. The currency-exchange contracts principally hedge transactions denominated in Swiss franc, euro, Canadian dollars, Swedish kronor, British pounds sterling, Japanese yen and Czech koruna. Income and losses arising from these derivative contracts are recognized as offsets to losses and income resulting from the underlying exposure being hedged. The company does not enter into speculative derivative agreements.

Interest Rates

The company is exposed to changes in interest rates while conducting normal business operations as a result of ongoing investing and financing activities, which affect the company's debt as well as cash and cash equivalents. As of December 31, 2019, the company's debt portfolio was comprised primarily of fixed rate borrowings. The fair market value of the company's fixed interest rate debt is subject to interest rate risk. Generally, the fair market value of fixed interest rate debt will increase as interest rates fall and decrease as interest rates rise. The total estimated fair value of the company's debt at December 31, 2019 was \$18.67 billion (see Note 14). Fair values were determined from available market prices using current interest rates and terms to maturity. If interest rates were to decrease by 100 basis points, the fair value of the company's debt at December 31, 2019 would increase by approximately \$1.49 billion. If interest rates were to increase by 100 basis points, the fair value of the company's debt at December 31, 2019 would decrease by approximately \$1.50 billion.

In addition, interest rate changes would result in a change in the company's interest expense due to variable-rate debt instruments including swap arrangements. In 2019, a 100 basis point increase in interest rates on the swap arrangements and variable-rate debt would have increased the company's annual pre-tax interest expense by approximately \$16 million.

Currency Exchange Rates

The company views its investment in international subsidiaries with a functional currency other than the U.S. dollar as permanent. The company's investment in international subsidiaries is sensitive to fluctuations in currency exchange rates. The functional currencies of the company's international subsidiaries are principally denominated in British pounds sterling, Swedish kronor, euro, Canadian dollars, Swiss franc, Norwegian kroner and Danish kroner. The effect of a change in the period ending currency exchange rates on the company's net investment in international subsidiaries is reflected in the "accumulated other comprehensive items" component of shareholders' equity. The company also uses foreign currency-denominated debt to partially hedge its net investments in foreign operations against adverse movements in exchange rates. A 10% depreciation in year-end 2019 functional currencies, relative to the U.S. dollar, would result in a reduction of shareholders' equity of \$1.14 billion.

The fair value of forward currency-exchange contracts is sensitive to changes in currency exchange rates. The fair value of forward currency-exchange contracts is the estimated amount that the company would pay or receive upon termination of the contract, taking into account the change in currency exchange rates. A 10% depreciation in year-end 2019 non-functional currency exchange rates related to the company's contracts would result in an additional unrealized loss on forward currency-exchange contracts of \$243 million. A 10% appreciation in year-end 2019 non-functional currency exchange rates related to the company's contracts would result in an unrealized gain on forward currency-exchange contracts of \$203 million. The

Quantitative and Qualitative Disclosures About Market Risk (continued)

unrealized gains or losses on forward currency-exchange contracts resulting from changes in currency exchange rates are expected to approximately offset losses or gains on the exposures being hedged.

Certain of the company's cash and cash equivalents are denominated in currencies other than the functional currency of the depositor and are sensitive to changes in currency exchange rates. A 10% depreciation in the related year-end 2019 non-functional currency exchange rates applied to such cash balances would result in a negative impact of \$32 million on the company's net income.

Item 8. Financial Statements and Supplementary Data

This data is submitted as a separate section to this report. See [Item 15 "Exhibits and Financial Statement Schedules."](#)

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

Not applicable.

Item 9A. Controls and Procedures

Management's Evaluation of Disclosure Controls and Procedures

The company's management, with the participation of the company's chief executive officer and chief financial officer, has evaluated the effectiveness of the company's disclosure controls and procedures (as such term is defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) as of the end of the period covered by this report. Based on such evaluation, the company's chief executive officer and chief financial officer concluded that, as of the end of such period, the company's disclosure controls and procedures were effective at the reasonable assurance level.

Changes in Internal Control over Financial Reporting

There have been no changes in the company's internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) during the fiscal quarter ended December 31, 2019, that have materially affected or are reasonably likely to materially affect the company's internal control over financial reporting.

Management's Annual Report on Internal Control Over Financial Reporting

The company's management, including the company's chief executive officer and chief financial officer, is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company. 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. The company's management conducted an assessment of the effectiveness of the company's internal control over financial reporting as of December 31, 2019 based on criteria established in "Internal Control - Integrated Framework" (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this assessment, the company's management concluded that, as of December 31, 2019, the company's internal control over financial reporting was effective.

The company's independent registered public accounting firm, PricewaterhouseCoopers LLP, has audited the effectiveness of the company's internal control over financial reporting as of December 31, 2019, as stated in their report that appears on page F-2 of this Annual Report on Form 10-K.

Item 9B. Other Information

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information with respect to directors required by this Item will be contained in our definitive proxy statement to be filed with the SEC not later than 120 days after the close of business of the fiscal year (2020 Definitive Proxy Statement) and is incorporated in this report by reference.

The information with respect to executive officers required by this Item is included in [Item 1 of Part I](#) of this report.

The other information required by this Item will be contained in our 2020 Definitive Proxy Statement and is incorporated in this report by reference.

Item 11. Executive Compensation

The information required by this Item will be contained in our 2020 Definitive Proxy Statement and is incorporated in this report by reference.

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

The information required by this Item will be contained in our 2020 Definitive Proxy Statement and is incorporated in this report by reference.

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

The information required by this Item will be contained in our 2020 Definitive Proxy Statement and is incorporated in this report by reference.

Item 14. Principal Accountant Fees and Services

The information required by this Item will be contained in our 2020 Definitive Proxy Statement and is incorporated in this report by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) The following documents are filed as part of this report:

(1) Consolidated Financial Statements (see Index on page F-1 of this report)

[Report of Independent Registered Public Accounting Firm](#)

[Consolidated Balance Sheet](#)

[Consolidated Statement of Income](#)

[Consolidated Statement of Comprehensive Income](#)

[Consolidated Statement of Cash Flows](#)

[Consolidated Statement of Shareholders' Equity](#)

[Notes to Consolidated Financial Statements](#)

(2) All schedules are omitted because they are not applicable or not required, or because the required information is included either in the consolidated financial statements or in the notes thereto.

(b) Exhibits

See the Exhibit Index on page 37.

Item 16. Form 10-K Summary

None.

SIGNATURES

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

Date: February 26, 2020

THERMO FISHER SCIENTIFIC INC.

By: /s/ Marc N. Casper

Marc N. Casper

Chairman, President and Chief Executive Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities indicated, as of February 26, 2020.

By: /s/ Marc N. Casper

Marc N. Casper

Chairman, President and Chief Executive Officer

(Principal Executive Officer)

By: /s/ Jim P. Manzi

Jim P. Manzi

Director

By: /s/ Stephen Williamson

Stephen Williamson

Senior Vice President and Chief Financial Officer

(Principal Financial Officer)

By: /s/ James C. Mullen

James C. Mullen

Director

By: /s/ Peter E. Hornstra

Peter E. Hornstra

Vice President and Chief Accounting Officer

(Principal Accounting Officer)

By: /s/ Lars R. Sørensen

Lars R. Sørensen

Director

By: /s/ Nelson J. Chai

Nelson J. Chai

Director

By: /s/ Debora L. Spar

Debora L. Spar

Director

By: /s/ C. Martin Harris

C. Martin Harris

Director

By: /s/ Scott M. Sperling

Scott M. Sperling

Director

By: /s/ Tyler E. Jacks

Tyler E. Jacks

Director

By: /s/ Elaine S. Ullian

Elaine S. Ullian

Director

By: /s/ Judy C. Lewent

Judy C. Lewent

Director

By: /s/ Dion J. Weisler

Dion J. Weisler

Director

By: /s/ Thomas J. Lynch

Thomas J. Lynch

Director

THERMO FISHER SCIENTIFIC INC.

EXHIBIT INDEX

Exhibit Number	Description of Exhibit
3.1	Amended and Restated Certificate of Incorporation of the Registrant (filed as Exhibit 3.1 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2005 [File No. 1-8002] and incorporated in this document by reference).
3.2	Amendment to Thermo Fisher Scientific Inc.'s Third Amended and Restated Certificate of Incorporation (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed November 14, 2006 [File No. 1-8002] and incorporated in this document by reference).
3.3	Certificate of Elimination of the Series B Junior Participating Preferred Stock of the Company, dated November 13, 2015 (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed November 16, 2015 [File No. 1-8002] and incorporated in this document by reference).
3.4	By-Laws of the Registrant, as amended and effective as of March 1, 2017 (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed March 2, 2017 [File No. 1-8002] and incorporated in this document by reference). <i>The Registrant agrees, pursuant to Item 601(b)(4)(iii)(A) of Regulation S-K, to furnish to the Commission, upon request, a copy of each instrument with respect to long-term debt of the Registrant or its consolidated subsidiaries.</i>
4.1	Indenture dated as of November 20, 2009 between the Company and The Bank of New York Mellon Trust Company, N.A. (filed as Exhibit 99.1 to the Registrant's Current Report on Form 8-K filed November 20, 2009 [File No. 1-8002] and incorporated in this document by reference).
4.2	Sixth Supplemental Indenture, dated as of December 11, 2013, between the Company and The Bank of New York Mellon Trust Company, N.A. (filed as Exhibit 99.2 to the Registrant's Current Report on Form 8-K filed December 11, 2013 [File No. 1-8002] and incorporated in this document by reference).
4.3	Eighth Supplemental Indenture, dated as of November 24, 2014, among the Company, The Bank of New York Mellon Trust Company, N.A., as trustee, and The Bank of New York Mellon, London Branch, as paying agent (filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed November 24, 2014 [File No. 1-8002] and incorporated in this document by reference).
4.4	Ninth Supplemental Indenture, dated as of July 21, 2015, among the Company, The Bank of New York Mellon Trust Company, N.A., as trustee, and The Bank of New York Mellon, London Branch, as paying agent (filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed July 21, 2015 [File No. 1-8002] and incorporated in this document by reference).
4.5	Eleventh Supplemental Indenture, dated as of December 9, 2015, between the Company and The Bank of New York Mellon Trust Company, N.A. (filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed December 9, 2015 [File No. 1-8002] and incorporated in this document by reference).
4.6	Twelfth Supplemental Indenture, dated as of April 13, 2016, between the Company and The Bank of New York Mellon Trust Company, N.A. (filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed April 13, 2016 [File No. 1-8002] and incorporated in this document by reference).
4.7	Thirteenth Supplemental Indenture, dated as of September 12, 2016, between the Company and The Bank of New York Mellon Trust Company, N.A., as trustee (filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed September 12, 2016 [File No. 1-8002] and incorporated in this document by reference).
4.8	Fourteenth Supplemental Indenture, dated as of September 19, 2016, between the Company and The Bank of New York Mellon Trust Company, N.A., as trustee (filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed September 19, 2016 [File No. 1-8002] and incorporated in this document by reference).
4.9	Fifteenth Supplemental Indenture, dated as of March 16, 2017, between the Company and The Bank of New York Mellon Trust Company, N.A., as trustee (filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed March 16, 2017 [File No. 1-8002] and incorporated in this document by reference).
4.10	Sixteenth Supplemental Indenture, dated as of July 24, 2017, between the Company and The Bank of New York Mellon Trust Company, N.A., as trustee (filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed July 24, 2017 [File No. 1-8002] and incorporated in this document by reference).
4.11	Seventeenth Supplemental Indenture, dated as of August 14, 2017, between the Company and The Bank of New York Mellon Trust Company, N.A., as trustee (filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed August 14, 2017 [File No. 1-8002] and incorporated in this document by reference).
4.12	Eighteenth Supplemental Indenture, dated as of September 30, 2019, between the Company, as issuer, and The Bank of New York Mellon Trust Company, N.A., as trustee (filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed September 30, 2019 [File No. 1-8002] and incorporated in this document by reference).
4.13	Nineteenth Supplemental Indenture, dated as of October 8, 2019, between the Company, as issuer, and the Bank of New York Mellon Trust Company, N.A., as trustee (filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed October 8, 2019 [File No. 1-8002] and incorporated in this document by reference).
4.14	Indenture, dated as of August 9, 2016, among Thermo Fisher Scientific (Finance I) B.V., as issuer, the Company, as guarantor, and The Bank of New York Mellon Trust Company, N.A., as trustee (filed as Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed August 9, 2016 [File No. 1-8002] and incorporated in this document by reference).
4.15	Second Supplemental Indenture, dated as of August 8, 2018, among Thermo Fisher Scientific (Finance I) B.V., as issuer, the Company, as guarantor, and The Bank of New York Mellon Trust Company, N.A., as trustee (filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed August 8, 2018 [File No. 1-8002] and incorporated in this document by reference).

THERMO FISHER SCIENTIFIC INC.

EXHIBIT INDEX

Exhibit Number	Description of Exhibit
4.16	Description of the Registrant's Securities.
10.1	Thermo Fisher Scientific Inc. Deferred Compensation Plan for Directors of the Registrant, as amended and restated on September 12, 2007 (filed as Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 29, 2007 [File No. 1-8002] and incorporated in this document by reference).*
10.2	Thermo Electron Corporation Deferred Compensation Plan, effective November 1, 2001 (filed as Exhibit 10.13 to the Registrant's Annual Report on Form 10-K for the fiscal year ended December 29, 2001 [File No. 1-8002] and incorporated in this document by reference).*
10.3	Form of Amended and Restated Indemnification Agreement between the Registrant and its directors and officers (filed as Exhibit 10.2 to the Registrant's Registration Statement on Form S-4 [Reg. No. 333-90661] and incorporated in this document by reference).*
10.4	Summary of Thermo Fisher Scientific Inc. Annual Director Compensation. *
10.5	Summary of 2019 Annual Cash Incentive Plan Matters (set forth in Item 5.02 to the Registrant's Current Report on Form 8-K filed February 28, 2019 [File No. 1-8002] under the heading "Compensatory Arrangements of Certain Officers" and incorporated in this document by reference).*
10.6	Form of Noncompetition Agreement between the Registrant and certain key employees and executive officers (filed as Exhibit 10.25 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2009 [File No. 1-8002] and incorporated in this document by reference).*
10.7	Retirement Plan for Non-Employee Directors of Fisher Scientific International Inc. (filed as Exhibit 10.12 to Fisher Scientific International Inc.'s Annual Report on Form 10-K for the year ended December 31, 1992 [File No. 1-10920] and incorporated in this document by reference).*
10.8	First Amendment to the Fisher Scientific International Inc. Retirement Plan for Non-Employee Directors (filed as Exhibit 10.04 to Fisher Scientific International Inc.'s Quarterly Report on Form 10-Q for the quarter ended March 31, 2005 [File No. 1-10920] and incorporated in this document by reference).*
10.9	Amendment to Retirement Plan for Non-Employee Directors of Fisher Scientific International Inc. (filed as Exhibit 10.02 to Fisher Scientific International Inc.'s Current Report on Form 8-K filed March 7, 2006 [File No. 1-10920] and incorporated in this document by reference).*
10.10	Thermo Fisher Scientific Inc. Amended and Restated 2005 Deferred Compensation Plan, effective January 1, 2009 (filed as Exhibit 10.43 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2008 [File No. 1-8002] and incorporated in this document by reference).*
10.11	Thermo Fisher Scientific Inc. 2008 Stock Incentive Plan (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed May 22, 2008 [File No. 1-8002] and incorporated in this document by reference).*
10.12	Amendment No. 1 to Thermo Fisher Scientific Inc. Amended and Restated 2005 Deferred Compensation Plan (filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 27, 2009 [File No. 1-8002] and incorporated in this document by reference).*
10.13	2009 Restatement of Executive Severance Agreement, between Marc Casper and the Registrant, dated November 21, 2009 (filed as Exhibit 10.5 to the Registrant's Current Report on Form 8-K filed November 25, 2009 [File No. 1-8002] and incorporated in this document by reference).*
10.14	Executive Change In Control Retention Agreement, between Marc Casper and the Registrant, dated November 21, 2009 (filed as Exhibit 10.6 to the Registrant's Current Report on Form 8-K filed November 25, 2009 [File No. 1-8002] and incorporated in this document by reference).*
10.15	Noncompetition Agreement, between Marc Casper and the Registrant, dated November 21, 2009 (filed as Exhibit 10.7 to the Registrant's Current Report on Form 8-K filed November 25, 2009 [File No. 1-8002] and incorporated in this document by reference).*
10.16	Amendment No. 1 to 2009 Restatement of Executive Severance Agreement, dated February 25, 2010, between the Registrant and Marc N. Casper (filed as Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed February 25, 2010 [File No. 1-8002] and incorporated in this document by reference).*
10.17	Amendment No. 2 to 2009 Restatement of Executive Severance Agreement, dated November 30, 2010, between the Registrant and Marc N. Casper (filed as Exhibit 10.55 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2010 [File No. 1-8002] and incorporated in this document by reference).*
10.18	Amendment No. 1 to Executive Change In Control Retention Agreement, dated November 30, 2010, between Marc N. Casper and the Registrant (filed as Exhibit 10.56 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2010 [File No. 1-8002] and incorporated in this document by reference).*
10.19	Amendment No. 2 to Executive Change in Control Retention Agreement, dated March 16, 2018, between Marc N. Casper and the Registrant (filed as Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2018 [File No. 1-8002] and incorporated in this document by reference).*
10.20	Form of Executive Change in Control Retention Agreement for Officers (other than Marc Casper) (filed as Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2018 [File No. 1-8002] and incorporated in this document by reference).*
10.21	Amendment to 2008 Stock Incentive Plan dated November 10, 2010 (filed as Exhibit 10.57 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2010 [File No. 1-8002] and incorporated in this document by reference).*

THERMO FISHER SCIENTIFIC INC.

EXHIBIT INDEX

Exhibit Number	Description of Exhibit
10.22	Form of Thermo Fisher Scientific Inc.'s Restricted Stock Unit Agreement for Directors (filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended April 2, 2011 [File No. 1-8002] and incorporated in this document by reference).*
10.23	Form of Thermo Fisher Scientific Inc.'s Performance Restricted Stock Unit Agreement (filed as Exhibit 10.4 to the Registrant's Current Report on Form 8-K filed February 27, 2013 [File No. 1-8002] and incorporated in this document by reference).*
10.24	Form of Thermo Fisher Scientific Inc.'s Restricted Stock Unit Agreement (filed as Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed February 27, 2013 [File No. 1-8002] and incorporated in this document by reference).*
10.25	Form of Performance Restricted Stock Unit Agreement between Thermo Fisher Scientific Inc. and Marc Casper (filed as Exhibit 10.3 to the Registrant's Current Report on Form 8-K filed February 27, 2013 [File No. 1-8002] and incorporated in this document by reference).*
10.26	Form of Restricted Stock Unit Agreement between Thermo Fisher Scientific Inc. and Marc Casper (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed February 27, 2013 [File No. 1-8002] and incorporated in this document by reference).*
10.27	Form of Stock Option Agreement between Thermo Fisher Scientific Inc. and Marc Casper (filed as Exhibit 10.5 to the Registrant's Current Report on Form 8-K filed February 27, 2013 [File No. 1-8002] and incorporated in this document by reference).*
10.28	Thermo Fisher Scientific Inc. 2013 Stock Incentive Plan (filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed May 23, 2013 [File No. 1-8002] and incorporated in this document by reference).*
10.29	Supplemental Executive Retirement Plan effective as of December 31, 2005, as amended and restated as of August 28, 2006 (filed as Exhibit 10.3 to Applera Corporation's Quarterly Report on Form 10-Q for the quarter ended September 30, 2006 [File No. 1-04389] and incorporated in this document by reference).*
10.30	Amendment to Supplemental Executive Retirement Plan, effective as of January 1, 2010 (filed as Exhibit 10.1 to Life Technologies Corporation's Current Report on Form 8-K filed December 18, 2009 [File No. 000-25317] and incorporated in this document by reference).*
10.31	Noncompetition Agreement between the Registrant and Mark Stevenson, dated September 10, 2015 (filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 26, 2015 [File No. 1-8002] and incorporated in this document by reference).*
10.32	Form of Thermo Fisher Scientific Inc.'s Stock Option Agreement for Officers (filed as Exhibit 10.44 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2016 [File No. 1-8002] and incorporated in this document by reference).*
10.33	Patheon N.V. 2016 Omnibus Incentive Plan (filed as Exhibit 10.2 to the Current Report on Form 8-K filed by Patheon N.V. on July 26, 2016 [File No. 001-37837] and incorporated in this document by reference).*
10.34	Amendment to Patheon N.V. 2016 Omnibus Incentive Plan, dated March 7, 2017 (filed as exhibit 4.5 to the Registrant's Registration Statement on Form S-8 filed August 29, 2017 [File No. 1-8002] and incorporated in this document by reference).*
10.35	Amendment to Patheon N.V. 2016 Omnibus Incentive Plan, dated August 23, 2017 (filed as exhibit 4.6 to the Registrant's Registration Statement on Form S-8 filed August 29, 2017 [File No. 1-8002] and incorporated in this document by reference).*
10.36	Credit Agreement, dated July 1, 2016, among the Company, certain Subsidiaries of the Company from time to time party thereto, each lender from time to time party thereto, and Bank of America, N.A. (filed as Exhibit 10.3 to the Registrant's Current Report on Form 8-K filed July 1, 2016 [File No. 1-8002] and incorporated in this document by reference).
10.37	Form of Performance Restricted Stock Unit Agreement effective February 26, 2019 (filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 30, 2019 [File No. 1-8002] and incorporated in this document by reference).*
10.38	Form of Performance Restricted Stock Unit Agreement for Marc Casper effective February 26, 2019 (filed as Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 30, 2019 [File No. 1-8002] and incorporated in this document by reference).*
10.39	Letter Agreement between the Registrant and Michel Lagarde dated August 28, 2017. *
10.40	Option Agreement Under the Patheon N.V. 2016 Omnibus Incentive Plan between Patheon N.V. and Michel Lagarde dated July 20, 2016. *
10.41	Restricted Share Unit Award Agreement between Patheon N.V. and Michel Lagarde dated March 23, 2017 as amended. *
10.42	Option Agreement Under the Patheon N.V. 2016 Omnibus Incentive Plan between Patheon N.V. and Michel Lagarde dated March 23, 2017. *
10.43	Thermo Fisher Scientific Inc. Executive Severance Policy (filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 29, 2019 [File No. 1-8002] and incorporated in this document by reference).*
10.44	Form of Noncompetition Agreement between the Registrant and certain key employees and executive officers (filed as Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 29, 2019 [File No. 1-8002] and incorporated in this document by reference).*

THERMO FISHER SCIENTIFIC INC.

EXHIBIT INDEX

Exhibit Number	Description of Exhibit
10.45	Form of Thermo Fisher Scientific Inc.'s Performance Restricted Stock Unit Agreement.*
10.46	Form of Thermo Fisher Scientific Inc.'s Restricted Stock Unit Agreement.*
10.47	Form of Thermo Fisher Scientific Inc.'s Stock Option Agreement for Officers.*
10.48	Form of Performance Restricted Stock Unit Agreement between Thermo Fisher Scientific Inc. and Marc Casper.*
10.49	Form of Restricted Stock Unit Agreement between Thermo Fisher Scientific Inc. and Marc Casper.*
10.50	Form of Stock Option Agreement between Thermo Fisher Scientific Inc. and Marc Casper.*
21	Subsidiaries of the Registrant.
23.1	Consent of PricewaterhouseCoopers LLP, an Independent Registered Public Accounting Firm.
31.1	Certification of Chief Executive Officer required by Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification of Chief Financial Officer required by Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1	Certification of Chief Executive Officer required by Exchange Act Rules 13a-14(b) and 15d-14(b), as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.**
32.2	Certification of Chief Financial Officer required by Exchange Act Rules 13a-14(b) and 15d-14(b), as adopted 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 Calculation Linkbase Document.
101.DEF	XBRL Taxonomy Definition Linkbase Document.
101.LAB	XBRL Taxonomy Label Linkbase Document.
101.PRE	XBRL Taxonomy Presentation Linkbase Document.
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101).

*Indicates management contract or compensatory plan, contract or arrangement.

** Certification is not deemed "filed" for purposes of Section 18 of the Exchange Act or otherwise subject to the liability of that section. Such certification is not deemed to be incorporated by reference into any filing under the Securities Act or the Exchange Act except to the extent that the registrant specifically incorporates it by reference.

THERMO FISHER SCIENTIFIC INC.

INDEX OF CONSOLIDATED FINANCIAL STATEMENTS

The following Consolidated Financial Statements of the Registrant and its subsidiaries are required to be included in Item 15:

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Report of Independent Registered Public Accounting Firm	F-2
Consolidated Balance Sheet as of December 31, 2019 and 2018	F-6
Consolidated Statement of Income for the years ended December 31, 2019, 2018 and 2017	F-7
Consolidated Statement of Comprehensive Income for the years ended December 31, 2019, 2018 and 2017	F-8
Consolidated Statement of Cash Flows for the years ended December 31, 2019, 2018 and 2017	F-9
Consolidated Statement of Shareholders' Equity for the years ended December 31, 2019, 2018 and 2017	F-10
Notes to Consolidated Financial Statements	F-11

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Thermo Fisher Scientific Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheet of Thermo Fisher Scientific Inc. and its subsidiaries (the "Company") as of December 31, 2019 and 2018, and the related consolidated statements of income, of comprehensive income, of shareholders' equity and of cash flows for each of the three years in the period ended December 31, 2019, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2019, 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, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 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, 2019, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 1 to the consolidated financial statements, the Company changed the manner in which it accounts for leases in 2019.

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 Annual 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 matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate 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 matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Goodwill impairment assessment

As described in Note 1 to the consolidated financial statements, the Company's consolidated goodwill balance was \$25,714 million as of December 31, 2019. Management evaluates goodwill impairment at the reporting unit level annually and when events occur or circumstances change that would more-likely-than-not reduce the fair value of the reporting unit below its carrying amount. In performing the assessment, management estimates the fair values of its reporting units by using forecasts of discounted future cash flows and peer market multiples. As disclosed by management, estimates of discounted future cash flows require management to make assumptions related to revenue and operating income growth rates, discount rates and other factors. Management also considers peer revenues and earnings trading multiples from companies that have operational and financial characteristics that are similar to the respective reporting units and estimates weighted average costs of capital.

The principal considerations for our determination that performing procedures relating to the goodwill impairment assessment is a critical audit matter are there was significant judgment by management when estimating the fair value of the reporting units. This in turn led to a high degree of auditor judgment, subjectivity and effort in performing procedures to evaluate management's cash flow projections and significant assumptions, including revenue and operating income growth rates, discount rates and peer market multiples. In addition, the audit

effort involved the use of professionals with specialized skill and knowledge to assist in performing these procedures and evaluating the audit evidence obtained from these procedures.

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 goodwill impairment assessment, including controls over the development of assumptions used by management to estimate the fair values of the Company's reporting units. These procedures also included, among others, testing management's process for developing the fair value estimates; evaluating the appropriateness of the discounted cash flow models; testing the completeness, accuracy, and relevance of underlying data used in the models; and evaluating the reasonableness of the assumptions used, including revenue and operating income growth rates, discount rates and peer market multiples. Evaluating the reasonableness of management's assumptions related to revenue and operating income growth rates involved evaluating whether the assumptions used were reasonable considering (i) the current and past performance of the reporting units and (ii) whether the assumptions were consistent with evidence obtained in other areas of the audit. Evaluating the reasonableness of the peer market multiples assumption involved evaluating the population of peer companies used in the analyses and testing selected market data used by management to determine the multiples by comparison to publicly available information. Professionals with specialized skill and knowledge were used to assist in evaluating the appropriateness of the Company's discounted cash flow model and certain significant assumptions, including the discount rates.

Income taxes

As described in Notes 1 and 8 to the consolidated financial statements, the Company's total income tax expense for the period ended December 31, 2019 was \$374 million. The Company has deferred income tax liabilities, net, of \$1,619 million (including a valuation allowance of \$408 million) and unrecognized income tax benefits of \$1,552 million as of December 31, 2019. As disclosed by management, the Company operates in numerous countries under many legal forms and, as a result, is subject to the jurisdiction of numerous domestic and non-U.S. tax authorities, as well as to tax agreements and treaties among these governments. Determination of taxable income in any jurisdiction requires management to interpret the related tax laws and regulations and to use estimates and assumptions regarding significant future events, such as the amount, timing and character of deductions, permissible revenue recognition methods under the tax law and the sources and character of income and tax credits. Management assesses income tax positions and records tax benefits for all years subject to examination based upon evaluation of the facts, circumstances and information available at the reporting date. For those tax positions where it is more likely than not that a tax benefit will be sustained, management has recorded the largest amount of tax benefit with a greater than 50 percent likelihood of being realized upon ultimate settlement with a taxing authority that has full knowledge of all relevant information. For those income tax positions where it is not more likely than not that a tax benefit will be sustained, no tax benefit has been recognized in the financial statements. Management estimates the degree to which tax assets will result in a benefit, after consideration of all positive and negative evidence, and provides a valuation allowance for tax assets that it believes will more likely than not go unused. In situations in which management has been able to determine that the Company's deferred tax assets will be realized, that determination generally relies on future reversals of taxable temporary differences and expected future taxable income. If it becomes more likely than not that a tax asset will be used, management reverses the related valuation allowance. The principal considerations for our determination that performing procedures relating to income taxes is a critical audit matter are there was significant judgment by management when determining the provision for income taxes, deferred tax assets and liabilities, and liabilities for unrecognized tax benefits due to numerous and complex tax laws, the frequency of tax filings, as well as judgments regarding the realizability of deferred tax assets. This in turn led to a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating audit evidence related to the provision for income taxes, deferred tax assets and liabilities, and

liabilities for unrecognized tax benefits. In addition, the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing these procedures and evaluating the audit evidence obtained from these procedures.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the financial statements. These procedures included testing the effectiveness of controls relating to the provision for income taxes, deferred tax assets and liabilities, and liabilities for unrecognized tax benefits, including controls over management's assessment of the realizability of deferred tax assets. These procedures also included, among others, (i) testing the accuracy of the income tax provision, including the rate reconciliation and permanent and temporary differences, (ii) evaluating whether the data utilized in the calculation of the provision for income taxes was appropriate and consistent with evidence obtained in other areas of the audit, (iii) evaluating management's assessment of the realizability of deferred tax assets on a jurisdictional basis, (iv) evaluating the identification of reserves for unrecognized tax benefits and the reasonableness of the "more likely than not" determination in consideration of jurisdictions, court decisions, legislative actions, statutes of limitations, and developments in tax examinations, (v) testing the calculation of the liability for unrecognized tax benefits by jurisdiction, including estimates of the amount of tax benefit expected to be sustained, and (vi) evaluating the adequacy of the Company's disclosures. Professionals with specialized skill and knowledge were used to assist in evaluating the reasonableness of management's judgments and estimates, including application of foreign and domestic tax laws and regulations.

/s/ PricewaterhouseCoopers LLP
Boston, Massachusetts
February 26, 2020

We have served as the Company's auditor since 2002.

THERMO FISHER SCIENTIFIC INC.

CONSOLIDATED BALANCE SHEET

(In millions except share and per share amounts)	December 31, 2019	December 31, 2018
Assets		
Current Assets:		
Cash and cash equivalents	\$ 2,399	\$ 2,103
Accounts receivable, less allowances of \$102 and \$117	4,349	4,136
Inventories	3,370	3,005
Contract assets, net	603	459
Other current assets	1,172	922
Total current assets	11,893	10,625
Property, Plant and Equipment, Net	4,749	4,165
Acquisition-related Intangible Assets, Net	14,014	14,978
Other Assets	2,011	1,117
Goodwill	25,714	25,347
Total Assets	\$ 58,381	\$ 56,232
Liabilities and Shareholders' Equity		
Current Liabilities:		
Short-term obligations and current maturities of long-term obligations	\$ 676	\$ 1,271
Accounts payable	1,920	1,615
Accrued payroll and employee benefits	1,010	982
Contract liabilities	916	809
Other accrued expenses	1,675	1,470
Total current liabilities	6,197	6,147
Deferred Income Taxes	2,192	2,265
Other Long-term Liabilities	3,241	2,515
Long-term Obligations	17,076	17,719
Commitments and Contingencies (Note 12)		
Shareholders' Equity:		
Preferred stock, \$100 par value, 50,000 shares authorized; none issued		
Common stock, \$1 par value, 1,200,000,000 shares authorized; 434,416,804 and 431,566,561 shares issued	434	432
Capital in excess of par value	15,064	14,621
Retained earnings	22,092	18,696
Treasury stock at cost, 35,676,421 and 29,444,882 shares	(5,236)	(3,665)
Accumulated other comprehensive items	(2,679)	(2,498)
Total shareholders' equity	29,675	27,586
Total Liabilities and Shareholders' Equity	\$ 58,381	\$ 56,232

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

THERMO FISHER SCIENTIFIC INC.

CONSOLIDATED STATEMENT OF INCOME

(In millions except per share amounts)	Year Ended		
	December 31, 2019	December 31, 2018	December 31, 2017
Revenues			
Product revenues	\$ 19,496	\$ 18,868	\$ 17,374
Service revenues	6,046	5,490	3,544
Total revenues	25,542	24,358	20,918
Costs and Operating Expenses:			
Cost of product revenues	10,037	9,682	8,975
Cost of service revenues	4,177	3,819	2,495
Selling, general and administrative expenses	6,144	6,057	5,504
Research and development expenses	1,003	967	887
Restructuring and other (income) costs, net	(413)	50	97
Total costs and operating expenses	20,948	20,575	17,958
Operating Income	4,594	3,783	2,960
Interest Income	224	137	81
Interest Expense	(676)	(667)	(592)
Other (Expense) Income, Net	(72)	9	(20)
Income from Continuing Operations Before Income Taxes	4,070	3,262	2,429
Provision for Income Taxes	(374)	(324)	(201)
Income from Continuing Operations	3,696	2,938	2,228
Loss from Discontinued Operations (net of income tax benefit of \$0, \$0 and \$2)	—	—	(3)
Net Income	\$ 3,696	\$ 2,938	\$ 2,225
Earnings per Share from Continuing Operations			
Basic	\$ 9.24	\$ 7.31	\$ 5.65
Diluted	\$ 9.17	\$ 7.24	\$ 5.60
Earnings per Share			
Basic	\$ 9.24	\$ 7.31	\$ 5.64
Diluted	\$ 9.17	\$ 7.24	\$ 5.59
Weighted Average Shares			
Basic	400	402	395
Diluted	403	406	398

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

THERMO FISHER SCIENTIFIC INC.

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME

(In millions)	Year Ended		
	December 31, 2019	December 31, 2018	December 31, 2017
Comprehensive Income			
Net Income	\$ 3,696	\$ 2,938	\$ 2,225
Other Comprehensive Items:			
Currency translation adjustment:			
Currency translation adjustment (net of tax provision (benefit) of \$25, \$84 and \$(145))	(107)	(434)	588
Reclassification adjustment for losses included in net income	30	—	—
Unrealized gains and losses on available-for-sale investments:			
Unrealized holding losses arising during the period (net of tax benefit of \$0, \$0 and \$0)	—	—	(1)
Reclassification adjustment for gains included in net income (net of tax provision of \$0, \$0 and \$1)	—	—	(1)
Unrealized gains and losses on hedging instruments:			
Unrealized losses on hedging instruments (net of tax benefit of \$12, \$0 and \$0)	(38)	—	—
Reclassification adjustment for losses included in net income (net of tax benefit of \$6, \$3 and \$5)	19	9	7
Pension and other postretirement benefit liability adjustments:			
Pension and other postretirement benefit liability adjustments arising during the period (net of tax (benefit) provision of \$(31), \$2 and \$7)	(93)	3	23
Amortization of net loss and prior service benefit included in net periodic pension cost (net of tax benefit of \$2, \$5 and \$5)	8	15	17
Total other comprehensive items	(181)	(407)	633
Comprehensive Income	\$ 3,515	\$ 2,531	\$ 2,858

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

THERMO FISHER SCIENTIFIC INC.

CONSOLIDATED STATEMENT OF CASH FLOWS

(In millions)	Year Ended		
	December 31, 2019	December 31, 2018	December 31, 2017
Operating Activities			
Net income	\$ 3,696	\$ 2,938	\$ 2,225
Loss from discontinued operations	—	—	3
Income from continuing operations	3,696	2,938	2,228
Adjustments to reconcile income from continuing operations to net cash provided by operating activities:			
Depreciation of property, plant and equipment	564	526	439
Amortization of acquisition-related intangible assets	1,713	1,741	1,594
Change in deferred income taxes	(302)	(379)	(1,098)
Gain on sales of businesses	(482)	—	—
Non-cash stock-based compensation	181	181	159
Loss on early extinguishment of debt	184	3	4
Other non-cash expenses, net	84	103	186
Changes in assets and liabilities, excluding the effects of acquisitions and disposition:			
Accounts receivable	(225)	(366)	(362)
Inventories	(458)	(324)	(81)
Other assets	(408)	54	(153)
Accounts payable	266	201	274
Other liabilities	210	(42)	1,016
Contributions to retirement plans	(50)	(93)	(200)
Net cash provided by continuing operations	4,973	4,543	4,006
Net cash used in discontinued operations	—	—	(1)
Net cash provided by operating activities	4,973	4,543	4,005
Investing Activities			
Acquisitions, net of cash acquired	(1,843)	(536)	(7,226)
Proceeds from sale of business, net of cash divested	1,128	—	—
Purchase of property, plant and equipment	(926)	(758)	(508)
Proceeds from sale of property, plant and equipment	36	50	7
Other investing activities, net	118	(9)	(2)
Net cash used in investing activities	(1,487)	(1,253)	(7,729)
Financing Activities			
Net proceeds from issuance of debt	5,638	690	6,459
Repayment of debt	(6,360)	(2,052)	(3,299)
Proceeds from issuance of commercial paper	2,781	5,060	8,380
Repayments of commercial paper	(3,464)	(5,254)	(8,514)
Purchases of company common stock	(1,500)	(500)	(750)
Dividends paid	(297)	(266)	(237)
Net proceeds from issuance of company common stock	—	—	1,690
Net proceeds from issuance of company common stock under employee stock plans	153	136	128
Other financing activities, net	(69)	(51)	(3)
Net cash (used in) provided by financing activities	(3,118)	(2,237)	3,854
Exchange Rate Effect on Cash	(63)	(297)	420
Increase in Cash, Cash Equivalents and Restricted Cash	305	756	550
Cash, Cash Equivalents and Restricted Cash at Beginning of Period	2,117	1,361	811
Cash, Cash Equivalents and Restricted Cash at End of Period	\$ 2,422	\$ 2,117	\$ 1,361

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

THERMO FISHER SCIENTIFIC INC.

CONSOLIDATED STATEMENT OF SHAREHOLDERS' EQUITY

(In millions)	Common Stock		Capital in Excess of Par Value	Retained Earnings	Treasury Stock		Accumulated Other Comprehensive Items	Total Shareholders' Equity
	Shares	Amount			Shares	Amount		
Balance at December 31, 2016	415	\$ 415	\$ 12,140	\$ 13,927	22	\$ (2,306)	\$ (2,636)	\$ 21,540
Issuance of shares under employees' and directors' stock plans	3	3	196	—	—	(47)	—	152
Issuance of shares	10	10	1,680	—	—	—	—	1,690
Stock-based compensation	—	—	159	—	—	—	—	159
Purchases of company common stock	—	—	—	—	5	(750)	—	(750)
Dividends declared (\$0.60 per share)	—	—	—	(238)	—	—	—	(238)
Net income	—	—	—	2,225	—	—	—	2,225
Other comprehensive items	—	—	—	—	—	—	633	633
Other	—	—	2	—	—	—	—	2
Balance at December 31, 2017	428	428	14,177	15,914	27	(3,103)	(2,003)	25,413
Cumulative effect of accounting changes	—	—	—	118	—	—	(88)	30
Issuance of shares under employees' and directors' stock plans	4	4	236	—	—	(62)	—	178
Stock-based compensation	—	—	181	—	—	—	—	181
Purchases of company common stock	—	—	—	—	2	(500)	—	(500)
Dividends declared (\$0.68 per share)	—	—	—	(274)	—	—	—	(274)
Net income	—	—	—	2,938	—	—	—	2,938
Other comprehensive items	—	—	—	—	—	—	(407)	(407)
Other	—	—	27	—	—	—	—	27
Balance at December 31, 2018	432	432	14,621	18,696	29	(3,665)	(2,498)	27,586
Cumulative effect of accounting change	—	—	—	4	—	—	—	4
Issuance of shares under employees' and directors' stock plans	2	2	262	—	1	(71)	—	193
Stock-based compensation	—	—	181	—	—	—	—	181
Purchases of company common stock	—	—	—	—	6	(1,500)	—	(1,500)
Dividends declared (\$0.76 per share)	—	—	—	(304)	—	—	—	(304)
Net income	—	—	—	3,696	—	—	—	3,696
Other comprehensive items	—	—	—	—	—	—	(181)	(181)
Balance at December 31, 2019	434	\$ 434	\$ 15,064	\$ 22,092	36	\$ (5,236)	\$ (2,679)	\$ 29,675

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

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1. Nature of Operations and Summary of Significant Accounting Policies

Nature of Operations

Thermo Fisher Scientific Inc. (the company or Thermo Fisher) enables customers to make the world healthier, cleaner and safer by helping them accelerate life sciences research, solve complex analytical challenges, improve patient diagnostics, deliver medicines to market and increase laboratory productivity. Markets served include pharmaceutical and biotech, academic and government, industrial and applied, as well as healthcare and diagnostics.

Principles of Consolidation

The accompanying financial statements include the accounts of the company and its wholly and majority-owned subsidiaries. All material intercompany accounts and transactions have been eliminated. The company accounts for investments in businesses using the equity method when it has the ability to exercise significant influence but not control (generally between 20% and 50% ownership) and is not the primary beneficiary.

Presentation

Certain reclassifications of prior year amounts have been made to conform to the current year presentation.

Revenue Recognition

Prior to 2018, the company recognized revenue after all significant obligations had been met, collectability was probable and title had passed, which typically occurred upon shipment, delivery, completion of services, or ratably over the contract period. Beginning in 2018, the company recognizes revenue as performance obligations are satisfied by transferring control of promised goods or services to customers in an amount that reflects the consideration to which the company expects to be entitled in exchange for those goods or services. See *Recent Accounting Pronouncements* below for a discussion of the change in revenue recognition accounting that became effective in 2018.

Consumables revenues consist of single-use products and are recognized at a point in time following the transfer of control of such products to the customer, which generally occurs upon shipment. Instruments revenues typically consist of longer-lived assets that, for the substantial majority of sales, are recognized at a point in time in a manner similar to consumables. Service revenues (clinical trial logistics, pharmaceutical development and manufacturing services, asset management, diagnostic testing, training, service contracts, and field services including related time and materials) are recognized over time as customers receive and consume the benefits of such services. For revenues recognized over time, the company generally uses costs accumulated relative to total estimated costs to measure progress as this method approximates satisfaction of the performance obligation. For contracts that contain multiple performance obligations, the company allocates the consideration to which it expects to be entitled to each performance obligation based on relative standalone selling prices and recognizes the related revenue when or as control of each individual performance obligation is transferred to customers. The company exercises judgment in determining the timing of revenue by analyzing the point in time or the period over which the customer has the ability to direct the use of and obtain substantially all of the remaining benefits of the asset. The company immediately expenses contract costs that would otherwise be capitalized and amortized over a period of less than one year.

Payments from customers for most instruments, consumables and services are typically due in a fixed number of days after shipment or delivery of the product. Service arrangements commonly call for payments in advance of performing the work (e.g. extended service contracts), upon completion of the service (e.g. pharmaceutical development and manufacturing) or a mix of both.

See Note 3 for revenue disaggregated by type and by geographic region as well as further information about remaining performance obligations.

Contract-related Balances

Accounts receivable include amounts that have been billed and are currently due from customers. They are recorded at the invoiced amount and do not bear interest. The company maintains allowances for doubtful accounts for estimated losses resulting from the inability of its customers to pay amounts due. The allowance for doubtful accounts is the company's best estimate of the amount of probable credit losses in existing accounts receivable. The company determines the allowance based on the age of the receivable, the creditworthiness of the customer and any other information that is relevant to the judgment. Account balances are charged off against the allowance when the company believes it is probable the receivable will not be recovered. The company does not have any off-balance-sheet credit exposure related to customers.

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The changes in the allowance for doubtful accounts are as follows:

(In millions)	Year Ended December 31,		
	2019	2018	2017
Beginning Balance	\$ 117	\$ 109	\$ 77
Provision charged to expense	20	18	32
Accounts written off	(32)	(12)	(10)
Acquisitions, currency translation and other	(3)	2	10
Ending Balance	<u>\$ 102</u>	<u>\$ 117</u>	<u>\$ 109</u>

Contract assets include revenues recognized in advance of billings and are recorded net of estimated losses resulting from the inability to invoice customers. Contract assets are classified as current or noncurrent based on the amount of time expected to lapse until the company's right to consideration becomes unconditional. Noncurrent contract assets are included within other assets in the accompanying balance sheet.

Contract liabilities include billings in excess of revenues recognized, such as those resulting from customer advances and deposits and unearned revenue on service contracts. Contract liabilities are classified as current or noncurrent based on the periods over which remaining performance obligations are expected to be transferred to customers. Noncurrent contract liabilities are included within other long-term liabilities in the accompanying balance sheet. Contract assets and liabilities are presented on a net basis in the consolidated balance sheet if they arise from different performance obligations in the same contract. Contract asset and liability balances are as follows:

(In millions)	December 31, 2019	December 31, 2018
Current Contract Assets, Net	\$ 603	\$ 459
Noncurrent Contract Assets, Net	17	15
Current Contract Liabilities	916	809
Noncurrent Contract Liabilities	594	355

Substantially all of the current contract liabilities balance at December 31, 2018 and January 1 2018, was recognized in revenue during 2019 and 2018, respectively. Contract assets increased in 2019 primarily due to growth in pharmaceutical development and manufacturing services. Contract liabilities increased during 2019 primarily due to an advance payment from a customer and an acquisition.

Warranty Obligations

The company provides for the estimated cost of standard product warranties, primarily from historical information, in cost of product revenues at the time product revenue is recognized. While the company engages in extensive product quality programs and processes, including actively monitoring and evaluating the quality of its component supplies, the company's warranty obligation is affected by product failure rates, utilization levels, material usage, service delivery costs incurred in correcting a product failure and supplier warranties on parts delivered to the company. Should actual product failure rates, utilization levels, material usage, service delivery costs or supplier warranties on parts differ from the company's estimates, revisions to the estimated warranty liability would be required. The liability for warranties is included in other accrued expenses in the accompanying balance sheet. Extended warranty agreements are considered service contracts, which are discussed above. Costs of service contracts are recognized as incurred. The changes in the carrying amount of standard product warranty obligations are as follows:

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

(In millions)	Year Ended	
	December 31, 2019	December 31, 2018
Beginning Balance	\$ 92	\$ 87
Provision charged to income	115	121
Usage	(112)	(109)
Adjustments to previously provided warranties, net	(2)	(4)
Currency translation	—	(3)
Ending Balance	\$ 93	\$ 92

Leases

The company determines whether an arrangement is, or contains, a lease at inception. Prior to 2019, the company did not account for operating leases on the balance sheet. Beginning in 2019, as discussed below under Recent Accounting Pronouncements, operating leases that have commenced are included in other assets, other accrued expenses and other long-term liabilities in the consolidated balance sheet. Classification of operating lease liabilities as either current or noncurrent is based on the expected timing of payments due under the company's obligations.

Right-of-use (ROU) assets represent the company's right to use an underlying asset for the lease term and lease liabilities represent the company's obligation to make lease payments arising from the lease. Operating lease ROU assets and liabilities are recognized at the lease commencement date based on the present value of lease payments over the lease term. Leases with an initial term of 12 months or less are not recorded on the consolidated balance sheet. The company recognizes lease expense for these leases on a straight-line basis over the lease term.

Because most of the company's leases do not provide an implicit rate, the company estimates incremental borrowing rates based on the information available at the commencement date in determining the present value of lease payments. The company uses the implicit rate when readily determinable. Lease terms may include the effect of options to extend or terminate the lease when it is reasonably certain that the company will exercise that option. Operating lease expense is recognized on a straight-line basis over the lease term.

As a lessee, the company accounts for the lease and non-lease components as a single lease component.

See Note 11 additional information about the company's leases.

Research and Development

The company conducts research and development activities to increase its depth of capabilities in technologies, software and services. Research and development costs include employee compensation and benefits, consultants, facilities related costs, material costs, depreciation and travel. Research and development costs are expensed as incurred.

Restructuring Costs

Accounting for the timing and amount of termination benefits provided by the company to employees is determined based on whether: (a) the company has a substantive plan to provide such benefits, (b) the company has a written employment contract with the affected employees that includes a provision for such benefits, (c) the termination benefits are due to the occurrence of an event specified in an existing plan or agreement, or (d) the termination benefits are a one-time benefit. In certain circumstances, employee termination benefits may meet more than one of the characteristics listed above and therefore, may have individual elements that are subject to different accounting models.

From time to time when executing a restructuring or exit plan, the company also incurs costs other than termination benefits, such as lease termination costs, that are not associated with or will not be incurred to generate revenues. These include costs that represent amounts under contractual obligations that exist prior to the restructuring plan communication date and will either continue after the restructuring plan is completed with no economic benefit or result in a penalty to cancel a contractual obligation. Such costs are recognized when incurred, which generally occurs at the contract termination or over the period from when a plan to abandon a leased facility is approved through the cease-use date but charges may continue over the remainder of the original contractual period.

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Income Taxes

The company recognizes deferred income taxes based on the expected future tax consequences of differences between the financial statement basis and the tax basis of assets and liabilities, calculated using enacted tax rates in effect for the year in which the differences are expected to be reflected in the tax return.

The financial statements reflect expected future tax consequences of uncertain tax positions that the company has taken or expects to take on a tax return presuming the taxing authorities' full knowledge of the positions and all relevant facts, but without discounting for the time value of money (Note 8).

Earnings per Share

Basic earnings per share has been computed by dividing net income by the weighted average number of shares outstanding during the year. Except where the result would be antidilutive to income from continuing operations, diluted earnings per share has been computed using the treasury stock method for outstanding stock options and restricted units (Note 9).

Cash and Cash Equivalents

Cash equivalents consists principally of money market funds, commercial paper and other marketable securities purchased with an original maturity of three months or less. These investments are carried at cost, which approximates market value.

Inventories

Inventories are valued at the lower of cost or net realizable value, cost being determined principally by the first-in, first-out (FIFO) method with certain of the company's businesses utilizing the last-in, first-out (LIFO) method. The company periodically reviews quantities of inventories on hand and compares these amounts to the expected use of each product or product line. In addition, the company has certain inventory that is subject to fluctuating market pricing. The company assesses the carrying value of this inventory based on a lower of cost or net realizable value analysis. The company records a charge to cost of sales for the amount required to reduce the carrying value of inventory to net realizable value. Costs associated with the procurement of inventories, such as inbound freight charges, purchasing and receiving costs, and internal transfer costs, are included in cost of revenues in the accompanying statement of income. The components of inventories are as follows:

(In millions)	December 31, 2019	December 31, 2018
Raw Materials	\$ 971	\$ 812
Work in Process	517	430
Finished Goods	1,882	1,763
Inventories	\$ 3,370	\$ 3,005

The value of inventories maintained using the LIFO method was \$268 million and \$244 million at December 31, 2019 and 2018, respectively, which was below estimated replacement cost by \$39 million and \$34 million, respectively. Reductions to cost of revenues as a result of the liquidation of LIFO inventories were nominal during the three years ended December 31, 2019.

Property, Plant and Equipment

Property, plant and equipment are recorded at cost. The costs of additions and improvements are capitalized, while maintenance and repairs are charged to expense as incurred. The company provides for depreciation and amortization using the straight-line method over the estimated useful lives of the property as follows: buildings and improvements, 25 to 40 years; machinery and equipment (including software), 3 to 10 years; and leasehold improvements, the shorter of the term of the lease or the life of the asset. When assets are retired or otherwise disposed of, the assets and related accumulated depreciation are eliminated from the accounts and the resulting gain or loss is reflected in the accompanying statement of income. Property, plant and equipment consists of the following:

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

(In millions)	December 31, 2019	December 31, 2018
Land	\$ 396	\$ 397
Buildings and Improvements	1,873	1,729
Machinery, Equipment and Leasehold Improvements	5,495	4,694
Property, Plant and Equipment, at Cost	7,764	6,820
Less: Accumulated Depreciation and Amortization	3,015	2,655
Property, Plant and Equipment, Net	<u>\$ 4,749</u>	<u>\$ 4,165</u>

Depreciation and amortization expense of property, plant and equipment was \$564 million, \$526 million and \$439 million in 2019, 2018 and 2017, respectively.

Acquisition-related Intangible Assets

Acquisition-related intangible assets include the costs of acquired customer relationships, product technology, tradenames and other specifically identifiable intangible assets, and are being amortized using the straight-line method over their estimated useful lives, which range from 2 to 20 years. In addition, the company has tradenames and in-process research and development that have indefinite lives and which are not amortized. The company reviews intangible assets for impairment when indication of potential impairment exists, such as a significant reduction in cash flows associated with the assets. Intangible assets with indefinite lives are reviewed for impairment annually or whenever events or changes in circumstances indicate they may be impaired. Acquisition-related intangible assets are as follows:

(In millions)	Balance at December 31, 2019			Balance at December 31, 2018		
	Gross	Accumulated Amortization	Net	Gross	Accumulated Amortization	Net
<i>Definite Lived:</i>						
Customer relationships	\$ 16,906	\$ (6,997)	\$ 9,909	\$ 17,120	\$ (6,833)	\$ 10,287
Product technology	5,544	(3,121)	2,423	6,036	(3,178)	2,858
Tradenames	1,300	(869)	431	1,495	(929)	566
Other	9	(9)	—	33	(33)	—
	<u>23,759</u>	<u>(10,996)</u>	<u>12,763</u>	<u>24,684</u>	<u>(10,973)</u>	<u>13,711</u>
<i>Indefinite Lived:</i>						
Tradenames	1,235	N/A	1,235	1,235	N/A	1,235
In-process research and development	16	N/A	16	32	N/A	32
	<u>1,251</u>	<u>N/A</u>	<u>1,251</u>	<u>1,267</u>	<u>N/A</u>	<u>1,267</u>
Acquisition-related Intangible Assets	<u>\$ 25,010</u>	<u>\$ (10,996)</u>	<u>\$ 14,014</u>	<u>\$ 25,951</u>	<u>\$ (10,973)</u>	<u>\$ 14,978</u>

The estimated future amortization expense of acquisition-related intangible assets with definite lives is as follows:

(In millions)	
2020	\$ 1,660
2021	1,552
2022	1,406
2023	1,329
2024	1,168
2025 and Thereafter	5,648
Estimated Future Amortization Expense of Definite-lived Intangible Assets	<u>\$ 12,763</u>

THERMO FISHER SCIENTIFIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Amortization of acquisition-related intangible assets was \$1.71 billion, \$1.74 billion and \$1.59 billion in 2019, 2018 and 2017, respectively.

Other Assets

Other assets in the accompanying balance sheet include operating lease right-of-use assets, deferred tax assets, pension assets, cash surrender value of life insurance, insurance recovery receivables related to product liability matters, investments and other assets.

Prior to January 1, 2018, investments for which there are not readily determinable market values were accounted for under the cost method of accounting. The company periodically evaluated the carrying value of its investments accounted for under the cost method of accounting, which provided that they are recorded at the lower of cost or estimated net realizable value. Effective January 1, 2018, equity investments that do not have readily determinable fair values are measured at cost minus impairment, if any, plus or minus changes resulting from observable price changes in orderly transactions for the identical or similar investments of the same issuer. The company performs qualitative assessments to identify impairments of these investments. At December 31, 2019 and 2018, the company had such investments with carrying amounts of \$34 million and \$36 million, respectively, which are included in other assets.

Goodwill

The company assesses goodwill for impairment at the reporting unit level annually and whenever events occur or circumstances change that would more-likely-than-not reduce the fair value of a reporting unit below its carrying amount. Such events or circumstances generally include the occurrence of operating losses or a significant decline in earnings associated with one or more of the company's reporting units. The company is permitted to first assess qualitative factors to determine whether the goodwill impairment test is necessary. If the qualitative assessment results in a determination that the fair value of a reporting unit is more-likely-than-not less than its carrying amount, the company performs a quantitative goodwill impairment test. The company may bypass the qualitative assessment for the reporting unit in any period and proceed directly to the goodwill impairment test. The company estimates the fair value of its reporting units by using forecasts of discounted future cash flows and peer market multiples. The company would record an impairment charge based on the excess of a reporting unit's carrying amount over its fair value (limited to the amount of goodwill). The company determined that no impairments existed in 2019, 2018 or 2017.

The changes in the carrying amount of goodwill by segment are as follows:

(In millions)	Life Sciences Solutions	Analytical Instruments	Specialty Diagnostics	Laboratory Products and Services	Total
Balance at December 31, 2017	\$ 8,391	\$ 5,027	\$ 3,856	\$ 8,016	\$ 25,290
Acquisitions	161	—	—	—	161
Finalization of purchase price allocations for 2017 acquisitions	—	1	—	20	21
Currency translation	(5)	(77)	(121)	79	(124)
Other	1	(1)	—	(1)	(1)
Balance at December 31, 2018	8,548	4,950	3,735	8,114	25,347
Acquisitions	—	9	—	938	947
Finalization of purchase price allocations for 2018 acquisitions	(2)	—	—	—	(2)
Sale of business	—	—	(478)	—	(478)
Currency translation	(3)	(38)	(72)	11	(102)
Other	1	7	(1)	(5)	2
Balance at December 31, 2019	<u>\$ 8,544</u>	<u>\$ 4,928</u>	<u>\$ 3,184</u>	<u>\$ 9,058</u>	<u>\$ 25,714</u>

Loss Contingencies

Accruals are recorded for various contingencies, including legal proceedings, environmental, workers' compensation, product, general and auto liabilities, self-insurance and other claims that arise in the normal course of business. The accruals are based on management's judgment, historical claims experience, the probability of losses and, where applicable, the consideration of opinions of internal and/or external legal counsel and actuarial estimates. Additionally, the company records

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

receivables from third-party insurers up to the amount of the loss when recovery has been determined to be probable. Liabilities acquired in acquisitions have been recorded at fair value and, as such, were discounted to present value at the dates of acquisition.

Currency Translation

All assets and liabilities of the company's non-U.S. subsidiaries are translated at period-end exchange rates. Resulting translation adjustments are reflected in the "accumulated other comprehensive items" component of shareholders' equity. Revenues and expenses are translated at average exchange rates for the period. Currency transaction gains (losses) are included in the accompanying statement of income and in aggregate were \$52 million, \$19 million and \$(31) million in 2019, 2018 and 2017, respectively.

Derivative Contracts

The company is exposed to certain risks relating to its ongoing business operations including changes to interest rates and currency exchange rates. The company uses derivative instruments primarily to manage currency exchange and interest rate risks. The company recognizes derivative instruments as either assets or liabilities and measures those instruments at fair value. If a derivative is a hedge, depending on the nature of the hedge, changes in the fair value of the derivative are either offset against the change in fair value of the hedged item through earnings or recognized in other comprehensive items until the hedged item is recognized in earnings. Derivatives that are not designated as hedges are recorded at fair value through earnings.

The company uses short-term forward and option currency exchange contracts primarily to hedge certain balance sheet and operational exposures resulting from changes in currency exchange rates, predominantly intercompany loans and cash balances that are denominated in currencies other than the functional currencies of the respective operations. The currency-exchange contracts principally hedge transactions denominated in Swiss franc, euro, Canadian dollars, Swedish kronor, British pounds sterling, Japanese yen and Czech koruna. The company does not hold or engage in transactions involving derivative instruments for purposes other than risk management.

Cash flow hedges. For derivative instruments that are designated and qualify as a cash flow hedge, the gain or loss on the derivative is reported as a component of other comprehensive items and reclassified into earnings in the same period or periods during which the hedged transaction affects earnings and is presented in the same income statement line item as the earnings effect of the hedged item.

Fair value hedges. For derivative instruments that are designated and qualify as a fair value hedge, the gain or loss on the derivative, as well as the offsetting loss or gain on the hedged item attributable to the hedged risk, are recognized in earnings.

Net investment hedges. The company also uses foreign currency-denominated debt and cross-currency interest rate swaps to partially hedge its net investments in foreign operations against adverse movements in exchange rates. The majority of the company's euro-denominated senior notes and cross-currency interest rate swaps have been designated as, and are effective as, economic hedges of part of the net investment in a foreign operation. Accordingly, foreign currency transaction gains or losses due to spot rate fluctuations on the euro-denominated debt instruments and contract fair value changes on the cross-currency interest rate swaps, excluding interest accruals, are included in currency translation adjustment within other comprehensive items and shareholders' equity.

Use of Estimates

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Recent Accounting Pronouncements

In January 2020, the FASB issued new guidance to clarify the interaction of the accounting for certain equity securities, equity method investments, and certain forward contracts and purchased options. Among other things, the new guidance clarifies that an entity should consider observable transactions that require it to either apply or discontinue the equity method of accounting for the purposes of applying measurement principles for certain equity securities immediately before applying or discontinuing the equity method. The company expects to adopt this guidance in 2020 using a prospective method. The adoption of this guidance is not expected to have a material impact on the company's consolidated financial statements.

In December 2019, the FASB issued new guidance to simplify the accounting for income taxes. Among other things, the new guidance requires the effects of enacted changes in tax laws or rates to be reflected in the annual effective tax rate

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computation in the interim period that includes the enactment date. The company expects to adopt this guidance when it is effective in 2021 using a prospective method. The adoption of this guidance is not expected to have a material impact on the company's consolidated financial statements; however, the impact in future periods will be dependent on the extent of future events or conditions that would be affected such as enacted changes in tax laws or rates.

In August 2018, the FASB issued new guidance to modify the disclosure requirements for employers that sponsor defined benefit pension or other postretirement plans. The company will adopt the guidance in 2020 using a retrospective method. The adoption of this guidance is not expected to have a material impact on the company's disclosures.

In August 2018, the FASB issued new guidance to modify the disclosure requirements on fair value measurements. The company will adopt the guidance in 2020 with some items requiring a prospective method and others requiring a retrospective method. The adoption of this guidance is not expected to have a material impact on the company's disclosures.

In February 2018, the FASB issued new guidance to allow reclassifications from accumulated other comprehensive items (AOCI) to retained earnings for certain tax effects on items within AOCI resulting from the Tax Cuts and Jobs Act of 2017 (the Tax Act). The company adopted this guidance in January 2018 and recorded the reclassifications in the period of adoption. The balance sheet impact of adopting this guidance is included in the table below. This guidance only relates to the effects of the Tax Act. For all other tax law changes that have occurred or may occur in the future, the company reclassifies the tax effects to the consolidated statement of income on an item-by-item basis when the pre-tax item in AOCI is reclassified to income.

In December 2017, the SEC staff issued guidance to address the application of accounting guidance in situations when a registrant does not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the Tax Act enacted on December 22, 2017. The company reported provisional amounts in its 2017 financial statements for certain income tax effects of the Tax Act for which a reasonable estimate could be determined. Adjustments to provisional amounts identified during the measurement period, which ended December 22, 2018, are included as adjustments to Provision for Income Taxes in 2018 (Note 8).

In August 2017, the FASB issued new guidance to simplify the application of hedge accounting guidance. Among other things, the new guidance will permit more hedging strategies to qualify for hedge accounting, allow for additional time to perform an initial assessment of a hedge's effectiveness, and permit a qualitative effectiveness test for certain hedges after initial qualification. The company adopted this guidance in January 2018. The balance sheet impact of adopting this guidance is included in the table below.

In October 2016, the FASB issued new guidance eliminating the deferral of the tax effects of intra-entity asset transfers. The impact of this guidance in future periods will be dependent on the extent of future asset transfers which usually occur in connection with planning around acquisitions and other business structuring activities. The balance sheet impact of adopting this guidance as of January 1, 2018 is included in the table below.

In June 2016, the FASB issued new guidance to require a financial asset measured at amortized cost basis, such as accounts receivable, to be presented at the net amount expected to be collected based on relevant information about past events, including historical experience, current conditions, and reasonable and supportable forecasts that affect the collectability of the reported amount. During 2018 and 2019, the FASB issued additional guidance and clarification. The company will adopt the guidance in 2020 using a modified retrospective method. The adoption of this guidance is not expected to have a material impact on the company's consolidated financial statements.

In February 2016, the FASB issued new guidance which requires lessees to record most leases on their balance sheets as lease liabilities, initially measured at the present value of the future lease payments, with corresponding right-of-use assets. The new guidance also sets forth new disclosure requirements related to leases. During 2017 - 2019, the FASB issued additional guidance and clarification. The company adopted this guidance in January 2019. The company elected to adopt the guidance using a modified retrospective method, by applying the transition approach as of the beginning of the period of adoption. Comparative periods have not been restated. As permitted upon transition, the company did not reassess whether any expired or existing contracts were or contained embedded leases, the lease classification for any expired or existing leases, initial direct costs for any leases, or whether land easements met the definition of a lease if they were not accounted for as leases under the prior guidance. Adoption of the new guidance impacted the company's Consolidated Balance Sheet as follows:

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

(In millions)	December 31, 2018 as Reported	Impact of Adopting New Lease Guidance	January 1, 2019 As Adopted
Other Assets	\$ 1,117	\$ 641	\$ 1,758
Other Accrued Expenses	1,470	132	1,602
Other Long-term Liabilities	2,515	505	3,020
Retained Earnings	18,696	4	18,700

In January 2016, the FASB issued new guidance which affects the accounting for equity investments, financial liabilities under the fair value option, and the presentation and disclosure requirements for financial instruments. This guidance requires equity investments to be measured at fair value with subsequent changes recognized in net income, except for those accounted for under the equity method or requiring consolidation. The guidance also changes the accounting for investments without a readily determinable fair value and that do not qualify for the practical expedient permitted by the guidance to estimate fair value. The balance sheet impact of adopting this guidance as of January 1, 2018 is included in the table below.

In May 2014, the FASB issued new revenue recognition guidance which provides a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and supersedes most previous revenue recognition guidance. The new standard also requires significantly expanded disclosures regarding the qualitative and quantitative information of an entity's nature, amount, timing, and uncertainty of revenue and cash flows arising from contracts with customers. During 2016 and 2017, the FASB issued additional guidance and clarification, including the elimination of certain SEC Staff Guidance. The guidance is effective for the company in 2018. The company elected to adopt this guidance through application of the modified retrospective method by applying it to contracts that were not completed as of December 31, 2017 (in addition to new contracts in 2018).

Adoption of new guidance that became effective on January 1, 2018, impacted the company's Consolidated Balance Sheet as follows:

(In millions)	December 31, 2017 as Reported	Impact of Adopting New Revenue Guidance	Impact of Adopting New Equity Investment Guidance	Impact of Adopting New Intra-entity Tax Guidance	Impact of Adopting New Hedge Accounting Guidance	Impact of Adopting New Tax Effects on Items in AOCI Guidance	January 1, 2018 as Adopted
Accounts Receivable, Less Allowances	\$ 3,879	\$ (8)	\$ —	\$ —	\$ —	\$ —	\$ 3,871
Inventories	2,971	(252)	—	—	—	—	2,719
Other Current Assets	1,236	229	—	—	—	—	1,465
Other Assets	1,227	18	—	(77)	—	—	1,168
Deferred Revenue	719	(719)	—	—	—	—	—
Contract Liabilities	—	736	—	—	—	—	736
Other Accrued Expenses	1,848	(153)	—	—	—	—	1,695
Deferred Income Taxes	2,766	—	—	(57)	—	2	2,711
Other Long-term Liabilities	2,569	74	—	—	—	—	2,643
Long-term Obligations	18,873	—	—	—	(3)	—	18,870
Retained Earnings	15,914	49	(1)	(20)	3	87	16,032
Accumulated Other Comprehensive Items	(2,003)	—	1	—	—	(89)	(2,091)

Had the company continued to use the revenue recognition guidance in effect prior to 2018, no material changes would have resulted to the consolidated statements of income, comprehensive income, or cash flows for the year ended December 31, 2018 from amounts reported therein. However, inventories would have been \$357 million higher and other current assets would have been \$359 million lower as of December 31, 2018, primarily as a result of differences in the accounting for pharmaceutical development and manufacturing services under the new revenue guidance. Under the prior guidance, costs of these services were recorded in inventory and revenues were recognized generally when the products were delivered to customers. Under the new guidance, costs are expensed and revenues are recognized as the manufacturing service is performed and the company's rights to consideration are recorded as contract assets.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Note 2. Acquisitions and Dispositions

The company's acquisitions have historically been made at prices above the determined fair value of the acquired identifiable net assets, resulting in goodwill, due to expectations of the synergies that will be realized by combining the businesses. These synergies include the elimination of redundant facilities, functions and staffing; use of the company's existing commercial infrastructure to expand sales of the acquired businesses' products; and use of the commercial infrastructure of the acquired businesses to cost-effectively expand sales of company products.

Acquisitions have been accounted for using the acquisition method of accounting, and the acquired companies' results have been included in the accompanying financial statements from their respective dates of acquisition. Acquisition transaction costs are recorded in selling, general and administrative expenses as incurred.

2019

On April 30, 2019, the company acquired, within the Laboratory Products and Services segment, Brammer Bio for approximately \$1.67 billion in cash. Brammer Bio is a leading viral vector contract development and manufacturing organization for gene and cell therapies. The acquisition expands the segment's contract manufacturing capabilities. Brammer Bio reported revenues of approximately \$140 million in 2018. The purchase price exceeded the fair value of the identifiable net assets and, accordingly, \$938 million was allocated to goodwill, \$405 million of which is tax deductible.

In addition, in 2019 the company acquired, within the Analytical Instruments segment, a Slovakia-based provider of mass spectrometry software used for identification of compounds, and, within the Laboratory Products and Services segment, an active pharmaceutical ingredient (API) manufacturing facility in Cork, Ireland, for an aggregate purchase price of \$169 million.

The components of the purchase price and net assets acquired for 2019 acquisitions are as follows:

(In millions)	Brammer Bio	Other	Total
Purchase Price			
Cash paid	\$ 1,710	\$ 169	\$ 1,879
Cash acquired	(36)	—	(36)
	<u>\$ 1,674</u>	<u>\$ 169</u>	<u>\$ 1,843</u>
Net Assets Acquired			
Current assets	\$ 52	\$ 58	\$ 110
Property, plant and equipment	147	102	249
Definite-lived intangible assets:			
Customer relationships	744	—	744
Product technology	65	7	72
Tradenames	7	—	7
Goodwill	938	9	947
Other assets	49	—	49
Contract liabilities	(110)	—	(110)
Deferred tax liabilities	(110)	(6)	(116)
Other liabilities assumed	(108)	(1)	(109)
	<u>\$ 1,674</u>	<u>\$ 169</u>	<u>\$ 1,843</u>

The weighted-average amortization periods for definite-lived intangible assets acquired in 2019 are 14 years for customer relationships, 13 years for product technology and 2 years for tradenames. The weighted average amortization period for all definite-lived intangible assets acquired in 2019 is 14 years.

2018

On October 25, 2018, the company acquired, within the Life Sciences Solutions segment, Becton Dickinson and Company's Advanced Bioprocessing business for \$477 million in cash. This North America-based business adds complementary cell culture products that expand the segment's bioproduction offerings to help customers increase yield during production of biologic drugs. The Advanced Bioprocessing business reported revenues of \$100 million in 2017. The purchase price exceeded the fair value of the identifiable net assets and, accordingly, \$146 million was allocated to goodwill, all of which is tax deductible.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

In 2018, the company acquired, within the Life Sciences Solutions segment, a North America-based provider of a rapid DNA platform for use in forensics and law enforcement applications, for an aggregate purchase price of \$65 million.

The components of the purchase price and net assets acquired for 2018 acquisitions are as follows:

(In millions)	Advanced Bioprocessing business	Other	Total
Purchase Price			
Cash paid	\$ 477	\$ 55	\$ 532
Fair value of contingent consideration	—	11	11
Cash acquired	—	(1)	(1)
	<u>\$ 477</u>	<u>\$ 65</u>	<u>\$ 542</u>
Net Assets Acquired			
Current assets	\$ 53	\$ 4	\$ 57
Property, plant and equipment	42	—	42
Definite-lived intangible assets:			
Customer relationships	108	—	108
Product technology	132	31	163
Tradenames	8	—	8
Indefinite-lived intangible assets:			
In-process research and development	—	10	10
Goodwill	146	15	161
Other assets	—	14	14
Deferred tax liabilities	(7)	—	(7)
Other liabilities assumed	(5)	(9)	(14)
	<u>\$ 477</u>	<u>\$ 65</u>	<u>\$ 542</u>

The weighted-average amortization periods for definite-lived intangible assets acquired in 2018 are 14 years for customer relationships, 13 years for product technology and 6 years for tradenames. The weighted average amortization period for all definite-lived intangible assets acquired in 2018 is 13 years.

2017

On August 29, 2017, the company acquired, within the Laboratory Products and Services segment, Patheon N.V., a leading global provider of high-quality drug development and delivery solutions to the pharmaceutical and biopharma sectors, for \$35.00 per share in cash, or \$7.36 billion, including the assumption of net debt. The company financed the purchase price, including the repayment of indebtedness of Patheon, with issuances of debt and equity.

Patheon provides comprehensive, integrated and highly customizable solutions as well as the expertise to help biopharmaceutical companies of all sizes satisfy complex development and manufacturing needs. The acquisition provided entry into the pharmaceutical contract development and manufacturing organization market and added a complementary service to the company's existing pharmaceutical services portfolio. Patheon reported revenues of \$1.87 billion for the year ended October 31, 2016. The purchase price exceeded the fair market value of the identifiable net assets and, accordingly, \$3.28 billion was allocated to goodwill, \$125 million of which is tax deductible.

In addition, in 2017 the company acquired, within the Analytical Instruments segment, a North America-based provider of cloud-based platforms supporting scientific data management; within the Life Sciences Solutions segment, a North America-based developer of scalable control automation systems and software for bioproduction; within the Specialty Diagnostics segment, a North America-based molecular diagnostics company offering qPCR tests to the transplant community; and within the Analytical Instruments segment, a provider of desktop scanning electron microscopy solutions and a manufacturer of volatile organic compound monitoring instruments and integrated systems, for an aggregate purchase price of \$425 million.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The components of the purchase price and net assets acquired for 2017 acquisitions are as follows:

(In millions)	Patheon	Other	Total
Purchase Price			
Cash paid	\$ 6,911	\$ 422	\$ 7,333
Debt assumed	488	—	488
Fair value of contingent consideration	—	17	17
Fair value of equity awards exchanged	6	—	6
Fair value of previously held interest	—	11	11
Cash acquired	(47)	(25)	(72)
	<u>\$ 7,358</u>	<u>\$ 425</u>	<u>\$ 7,783</u>
Net Assets Acquired			
Current assets	\$ 1,062	\$ 39	\$ 1,101
Property, plant and equipment	1,242	4	1,246
Definite-lived intangible assets:			
Customer relationships	3,641	90	3,731
Product technology	—	96	96
Tradenames	112	5	117
Indefinite-lived intangible assets:			
In-process research and development	—	2	2
Goodwill	3,276	263	3,539
Other assets	54	—	54
Deferred tax liabilities	(1,093)	(40)	(1,133)
Other liabilities assumed	(936)	(34)	(970)
	<u>\$ 7,358</u>	<u>\$ 425</u>	<u>\$ 7,783</u>

The weighted-average amortization periods for definite-lived intangible assets acquired in 2017 are 17 years for customer relationships, 9 years for product technology and 4 years for tradenames. The weighted average amortization period for all definite-lived intangible assets acquired in 2017 is 16 years.

Unaudited Pro Forma Information

The following unaudited pro forma information provides the effect of the company's 2017 acquisition of Patheon as if the acquisition had occurred on January 1, 2016:

(In millions)	2017
Revenues	\$ 22,144
Net Income	\$ 2,258

To reflect the acquisition of Patheon as if it had occurred on January 1, 2016, the unaudited pro forma results include adjustments to reflect, among other things, the incremental intangible asset amortization to be incurred based on the preliminary values of each identifiable intangible asset and the interest expense from debt financings obtained to partially fund the cash consideration transferred. Pro forma adjustments were tax effected at the company's historical statutory rates in effect for the respective periods. The unaudited pro forma amounts are not necessarily indicative of the combined results of operations that would have been realized had the acquisition and related financings occurred on the aforementioned date, nor are they meant to be indicative of any anticipated combined results of operations that the company will experience after the transaction. In addition, the amounts do not include any adjustments for actions that may be taken following the completion of the transaction, such as expected cost savings, operating synergies, or revenue enhancements that may be realized subsequent to the transaction.

Pro forma net income for the year ended December 31, 2017, excludes certain items associated with the Patheon acquisition that were included in the determination of net income for that period. These items have been included in the determination of pro forma net income for the year ended December 31, 2016 (not presented), and are as follows: \$54 million

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

of direct transaction costs, \$39 million of accounting policy conformity adjustments, \$21 million of initial restructuring costs, \$40 million reduction of revenues for revaluing the deferred revenue obligations to fair value, and \$55 million of expense related to the fair value adjustment to acquisition-date inventories.

The company's results would not have been materially different from its pro forma results had the company's other 2019, 2018 or 2017 acquisitions occurred at the beginning of 2018, 2017 or 2016, respectively.

Disposition

On June 28, 2019, the company sold its Anatomical Pathology business to PHC Holdings Corporation for \$1.13 billion, net of cash divested. The business was part of the Specialty Diagnostics segment. The sale of this business resulted in a pre-tax gain of approximately \$478 million, included in restructuring and other (income) costs, net. Revenues in 2019, through the date of sale, and the full year 2018 of the business sold were approximately \$115 million and \$238 million, respectively, net of retained sales through the company's healthcare market and research and safety market channel businesses. The assets and liabilities of the Anatomical Pathology business were as follows on December 31, 2018:

(In millions)	December 31, 2018
Current Assets	\$ 81
Long-term Assets	528
Current Liabilities	34
Long-term Liabilities	24

Note 3. Revenue

Disaggregated Revenue

Revenue by type is as follows:

(In millions)	2019	2018
Revenues		
Consumables	\$ 13,109	12,576
Instruments	6,387	6,292
Services	6,046	5,490
Consolidated revenues	\$ 25,542	\$ 24,358

Revenue by geographic region is as follows:

(In millions)	2019	2018
Revenues (a)		
North America	\$ 12,896	\$ 12,143
Europe	6,358	6,215
Asia-Pacific	5,524	5,250
Other regions	764	750
Consolidated revenues	\$ 25,542	\$ 24,358

(a) Revenues are attributed to regions based on customer location.

Each reportable segment earns revenues from consumables, instruments and services in North America, Europe, Asia-Pacific and other regions. See note 4 for revenue by reportable segment and other geographic data.

Remaining Performance Obligations

The aggregate amount of the transaction price allocated to the remaining performance obligations for all open customer contracts as of December 31, 2019 was \$7.77 billion. The company will recognize revenue for these performance obligations as they are satisfied, approximately 63% of which is expected to occur within the next twelve months.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Note 4. Business Segment and Geographical Information

The company's financial performance is reported in four segments. A description of each segment follows.

Life Sciences Solutions: provides an extensive portfolio of reagents, instruments and consumables used in biological and medical research, discovery and production of new drugs and vaccines as well as diagnosis of disease. These products and services are used by customers in pharmaceutical, biotechnology, agricultural, clinical, academic, and government markets.

Analytical Instruments: provides a broad offering of instruments, consumables, software and services that are used for a range of applications in the laboratory, on the production line and in the field. These products and services are used by customers in pharmaceutical, biotechnology, academic, government, environmental and other research and industrial markets, as well as the clinical laboratory.

Specialty Diagnostics: provides a wide range of diagnostic test kits, reagents, culture media, instruments and associated products used to increase the speed and accuracy of diagnoses. These products are used by customers in healthcare, clinical, pharmaceutical, industrial and food safety laboratories.

Laboratory Products and Services: provides virtually everything needed for the laboratory, including a combination of self-manufactured and sourced products for customers in research, academic, government, industrial and healthcare settings. The segment also includes a comprehensive offering of outsourced services used by the pharmaceutical and biotech industries for drug development, clinical trials logistics and commercial drug manufacturing.

The company's management evaluates segment operating performance based on operating income before certain charges/credits to cost of revenues and selling, general and administrative expenses, principally associated with acquisition accounting; restructuring and other costs/income including costs arising from facility consolidations such as severance and abandoned lease expense and gains and losses from the sale of real estate and product lines as well as from significant litigation-related matters; and amortization of acquisition-related intangible assets. The company uses this measure because it helps management understand and evaluate the segments' core operating results and facilitates comparison of performance for determining compensation.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Business Segment Information

(In millions)	2019	2018	2017
Revenues			
Life Sciences Solutions	\$ 6,856	\$ 6,269	\$ 5,728
Analytical Instruments	5,522	5,469	4,821
Specialty Diagnostics	3,718	3,724	3,486
Laboratory Products and Services	10,599	10,035	7,825
Eliminations	(1,153)	(1,139)	(942)
Consolidated revenues	<u>25,542</u>	<u>24,358</u>	<u>20,918</u>
Segment Income (a)			
Life Sciences Solutions	2,446	2,158	1,894
Analytical Instruments	1,273	1,247	1,027
Specialty Diagnostics	930	952	927
Laboratory Products and Services	1,324	1,258	1,004
Subtotal reportable segments (a)	<u>5,973</u>	<u>5,615</u>	<u>4,852</u>
Cost of revenues charges, net	(17)	(12)	(123)
Selling, general and administrative charges, net	(62)	(29)	(78)
Restructuring and other income (costs), net	413	(50)	(97)
Amortization of acquisition-related intangible assets	(1,713)	(1,741)	(1,594)
Consolidated operating income	4,594	3,783	2,960
Interest income (b)	224	137	81
Interest expense (b)	(676)	(667)	(592)
Other (expense) income, net (b)	(72)	9	(20)
Income from Continuing Operations Before Income Taxes	<u>\$ 4,070</u>	<u>\$ 3,262</u>	<u>\$ 2,429</u>
Depreciation			
Life Sciences Solutions	\$ 130	\$ 119	\$ 129
Analytical Instruments	75	73	71
Specialty Diagnostics	67	76	72
Laboratory Products and Services	292	258	167
Consolidated depreciation	<u>\$ 564</u>	<u>\$ 526</u>	<u>\$ 439</u>

(a) Represents operating income before certain charges to cost of revenues and selling, general and administrative expenses; restructuring and other costs/income, net; and amortization of acquisition-related intangibles.

(b) The company does not allocate interest or other expense/income, net to its segments.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

(In millions)	2019	2018	2017
Total Assets			
Life Sciences Solutions	\$ 18,306	\$ 18,774	\$ 19,063
Analytical Instruments	9,896	9,907	9,960
Specialty Diagnostics	5,867	6,663	7,095
Laboratory Products and Services	21,761	19,051	19,181
Corporate/Other (c)	2,551	1,837	1,370
Consolidated total assets	<u>\$ 58,381</u>	<u>\$ 56,232</u>	<u>\$ 56,669</u>
Capital Expenditures			
Life Sciences Solutions	\$ 151	\$ 107	\$ 118
Analytical Instruments	64	85	56
Specialty Diagnostics	83	103	87
Laboratory Products and Services	554	374	178
Corporate/Other	74	89	69
Consolidated capital expenditures	<u>\$ 926</u>	<u>\$ 758</u>	<u>\$ 508</u>

(c) Corporate assets consist primarily of cash and cash equivalents and property and equipment at the company's corporate offices.

Geographical Information

(In millions)	2019	2018	2017
Revenues (d)			
United States	\$ 12,366	\$ 11,629	\$ 10,129
China	2,752	2,504	2,060
Other	10,424	10,225	8,729
Consolidated revenues	<u>\$ 25,542</u>	<u>\$ 24,358</u>	<u>\$ 20,918</u>
Long-lived Assets (e)			
United States	\$ 3,099	\$ 2,444	\$ 2,349
Other	2,349	1,721	1,698
Consolidated long-lived assets	<u>\$ 5,448</u>	<u>\$ 4,165</u>	<u>\$ 4,047</u>

(d) Revenues are attributed to countries based on customer location.

(e) Includes property, plant and equipment, net, and beginning in 2019, operating lease right-of-use assets.

Note 5. Other Expense/Income, Net

In all periods, other expense, net includes currency transaction gains and losses on monetary assets and liabilities and net periodic pension benefit cost/income, excluding the service cost component which is included in operating expenses on the accompanying statement of income. In 2019, other expense, net includes \$184 million of losses on the early extinguishment of debt (see Note 10), offset in part by \$44 million of net gains on investments. The investment gains include a \$28 million gain on the sale of a joint venture for net proceeds of \$42 million.

In 2018, other expense, net also includes \$15 million of net losses on investments.

In 2017, other expense, net includes \$32 million of charges related to amortization of fees paid to obtain bridge financing commitments related to the Patheon acquisition (Note 2) and \$4 million of losses on the early extinguishment of debt, offset in part by \$17 million of net gains on investments.

THERMO FISHER SCIENTIFIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Note 6. Stock-based Compensation Expense

The company has stock-based compensation plans for its key employees, directors and others. These plans permit the grant of a variety of stock and stock-based awards, including restricted stock units, stock options or performance-based shares, as determined by the compensation committee of the company's Board of Directors or, for certain non-officer grants, by the company's employee equity committee, which consists of its chief executive officer. The company generally issues new shares of its common stock to satisfy option exercises and restricted unit vestings. Grants of stock options and restricted units generally provide that in the event of both a change in control of the company and a qualifying termination of an option or unit holder's employment, all options and service-based restricted unit awards held by the recipient become immediately vested (unless an employment or other agreement with the employee provides for different treatment).

Compensation cost is based on the grant-date fair value and is recognized ratably over the requisite vesting period or to the date based on qualifying retirement eligibility, if earlier.

Stock-based compensation expense is primarily included in selling, general and administrative expenses.

(In millions)	2019	2018	2017
Stock-based Compensation Expense	\$ 181	\$ 181	\$ 159

Stock Options

The company's practice is to grant stock options at fair market value. Options vest over 3-5 years with terms of 7-10 years, assuming continued employment with certain exceptions. Vesting of the option awards is contingent upon meeting certain service conditions. The fair value of most option grants is estimated using the Black-Scholes option pricing model. For option grants that require the achievement of both service and market conditions, a lattice model is used to estimate fair value. The fair value is then amortized on a straight-line basis over the requisite service periods of the awards, which is generally the vesting period. Use of a valuation model requires management to make certain assumptions with respect to selected model inputs. Expected volatility was calculated based on the historical volatility of the company's stock. Historical data on exercise patterns is the basis for estimating the expected life of an option. The risk-free interest rate is based on U.S. Treasury zero-coupon issues with a remaining term which approximates the expected life assumed at the date of grant. The expected annual dividend rate was calculated by dividing the company's annual dividend, based on the most recent quarterly dividend rate, by the closing stock price on the grant date. The compensation expense recognized for all stock-based awards is net of estimated forfeitures. Forfeitures are estimated based on an analysis of actual option forfeitures.

The weighted average assumptions used in the Black-Scholes option pricing model are as follows:

	2019	2018	2017
Expected Stock Price Volatility	21 %	20 %	20 %
Risk Free Interest Rate	2.4 %	2.6 %	1.9 %
Expected Life of Options (years)	4.3	4.3	4.3
Expected Annual Dividend	0.3 %	0.3 %	0.4 %

The weighted average per share grant-date fair values of options granted during 2019, 2018 and 2017 were \$53.37, \$43.45 and \$30.73, respectively. The total intrinsic value of options exercised during the same periods was \$320 million, \$312 million and \$199 million, respectively. The intrinsic value is the difference between the market value of the shares on the exercise date and the exercise price of the option.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

A summary of the company's option activity for the year ended December 31, 2019 is presented below:

	Shares (in millions)	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (a) (in millions)
Outstanding at December 31, 2018	8.0	\$ 148.09		
Granted	1.3	256.61		
Exercised	(2.0)	111.13		
Canceled/Expired	(0.4)	193.78		
Outstanding at December 31, 2019	<u>6.9</u>	\$ 176.26	4.1	
Vested and Unvested Expected to Vest at December 31, 2019	<u>6.6</u>	\$ 174.33	4.1	\$ 992
Exercisable at December 31, 2019	<u>3.1</u>	\$ 141.20	2.9	\$ 561

As of December 31, 2019, there was \$95 million of total unrecognized compensation cost related to unvested stock options granted. The cost is expected to be recognized through 2023 with a weighted average amortization period of 2.2 years.

Restricted Share/Unit Awards

Awards of restricted units convert into an equivalent number of shares of common stock. The awards generally vest over 3-4 years, assuming continued employment, with some exceptions. Vesting of the awards is contingent upon meeting certain service conditions and may also be contingent upon meeting certain performance and/or market conditions. The fair market value of the award at the time of the grant is amortized to expense over the requisite service period of the award, which is generally the vesting period. Recipients of restricted units have no voting rights but are entitled to accrue dividend equivalents. The fair value of service- and performance-based restricted unit awards is determined based on the number of units granted and the market value of the company's shares on the grant date. For awards with market-based vesting conditions, the company uses a lattice model to estimate the grant-date fair value of the award.

A summary of the company's restricted unit activity for the year ended December 31, 2019 is presented below:

	Units (in millions)	Weighted Average Grant-Date Fair Value
Unvested at December 31, 2018	1.2	\$ 177.04
Granted	0.6	248.10
Vested	(0.7)	173.61
Forfeited	(0.1)	198.73
Unvested at December 31, 2019	<u>1.0</u>	\$ 218.34

The total fair value of shares vested during 2019, 2018 and 2017 was \$118 million, \$114 million and \$97 million, respectively.

As of December 31, 2019, there was \$141 million of total unrecognized compensation cost related to unvested restricted stock unit awards. The cost is expected to be recognized through 2023 with a weighted average amortization period of 1.9 years.

Employee Stock Purchase Plans

Qualifying employees are eligible to participate in an employee stock purchase plan sponsored by the company. Shares may be purchased under the program at 95% of the fair market value at the end of the purchase period and the shares purchased are not subject to a holding period. Shares are purchased through payroll deductions of up to 10% of each participating

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

employee's qualifying gross wages. The company issued 0.2 million, 0.1 million and 0.1 million shares, respectively, of its common stock in 2019, 2018 and 2017 under the employee stock purchase plan.

Note 7. Pension and Other Postretirement Benefit Plans

401(k) Savings Plan and Other Defined Contribution Plans

The company's 401(k) savings and other defined contribution plans cover the majority of the company's eligible U.S. and certain non-U.S. employees. Contributions to the plans are made by both the employee and the company. Company contributions are based on the level of employee contributions. Company contributions to these plans are based on formulas determined by the company. In 2019, 2018 and 2017, the company charged to expense \$232 million, \$204 million and \$161 million, respectively, related to its defined contribution plans.

Defined Benefit Pension Plans

Employees of a number of the company's non-U.S. and certain U.S. subsidiaries participate in defined benefit pension plans covering substantially all full-time employees at those subsidiaries. Some of the plans are unfunded, as permitted under the plans and applicable laws. The company also maintains postretirement healthcare programs at several acquired businesses where certain employees are eligible to participate. The costs of the postretirement healthcare programs are generally funded on a self-insured and insured-premium basis.

The company recognizes the funded status of defined benefit pension and other postretirement benefit plans as an asset or liability. This amount is defined as the difference between the fair value of plan assets and the benefit obligation. The company is required to recognize as a component of other comprehensive items, net of tax, the actuarial gains/losses and prior service costs/credits that arise but were not previously required to be recognized as components of net periodic benefit cost. Other comprehensive items is adjusted as these amounts are later recognized in income as components of net periodic benefit cost.

When a company with a pension plan is acquired, any excess of projected benefit obligation over the plan assets is recognized as a liability and any excess of plan assets over the projected benefit obligation is recognized as an asset. The recognition of a new liability or a new asset results in the elimination of (a) previously existing unrecognized net gain or loss and (b) unrecognized prior service cost or credits.

The company funds annually, at a minimum, the statutorily required minimum amount as actuarially determined. During 2019, 2018 and 2017, the company made cash contributions of approximately \$50 million, \$93 million and \$200 million, respectively. Contributions to the plans included in the following table are estimated at between \$40 and \$60 million for 2020.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The following table provides a reconciliation of benefit obligations and plan assets of the company's domestic and non-U.S. pension plans and postretirement benefit plans:

(In millions)	Domestic Pension Benefits		Non-U.S. Pension Benefits		Postretirement Benefits	
	2019	2018	2019	2018	2019	2018
Change in Projected Benefit Obligations						
Benefit Obligation at Beginning of Year	\$ 1,179	\$ 1,300	\$ 1,193	\$ 1,324	\$ 50	\$ 63
Business combinations/divestiture	—	8	(23)	—	—	1
Service costs	—	—	23	26	1	1
Interest costs	45	41	24	23	2	2
Settlements	—	—	(34)	(33)	—	—
Plan participants' contributions	—	—	5	5	—	—
Actuarial (gains) losses	156	(87)	136	(48)	3	(8)
Benefits paid	(78)	(83)	(27)	(34)	(2)	(2)
Currency translation and other	—	—	6	(70)	1	(7)
Benefit Obligation at End of Year	<u>\$ 1,302</u>	<u>\$ 1,179</u>	<u>\$ 1,303</u>	<u>\$ 1,193</u>	<u>\$ 55</u>	<u>\$ 50</u>
Change in Fair Value of Plan Assets						
Fair Value of Plan Assets at Beginning of Year	\$ 1,091	\$ 1,181	\$ 932	\$ 1,011	\$ 8	\$ 9
Business combinations/divestiture	—	7	(15)	—	—	—
Actual return on plan assets	183	(49)	60	(21)	2	(1)
Employer contribution	5	35	43	56	2	2
Settlements	—	—	(34)	(33)	—	—
Plan participants' contributions	—	—	5	5	—	—
Benefits paid	(78)	(83)	(27)	(34)	(2)	(2)
Currency translation and other	—	—	22	(52)	—	—
Fair Value of Plan Assets at End of Year	<u>\$ 1,201</u>	<u>\$ 1,091</u>	<u>\$ 986</u>	<u>\$ 932</u>	<u>\$ 10</u>	<u>\$ 8</u>
Funded Status	<u>\$ (101)</u>	<u>\$ (88)</u>	<u>\$ (317)</u>	<u>\$ (261)</u>	<u>\$ (45)</u>	<u>\$ (42)</u>
Accumulated Benefit Obligation	<u>\$ 1,302</u>	<u>\$ 1,179</u>	<u>\$ 1,238</u>	<u>\$ 1,136</u>		
Amounts Recognized in Balance Sheet						
Noncurrent assets	\$ —	\$ —	\$ 97	\$ 106	\$ 9	\$ 8
Current liability	(6)	(6)	(8)	(8)	(3)	(3)
Noncurrent liabilities	(95)	(82)	(406)	(359)	(51)	(47)
Net amount recognized	<u>\$ (101)</u>	<u>\$ (88)</u>	<u>\$ (317)</u>	<u>\$ (261)</u>	<u>\$ (45)</u>	<u>\$ (42)</u>
Amounts Recognized in Accumulated Other Comprehensive Items						
Net actuarial loss	\$ 195	\$ 168	\$ 200	\$ 106	\$ 5	\$ 4
Prior service credits	—	—	(3)	5	(5)	(5)
Net amount recognized	<u>\$ 195</u>	<u>\$ 168</u>	<u>\$ 197</u>	<u>\$ 111</u>	<u>\$ —</u>	<u>\$ (1)</u>

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The actuarial assumptions used to compute the funded status for the plans are based upon information available as of December 31, 2019 and 2018 and are as follows:

	Domestic Pension Benefits		Non-U.S. Pension Benefits		Postretirement Benefits	
	2019	2018	2019	2018	2019	2018
Weighted Average Assumptions Used to Determine Projected Benefit Obligations						
Discount rate	3.12 %	4.21 %	1.60 %	2.34 %	2.86 %	3.81 %
Average rate of increase in employee compensation	N/A	N/A	2.27 %	2.47 %	N/A	N/A
Initial healthcare cost trend rate					5.98 %	6.35 %
Ultimate healthcare cost trend rate					4.48 %	4.89 %

The actuarial assumptions used to compute the net periodic pension benefit cost (income) are based upon information available as of the beginning of the year, as presented in the following table:

	Domestic Pension Benefits			Non-U.S. Pension Benefits		
	2019	2018	2017	2019	2018	2017
Weighted Average Assumptions Used to Determine Net Benefit Cost (Income)						
Discount rate	4.22 %	3.54 %	4.06 %	2.34 %	2.10 %	1.95 %
Average rate of increase in employee compensation	N/A	N/A	N/A	2.47 %	2.59 %	3.10 %
Expected long-term rate of return on assets	5.76 %	5.75 %	6.50 %	3.25 %	3.31 %	3.11 %

The ultimate healthcare cost trend rates for the postretirement benefit plans are expected to be reached between 2020 and 2040.

The discount rate reflects the rate the company would have to pay to purchase high-quality investments that would provide cash sufficient to settle its current pension obligations. The discount rate is determined based on a range of factors, including the rates of return on high-quality, fixed-income corporate bonds and the related expected duration of the obligations or, in certain instances, the company has used a hypothetical portfolio of high quality instruments with maturities that mirror the benefit obligation in order to accurately estimate the discount rate relevant to a particular plan.

The company utilizes a full yield curve approach in the estimation of these components by applying the specific spot-rates along the yield curve used in the determination of the benefit obligation to the relevant projected cash flows.

The expected long-term rate of return on plan assets reflects the average rate of earnings expected on the funds invested, or to be invested, to provide for the benefits included in the projected benefit obligations. In determining the expected long-term rate of return on plan assets, the company considers the relative weighting of plan assets, the historical performance of total plan assets and individual asset classes and economic and other indicators of future performance. In addition, the company may consult with and consider the opinions of financial and other professionals in developing appropriate return benchmarks.

Asset management objectives include maintaining an adequate level of diversification to reduce interest rate and market risk and providing adequate liquidity to meet immediate and future benefit payment requirements.

The expected rate of compensation increase reflects the long-term average rate of salary increases and is based on historic salary increase experience and management's expectations of future salary increases.

The amounts in accumulated other comprehensive items expected to be recognized as components of net periodic benefit cost in 2020 are not material.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The projected benefit obligation and fair value of plan assets for the company's qualified and non-qualified pension plans with projected benefit obligations in excess of plan assets are as follows:

(In millions)	Pension Plans	
	2019	2018
Pension Plans with Projected Benefit Obligations in Excess of Plan Assets		
Projected benefit obligation	\$ 2,072	\$ 1,876
Fair value of plan assets	1,557	1,421

The accumulated benefit obligation and fair value of plan assets for the company's qualified and non-qualified pension plans with accumulated benefit obligations in excess of plan assets are as follows:

(In millions)	Pension Plans	
	2019	2018
Pension Plans with Accumulated Benefit Obligations in Excess of Plan Assets		
Accumulated benefit obligation	\$ 1,976	\$ 1,792
Fair value of plan assets	1,525	1,393

The measurement date used to determine benefit information is December 31 for all plan assets and benefit obligations.

The net periodic pension benefit cost (income) includes the following components:

(In millions)	Domestic Pension Benefits			Non-U.S. Pension Benefits		
	2019	2018	2017	2019	2018	2017
Components of Net Benefit Cost (Income)						
Service cost-benefits earned	\$ —	\$ —	\$ —	\$ 23	\$ 26	\$ 26
Interest cost on benefit obligation	45	41	43	24	23	21
Expected return on plan assets	(55)	(55)	(56)	(30)	(32)	(29)
Amortization of actuarial net loss	2	3	2	6	7	9
Amortization of prior service benefit	—	—	—	(1)	—	—
Settlement/curtailment loss	—	—	1	4	7	5
Net periodic benefit cost (income)	<u>\$ (8)</u>	<u>\$ (11)</u>	<u>\$ (10)</u>	<u>\$ 26</u>	<u>\$ 31</u>	<u>\$ 32</u>

The net periodic postretirement benefit cost was not material in 2019, 2018 and 2017.

Expected benefit payments are estimated using the same assumptions used in determining the company's benefit obligation at December 31, 2019. Benefit payments will depend on future employment and compensation levels, average years employed and average life spans, among other factors, and changes in any of these factors could significantly affect these estimated future benefit payments. Estimated future benefit payments during the next five years and in the aggregate for the five fiscal years thereafter, are as follows:

(In millions)	Domestic Pension Benefits	Non-U.S. Pension Benefits	Post-retirement Benefits
Expected Benefit Payments			
2020	\$ 90	\$ 34	\$ 2
2021	90	37	2
2022	87	38	2
2023	86	41	2
2024	85	45	2
2025-2029	390	250	8

A change in the assumed healthcare cost trend rate by one percentage point effective January 2019 would not have caused a material change in the accumulated postretirement benefit obligation as of December 31, 2019 and the 2019 aggregate of service and interest costs.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Domestic Pension Plan Assets

The company's overall objective is to manage the assets in a liability framework where investments are selected that are expected to have similar changes in fair value as the related liabilities will have upon changes in interest rates. The company invests in a portfolio of both return-seeking and liability-hedging assets, primarily through the use of institutional collective funds, to achieve long-term growth and to insulate the funded position from interest rate volatility. The strategic asset allocation uses a combination of risk controlled and index strategies in fixed income and global equities. The target allocations for the investments are approximately 10% to funds investing in U.S. equities, approximately 10% to funds investing in international equities and approximately 80% to funds investing in fixed income securities. The portfolio maintains enough liquidity at all times to meet the near-term benefit payments.

Non-U.S. Pension Plan Assets

The company maintains specific plan assets for many of the individual pension plans outside the U.S. The investment strategy of each plan has been uniquely established based on the country specific standards and characteristics of the plans. Several of the plans have contracts with insurance companies whereby the market risks of the benefit obligations are borne by the insurance companies. When assets are held directly in investments, generally the objective is to invest in a portfolio of diversified assets with a variety of fund managers. The investments may include equity funds, fixed income funds, hedge funds, multi-asset funds, alternative investments and derivative funds with the target asset allocations ranging from approximately 0% - 25% for equity funds, 0% - 70% for fixed income funds, 0% - 20% for hedge funds, 0% - 100% for multi-asset funds, 0% to 5% for alternative investments and 0% - 30% for funds holding derivatives. The derivatives held by the funds are primarily interest rate swaps intended to match the movements in the plan liabilities as well as equity futures in a synthetic equity fund which provide targeted exposure to equity markets without the fund holding individual equity positions. Each plan maintains enough liquidity at all times to meet the near-term benefit payments.

The fair values of the company's plan assets at December 31, 2019 and 2018, by asset category are as follows:

(In millions)	December 31, 2019	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Not Subject to Leveling (1)
Domestic Pension Plan Assets					
U.S. equity funds	\$ 122	\$ —	\$ —	\$ —	\$ 122
International equity funds	116	—	—	—	116
Fixed income funds	951	—	—	—	951
Money market funds	12	—	—	—	12
Total Domestic Pension Plans	\$ 1,201	\$ —	\$ —	\$ —	\$ 1,201
Non-U.S. Pension Plan Assets					
Equity funds	\$ 37	\$ —	\$ —	\$ —	\$ 37
Fixed income funds	430	—	—	—	430
Hedge funds	61	—	—	—	61
Multi-asset funds	76	—	—	—	76
Derivative funds	129	—	—	—	129
Alternative investments	4	—	—	—	4
Insurance contracts	237	—	237	—	—
Cash / money market funds	12	9	—	—	3
Total Non-U.S. Pension Plans	\$ 986	\$ 9	\$ 237	\$ —	\$ 740

(1) Investments measured at the net asset value per share (or its equivalent) practical expedient have not been classified in the fair value hierarchy.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

(In millions)	December 31, 2018	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Not Subject to Leveling (1)
Domestic Pension Plan Assets					
U.S. equity funds	\$ 104	\$ —	\$ —	\$ —	\$ 104
International equity funds	103	—	—	—	103
Fixed income funds	868	—	—	—	868
Money market funds	16	—	—	—	16
Total Domestic Pension Plans	\$ 1,091	\$ —	\$ —	\$ —	\$ 1,091
Non-U.S. Pension Plan Assets					
Equity funds	\$ 43	\$ —	\$ —	\$ —	\$ 43
Fixed income funds	299	—	—	—	299
Hedge funds	61	—	—	—	61
Multi-asset funds	97	—	—	—	97
Derivative funds	169	—	—	—	169
Alternative investments	20	—	—	—	20
Insurance contracts	237	—	237	—	—
Cash / money market funds	6	5	—	—	1
Total Non-U.S. Pension Plans	\$ 932	\$ 5	\$ 237	\$ —	\$ 690

(1) Investments measured at the net asset value per share (or its equivalent) practical expedient have not been classified in the fair value hierarchy.

The tables above present the fair value of the company's plan assets in accordance with the fair value hierarchy (Note 14). Certain investments that are measured at fair value using the net asset value per share practical expedient have not been classified in the fair value hierarchy. The fair value amounts of these investments presented in the above tables are intended to permit reconciliation of the fair value hierarchy to the amounts presented for the total pension plan assets. These investments were also redeemable at the balance sheet date or within limited time restrictions.

Note 8. Income Taxes

The components of income from continuing operations before provision for income taxes are as follows:

(In millions)	2019	2018	2017
U.S.	\$ 2,278	\$ 1,329	\$ 655
Non-U.S.	1,792	1,933	1,774
Income from Continuing Operations	\$ 4,070	\$ 3,262	\$ 2,429

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The components of the provision for income taxes of continuing operations are as follows:

(In millions)	2019	2018	2017
Current Income Tax Provision			
Federal	\$ 267	\$ 165	\$ 1,259
Non-U.S.	544	574	576
State	62	59	62
	<u>873</u>	<u>798</u>	<u>1,897</u>
Deferred Income Tax Provision (Benefit)			
Federal	\$ (222)	\$ (258)	\$ (1,437)
Non-U.S.	(252)	(187)	(271)
State	(25)	(29)	12
	<u>(499)</u>	<u>(474)</u>	<u>(1,696)</u>
Provision for Income Taxes	<u>\$ 374</u>	<u>\$ 324</u>	<u>\$ 201</u>

The provision for income taxes in the accompanying statement of income differs from the provision calculated by applying the statutory federal income tax rate to income from continuing operations before provision for income taxes due to the following:

(In millions)	2019	2018	2017
Statutory Federal Income Tax Rate	21 %	21 %	35 %
Provision for Income Taxes at Statutory Rate	\$ 855	\$ 685	\$ 850
Increases (Decreases) Resulting From:			
Foreign rate differential	(204)	(375)	(380)
Foreign exchange loss on inter-company debt refinancing	(62)	—	(237)
Income tax credits	(379)	(349)	(273)
Withholding taxes	38	31	55
Global intangible low-taxed income	258	167	—
Foreign-derived intangible income	(111)	(47)	—
Impact of change in tax laws and apportionment on deferred taxes	6	(12)	(1,121)
Transition tax and other impacts of U.S. tax reform	8	117	1,250
Provision for (reversal of) tax reserves, net	62	(49)	99
Excess tax benefits from stock options and restricted stock units	(80)	(77)	(65)
Basis difference on disposal of business	73	—	—
Valuation allowance	(4)	260	7
Intra-entity transfers	(79)	—	—
Other, net	(7)	(27)	16
Provision for Income Taxes	<u>\$ 374</u>	<u>\$ 324</u>	<u>\$ 201</u>

The company has operations and a taxable presence in approximately 50 countries outside the U.S. The company's effective income tax rate differs from the U.S. federal statutory rate each year due to certain operations that are subject to tax incentives, state and local taxes, and foreign taxes that are different than the U.S. federal statutory rate.

U.S. Tax Reform Impacts

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 was enacted. The Tax Act includes significant changes to existing U.S. tax laws that affect the company, including a reduction of the U.S. corporate income tax rate from 35% to 21% beginning in 2018 and creation of a territorial tax system with a one-time transition tax on deemed repatriated earnings and profits of foreign subsidiaries (transition tax). As detailed below, the company recognized a net charge of \$204 million for certain aspects of the Tax Act in its 2017 financial statements for which the accounting was provisional, but a reasonable

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

estimate could be determined. During 2018, the company completed its accounting for the income tax effects of the Tax Act and recognized net adjustments (detailed below) to the provisional amounts, totaling a net charge of \$68 million, as a component of income tax expense.

The transition tax is based on the company's total post-1986 earnings and profits, the tax on which was previously deferred from U.S. income taxes under U.S. law. The company recorded a provisional amount for the transition tax liability for each of the foreign subsidiaries, resulting in a total transition liability of \$1.25 billion at December 31, 2017. After further analysis of new U.S. Treasury guidance, available tax accounting methods and elections, legislative updates, regulations, earnings and profits computations and foreign taxes, the company finalized the calculations of the transition tax liability during 2018. The increase in the liability for the transition tax in 2018 consisted of an incremental provision of \$117 million offset in part by a \$49 million reduction of related unrecognized tax benefits established in 2017.

In 2017, as a result of the Tax Act, the company remeasured certain deferred tax assets and liabilities based on the rates at which they were expected to reverse in the future (which was generally 21%), by recording a provisional tax benefit of \$1.06 billion. During 2018, no material changes to this provisional amount were made.

The Tax Act included a provision for global intangible low-taxed income. The company has adopted a policy to account for this provision as a period cost.

During 2019, the company recorded a net tax provision of \$1 million to adjust the impacts of U.S. tax reform based on final regulations issued by the U.S. Treasury in 2019. The income tax provision consists of an incremental charge of \$8 million offset by a \$7 million reduction of related unrecognized tax benefits.

Other Tax Impacts

In 2019, the company recorded a \$62 million income tax benefit, including both U.S. federal and state taxes, related to a foreign exchange loss for tax purposes on certain intercompany financing arrangements as well as a tax provision of \$191 million related to the gain on the sale of the Anatomical Pathology business. Also in 2019, the company recorded a \$79 million benefit related to the deferred tax implications of intra-entity transactions which included a tax benefit to release a valuation allowance against net operating losses previously determined to be unrealizable.

In 2018, the provision for income taxes also included a \$71 million charge to establish a valuation allowance against net operating losses that will not be utilized as a result of the 2019 sale of the Anatomical Pathology business (Note 2).

The foreign tax credits discussed below are the result of foreign earnings and profits remitted or deemed remitted to the U.S. during the reporting year and the U.S. treatment of taxes paid in the foreign jurisdictions in the years those profits were originally earned.

In 2019, the company implemented foreign tax credit planning in Sweden which resulted in \$75 million of foreign tax credits, with no related incremental U.S. income tax expense.

In 2017, the company continued to implement tax planning initiatives related to non U.S. subsidiaries. These non-U.S. subsidiaries incurred foreign tax obligations, and made cash and deemed distributions to the company's U.S. operations which resulted in no net tax cost. As a result of these distributions, the company benefited from U.S. foreign tax credits of \$86 million, offset in part by additional U.S. income taxes of \$53 million on the related foreign income (which reduced the benefit from the foreign rate differential in 2017). The company also implemented foreign tax credit planning in Sweden which resulted in \$20 million of foreign tax credits, with no related incremental U.S. income tax expense. In 2017, the company refinanced certain long term inter-company debt which resulted in an income tax benefit of \$237 million related to a foreign exchange loss recognized for income tax purposes.

The company generally receives a tax deduction upon the exercise of non-qualified stock options by employees, or the vesting of restricted stock units held by employees, for the difference between the exercise price and the market price of the underlying common stock on the date of exercise. The company uses the incremental tax benefit approach for utilization of tax attributes. These excess tax benefits reduce the tax provision. In 2019, 2018 and 2017, the company's tax provision was reduced by \$80 million, \$77 million and \$65 million, respectively, of such benefits.

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Net deferred tax asset (liability) in the accompanying balance sheet consists of the following:

(In millions)	2019	2018
Deferred Tax Asset (Liability)		
Depreciation and amortization	\$ (3,084)	\$ (3,444)
Net operating loss and credit carryforwards	1,231	1,311
Reserves and accruals	144	148
Accrued compensation	261	250
Inventory basis difference	99	105
Other capitalized costs	71	103
Unrealized losses on hedging instruments	10	23
Other, net	57	143
Deferred tax assets (liabilities), net before valuation allowance	(1,211)	(1,361)
Less: Valuation allowance	408	471
Deferred tax assets (liabilities), net	<u>\$ (1,619)</u>	<u>\$ (1,832)</u>

The company estimates the degree to which tax assets and loss and credit carryforwards will result in a benefit based on expected profitability by tax jurisdiction and provides a valuation allowance for tax assets and loss and credit carryforwards that it believes will more likely than not expire unutilized. At December 31, 2019, all of the company's valuation allowance relates to deferred tax assets, primarily net operating losses, for which any subsequently recognized tax benefits will reduce income tax expense.

The changes in the valuation allowance are as follows:

(In millions)	Year Ended December 31,		
	2019	2018	2017
Beginning Balance	\$ 471	\$ 256	\$ 113
(Reductions) additions charged to income tax provision, net	(27)	223	28
Additions due to acquisitions	—	17	108
Reduction due to a divestiture	(33)	—	—
Deductions	—	(15)	—
Currency translation and other	(3)	(10)	7
Ending Balance	<u>\$ 408</u>	<u>\$ 471</u>	<u>\$ 256</u>

At December 31, 2019, the company had federal, state and non-U.S. net operating loss carryforwards of \$282 million, \$1.73 billion and \$4.82 billion, respectively. Use of the carryforwards is limited based on the future income of certain subsidiaries. The federal and state net operating loss carryforwards expire in the years 2020 through 2039. Of the non-U.S. net operating loss carryforwards, \$1.98 billion expire in the years 2024 through 2039, and the remainder do not expire.

As a result of the Tax Act, U.S. federal taxes have been recorded on \$15 billion of undistributed foreign earnings as of December 31, 2019. A provision has not been made for certain U.S. state income taxes or additional non-U.S. taxes that would be due when cash is repatriated to the U.S. as the company's undistributed foreign earnings are intended to be reinvested outside of the U.S. indefinitely. The determination of the amount of the unrecognized deferred tax liability related to the undistributed foreign earnings is not practicable due to the uncertainty in the manner in which these earnings will be distributed. The company's intent is to only make distributions from non-U.S. subsidiaries in the future when they can be made at no net tax cost.

Unrecognized Tax Benefits

As of December 31, 2019, the company had \$1.55 billion of unrecognized tax benefits which, if recognized, would reduce the effective tax rate.

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

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

(In millions)	2019	2018	2017
Beginning Balance	\$ 1,442	\$ 1,409	\$ 802
Additions due to acquisitions	—	—	31
Reductions due to acquisitions	—	(5)	—
Additions for tax positions of current year	53	48	565
Additions for tax positions of prior years	69	82	51
Reductions for tax positions of prior years	(7)	—	—
Closure of tax years	—	(5)	—
Settlements	(5)	(87)	(40)
Ending Balance	<u>\$ 1,552</u>	<u>\$ 1,442</u>	<u>\$ 1,409</u>

Substantially all of the total \$1.55 billion liability is classified as a long-term liability. The company does not expect its unrecognized tax benefits to change significantly over the next twelve months.

During 2019, the company's unrecognized tax benefits increased \$70 million as a result of uncertain tax positions relating to foreign tax positions and \$45 million relating to U.S. federal and state tax positions.

During 2018, the company's unrecognized tax benefits increased \$85 million as a result of uncertain tax positions relating to foreign tax positions and \$45 million relating to U.S. federal and state tax positions.

During 2017, the company's unrecognized tax benefits provisionally increased \$511 million as a result of uncertain tax positions relating to the scope of the Tax Act's one-time transition tax, \$54 million relating to foreign tax positions, \$43 million as a result of a foreign exchange loss recognized on the refinancing of certain long term inter-company debt and \$31 million due to an acquisition.

The company classified interest and penalties related to unrecognized tax benefits as income tax expense. The total amount of interest and penalties related to uncertain tax positions and recognized in the balance sheet as of December 31, 2019 and 2018 was \$67 million and \$59 million, respectively.

The company conducts business globally and, as a result, Thermo Fisher or one or more of its subsidiaries files income tax returns in the U.S. federal jurisdiction and various state and foreign jurisdictions. In the normal course of business, the company is subject to examination by taxing authorities throughout the world, including such major jurisdictions as Australia, Canada, China, Denmark, Finland, France, Germany, Japan, Singapore, Sweden, the United Kingdom and the United States. With few exceptions, the company is no longer subject to U.S. federal, state and local, or non-U.S., income tax examinations for years before 2011.

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Note 9. Earnings per Share

(In millions except per share amounts)

	2019	2018	2017
Income from Continuing Operations	\$ 3,696	\$ 2,938	\$ 2,228
Loss from Discontinued Operations	—	—	(3)
Net Income	\$ 3,696	\$ 2,938	\$ 2,225
Basic Weighted Average Shares	400	402	395
Plus Effect of:			
Stock options and restricted units	3	4	3
Diluted Weighted Average Shares	403	406	398
Basic Earnings per Share:			
Continuing operations	\$ 9.24	\$ 7.31	\$ 5.65
Discontinued operations	—	—	(0.01)
Basic Earnings per Share	\$ 9.24	\$ 7.31	\$ 5.64
Diluted Earnings per Share:			
Continuing operations	\$ 9.17	\$ 7.24	\$ 5.60
Discontinued operations	—	—	(0.01)
Diluted Earnings per Share	\$ 9.17	\$ 7.24	\$ 5.59
Antidilutive Stock Options Excluded from Diluted Weighted Average Shares	1	2	2

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Note 10. Debt and Other Financing Arrangements

(Dollars in millions)	Effective Interest Rate at December 31, 2019	December 31, 2019	December 31, 2018
Commercial Paper		\$ —	\$ 693
Floating Rate 2-Year Senior Notes, Due 7/24/2019 (euro-denominated)		—	574
6.00% 10-Year Senior Notes, Due 3/1/2020		—	750
4.70% 10-Year Senior Notes, Due 5/1/2020		—	300
Floating Rate 2-Year Senior Notes, Due 8/7/2020 (euro-denominated)	0.17 %	673	688
1.50% 5-Year Senior Notes, Due 12/1/2020 (euro-denominated)		—	487
5.00% 10-Year Senior Notes, Due 1/15/2021		—	400
4.50% 10-Year Senior Notes, Due 3/1/2021		—	1,000
3.60% 10-Year Senior Notes, Due 8/15/2021		—	1,100
3.30% 7-Year Senior Notes, Due 2/15/2022		—	800
2.15% 7-Year Senior Notes, Due 7/21/2022 (euro-denominated)	2.28 %	561	574
3.15% 10-Year Senior Notes, Due 1/15/2023		—	800
3.00% 7-Year Senior Notes, Due 4/15/2023	5.02 %	1,000	1,000
4.15% 10-Year Senior Notes, Due 2/1/2024	4.16 %	1,000	1,000
0.75% 8-Year Senior Notes, Due 9/12/2024 (euro-denominated)	0.94 %	1,121	1,147
0.125% 5.5-Year Senior Notes, Due 3/1/2025 (euro-denominated)	0.41 %	897	—
2.00% 10-Year Senior Notes, Due 4/15/2025 (euro-denominated)	2.10 %	717	734
3.65% 10-Year Senior Notes, Due 12/15/2025	3.77 %	350	350
1.40% 8.5-Year Senior Notes, Due 1/23/2026 (euro-denominated)	1.53 %	785	802
2.95% 10-Year Senior Notes, Due 9/19/2026	3.19 %	1,200	1,200
1.45% 10-Year Senior Notes, Due 3/16/2027 (euro-denominated)	1.65 %	561	574
3.20% 10-Year Senior Notes, Due 8/15/2027	3.39 %	750	750
0.50% 8.5-Year Senior Notes, Due 3/1/2028 (euro-denominated)	0.77 %	897	—
1.375% 12-Year Senior Notes, Due 9/12/2028 (euro-denominated)	1.46 %	673	688
1.95% 12-Year Senior Notes, Due 7/24/2029 (euro-denominated)	2.08 %	785	802
2.60% 10-Year Senior Notes, Due 10/1/2029	2.74 %	900	—
0.875% 12-Year Senior Notes, Due 10/1/2031 (euro-denominated)	1.13 %	1,009	—
2.875% 20-Year Senior Notes, Due 7/24/2037 (euro-denominated)	2.94 %	785	802
1.50% 20-Year Senior Notes, Due 10/1/2039 (euro-denominated)	1.73 %	1,009	—
5.30% 30-Year Senior Notes, Due 2/1/2044	5.37 %	400	400
4.10% 30-Year Senior Notes, Due 8/15/2047	4.23 %	750	750
1.875% 30-Year Senior Notes, Due 10/1/2049 (euro-denominated)	1.98 %	1,121	—
Other		16	21
Total Borrowings at Par Value		17,960	19,186
Fair Value Hedge Accounting Adjustments		(13)	(93)
Unamortized Discount, Net		(94)	(21)
Unamortized Debt Issuance Costs		(101)	(82)
Total Borrowings at Carrying Value		17,752	18,990
Less: Short-term Obligations and Current Maturities		676	1,271
Long-term Obligations		\$ 17,076	\$ 17,719

The effective interest rates for the fixed-rate debt include the stated interest on the notes, the accretion of any discount or amortization of any premium, the amortization of any debt issuance costs and, if applicable, adjustments related to hedging.

See Note 14 for fair value information pertaining to the company's long-term obligations.

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

As of December 31, 2019, the annual repayment requirements for debt obligations are as follows:

(In millions)	
2020	\$ 676
2021	4
2022	564
2023	1,001
2024	2,122
2025 and Thereafter	13,593
	\$ 17,960

As of December 31, 2018, short-term obligations and current maturities of long-term obligations in the accompanying balance sheet included \$693 million of commercial paper, short-term bank borrowings and borrowings under lines of credit of certain of the company's subsidiaries. The weighted average interest rate for short-term borrowings was 0.74% at December 31, 2018. No such borrowings were outstanding at December 31, 2019. In addition to available borrowings under the company's revolving credit agreements, discussed below, the company had unused lines of credit of \$62 million as of December 31, 2019. These unused lines of credit generally provide for short-term unsecured borrowings at various interest rates.

Credit Facilities

The company has a revolving credit facility with a bank group that provides for up to \$2.50 billion of unsecured multi-currency revolving credit. The facility expires in July 2021. The agreement calls for interest at either a LIBOR-based rate, a EURIBOR-based rate (for funds drawn in euro) or a rate based on the prime lending rate of the agent bank, at the company's option. The agreement contains affirmative, negative and financial covenants, and events of default customary for facilities of this type. The covenants in our revolving credit facility (the Facility) include a Consolidated Leverage Ratio (total debt-to-Consolidated EBITDA) and a Consolidated Interest Coverage Ratio (Consolidated EBITDA to Consolidated Interest Expense), as such terms are defined in the Facility. Specifically, the company has agreed that, so long as any lender has any commitment under the Facility, any letter of credit is outstanding under the Facility, or any loan or other obligation is outstanding under the Facility, it will maintain a maximum Consolidated Leverage Ratio of 3.5:1.0. The company has also agreed that so long as any lender has any commitment under the Facility or any letter of credit is outstanding under the Facility, or any loan or other obligation is outstanding under the Facility, it will maintain a minimum Consolidated Interest Coverage Ratio of 3.0:1.0 as of the last day of any fiscal quarter. As of December 31, 2019, no borrowings were outstanding under the Facility, although available capacity was reduced by approximately \$72 million as a result of outstanding letters of credit.

Commercial Paper Programs

The company has commercial paper programs pursuant to which it may issue and sell unsecured, short-term promissory notes (CP Notes). Under the U.S. program, a) maturities may not exceed 397 days from the date of issue and b) the CP Notes are issued on a private placement basis under customary terms in the commercial paper market and are not redeemable prior to maturity nor subject to voluntary prepayment. Under the euro program, maturities may not exceed 183 days and may be denominated in euro, U.S. dollars, Japanese yen, British pounds sterling, Swiss franc, Canadian dollars or other currencies. Under both programs, the CP Notes are issued at a discount from par (or premium to par, in the case of negative interest rates), or, alternatively, are sold at par and bear varying interest rates on a fixed or floating basis. As of December 31, 2019, there were no outstanding borrowings under these programs.

Senior Notes

Interest on the floating rate senior notes is payable quarterly. Interest is payable annually on the other euro-denominated senior notes and semi-annually on all other senior notes. Each of the notes may be redeemed at a redemption price of 100% of the principal amount plus a specified make-whole premium and accrued interest. The company is subject to certain affirmative and negative covenants under the indentures governing the senior notes, the most restrictive of which limits the ability of the company to pledge principal properties as security under borrowing arrangements.

In 2019, the company refinanced certain of its debt by issuing new senior notes and using the proceeds to redeem some of its existing senior notes. In connection with these redemptions, the company incurred \$184 million of losses on the early extinguishment of debt included in Other Expense, Net on the accompanying statement of income. Upon redemption of the senior notes, the company terminated the related fixed to floating rate interest rate swap arrangements and paid \$17 million, included in other financing activities, net, in the accompanying statement of cash flows. The company also terminated related

THERMO FISHER SCIENTIFIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

cross-currency interest rate swap arrangements and received \$44 million, included in other investing activities, net, in the accompanying statement of cash flows.

In 2018, Thermo Fisher Scientific (Finance I) B.V., a wholly-owned finance subsidiary of the company, issued the Floating Rate Senior Notes due 2020 included in the table above. This subsidiary has no independent function other than financing activities. The Floating Rate Senior Notes due 2020 are fully and unconditionally guaranteed by the company and no other subsidiaries of the company have guaranteed the obligations.

Interest Rate Swap Arrangements

The company has entered into LIBOR-based interest rate swap arrangements with various banks. The aggregate amounts of the swaps are equal to the principal amount of the notes and the payment dates of the swaps coincide with the interest payment dates of the note. The swap contracts provide for the company to pay a variable interest rate and receive a fixed rate. The variable interest rates reset monthly. The swaps have been accounted for as fair value hedges of the notes. See Note 14 for additional information on the interest rate swap arrangements and related cross-currency interest rate swap arrangements. The following table summarizes the outstanding interest rate swap arrangements on the company's senior notes at December 31, 2019:

(Dollars in millions)	Aggregate Notional Amount	Pay Rate	Pay Rate as of December 31, 2019	Receive Rate
3.00% Senior Notes due 2023 (a)	\$ 1,000	1-month LIBOR + 1.7640%	3.5038 %	3.00 %

(a) The payments on \$900 million notional value of these interest rate swaps are offset in part by cross-currency interest rate swaps which effectively reduced the pay rate as of December 31, 2019 from a weighted average of 3.50% to a weighted average of 1.14%.

The company entered into \$900 million notional value of cross-currency interest rate swaps, which effectively convert a portion of the semi-annual payments related to the variable rate, U.S. dollar denominated, LIBOR-based interest rate swaps to payments on variable rate, euro denominated, EURIBOR-based cross-currency interest rate swaps.

Note 11. Leases

As a lessee, the company leases certain logistics, office, and manufacturing facilities, as well as vehicles, copiers, and other equipment. These operating leases generally have remaining lease terms between 1 month and 30 years, and some include options to extend (generally for 1 to 10 years) or have options to terminate the arrangement within 1 year. The company's finance leases are not material.

The company has guaranteed the residual value of three leased operating facilities with lease terms ending in 2020, 2023 and 2024. The company has agreed with the lessor to comply with certain financial covenants consistent with its other debt arrangements (Note 10). The aggregate maximum guarantee under these three lease arrangements is \$147 million. Operating lease ROU assets and lease liabilities for these lease arrangements are recorded on the consolidated balance sheet as of December 31, 2019, but exclude any amounts for residual value guarantees.

As a lessee, the consolidated statement of income includes pre-tax operating lease costs of \$208 million and pre-tax variable lease costs of \$41 million for the year ended December 31, 2019. Lease costs arising from finance leases, short-term leases, and sublease income are not material.

Cash used in operating activities for payments of amounts included in the measurement of operating lease liabilities was \$208 million in the year ended December 31, 2019. Operating lease ROU assets of \$205 million were obtained in exchange for new operating lease liabilities in the year ended December 31, 2019.

The weighted-average remaining operating lease term was 6.2 years and the weighted average discount rate was 4.0% as of December 31, 2019.

ROU assets of \$699 million as of December 31, 2019, are classified in other assets in the consolidated balance sheet. Operating lease liabilities of \$167 million and \$571 million as of December 31, 2019, are classified in other accrued expenses and other long-term liabilities, respectively, in the consolidated balance sheet.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

As of December 31, 2019, future payments of operating lease liabilities are as follows:

(In millions)	
2020	\$ 197
2021	158
2022	124
2023	92
2024	68
2025 and Thereafter	197
Total Lease Payments	836
Less: Imputed Interest	98
Total Operating Lease Liability	\$ 738

As a lessor, operating leases, sales-type leases and direct financing leases are not material.

As previously disclosed in the company's 2018 Annual Report on Form 10-K and under previous lease accounting guidance, income from continuing operations includes expense from operating leases of \$211 million and \$198 million in 2018 and 2017, respectively, and the following is a summary of annual future minimum lease and rental commitments under noncancelable operating leases as of December 31, 2018:

(In millions)	
2019	\$ 192
2020	158
2021	118
2022	86
2023	58
2024 and Thereafter	177
	\$ 789

Note 12. Commitments and Contingencies

Purchase Obligations

The company has entered into unconditional purchase obligations, in the ordinary course of business, that include agreements to purchase goods, services or fixed assets and to pay royalties that are enforceable and legally binding and that specify all significant terms including: fixed or minimum quantities to be purchased; fixed, minimum or variable price provisions; and the approximate timing of the transaction. Purchase obligations exclude agreements that are cancelable at any time without penalty. The aggregate amount of the company's unconditional purchase obligations totaled \$1.20 billion at December 31, 2019 and the majority of these obligations are expected to be settled during 2020.

Letters of Credit, Guarantees and Other Commitments

Outstanding letters of credit and bank guarantees totaled \$272 million at December 31, 2019. Substantially all of these letters of credit and guarantees expire before 2026.

Outstanding surety bonds and other guarantees totaled \$61 million at December 31, 2019. The expiration of these bonds and guarantees ranges through 2022.

The letters of credit, bank guarantees and surety bonds principally secure performance obligations, and allow the holder to draw funds up to the face amount of the letter of credit, bank guarantee or surety bond if the applicable business unit does not perform as contractually required.

The company is a guarantor of pension plan obligations of a divested business. The purchaser of the divested business has agreed to pay for the pension benefits, however the company was required to guarantee payment of these pension benefits should the purchaser fail to do so. The amount of the guarantee at December 31, 2019 was \$41 million.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

In connection with the sale of businesses of the company, the buyers have assumed certain contractual obligations of such businesses and have agreed to indemnify the company with respect to those assumed liabilities. In the event a third-party to a transferred contract does not recognize the transfer of obligations or a buyer defaults on its obligations under the transferred contract, the company could be liable to the third-party for such obligations. However, in such event, the company would be entitled to seek indemnification from the buyer.

Indemnifications

In conjunction with certain transactions, primarily divestitures, the company has agreed to indemnify the other parties with respect to certain liabilities related to the businesses that were sold or leased properties that were abandoned (e.g., retention of certain environmental, tax, employee and product liabilities). The scope and duration of such indemnity obligations vary from transaction to transaction. Where probable, an obligation for such indemnifications is recorded as a liability. Generally, a maximum obligation cannot be reasonably estimated. Other than obligations recorded as liabilities at the time of divestiture, historically the company has not made significant payments for these indemnifications.

In connection with the company's efforts to reduce the number of facilities that it occupies, the company has vacated some of its leased facilities or sublet them to third parties. When the company sublets a facility to a third-party, it remains the primary obligor under the master lease agreement with the owner of the facility. As a result, if a third-party vacates the sublet facility, the company would be obligated to make lease or other payments under the master lease agreement. The company believes that the financial risk of default by sublessors is individually and in the aggregate not material to the company's financial position or results of operations.

In connection with the sale of products in the ordinary course of business, the company often makes representations affirming, among other things, that its products do not infringe on the intellectual property rights of others and agrees to indemnify customers against third-party claims for such infringement. The company has not been required to make material payments under such provisions.

Environmental Matters

The company is currently involved in various stages of investigation and remediation related to environmental matters. The company cannot predict all potential costs related to environmental remediation matters and the possible impact on future operations given the uncertainties regarding the extent of the required cleanup, the complexity and interpretation of applicable laws and regulations, the varying costs of alternative cleanup methods and the extent of the company's responsibility. Expenses for environmental remediation matters related to the costs of installing, operating and maintaining groundwater-treatment systems and other remedial activities related to historical environmental contamination at the company's domestic and international facilities were not material in any period presented. The company records accruals for environmental remediation liabilities, based on current interpretations of environmental laws and regulations, when it is probable that a liability has been incurred and the amount of such liability can be reasonably estimated. The company calculates estimates based upon several factors, including input from environmental specialists and management's knowledge of and experience with these environmental matters. The company includes in these estimates potential costs for investigation, remediation and operation and maintenance of cleanup sites. At December 31, 2019, the company's total environmental liability was approximately \$66 million. While management believes the accruals for environmental remediation are adequate based on current estimates of remediation costs, the company may be subject to additional remedial or compliance costs due to future events such as changes in existing laws and regulations, changes in agency direction or enforcement policies, developments in remediation technologies or changes in the conduct of the company's operations, which could have a material adverse effect on the company's financial position, results of operations or cash flows.

Litigation and Related Contingencies

There are various lawsuits and claims pending against the company including matters involving product liability, intellectual property, employment and commercial issues. The company determines the probability and range of possible loss based on the current status of each of these matters. A liability is recorded in the financial statements if it is believed to be probable that a loss has been incurred and the amount of the loss can be reasonably estimated. The company establishes a liability that is an estimate of amounts expected to be paid in the future for events that have already occurred. The company accrues the most likely amount or at least the minimum of the range of probable loss when a range of probable loss can be estimated. The accrued liabilities are based on management's judgment as to the probability of losses for asserted and unasserted claims and, where applicable, actuarially determined estimates. Accrual estimates are adjusted as additional information becomes known or payments are made. The amount of ultimate loss may differ from these estimates. Due to the inherent uncertainties associated with pending litigation or claims, the company cannot predict the outcome, nor, with respect to certain pending litigation or claims where no liability has been accrued, make a meaningful estimate of the reasonably possible

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loss or range of loss that could result from an unfavorable outcome. The company has no material accruals for pending litigation or claims for which accrual amounts are not disclosed below, nor are material losses deemed probable for such matters. It is reasonably possible, however, that an unfavorable outcome that exceeds the company's current accrual estimate, if any, for one or more of the matters described below could have a material adverse effect on the company's results of operations, financial position and cash flows.

Product Liability, Workers Compensation and Other Personal Injury Matters

The range of probable loss for product liability, workers compensation and other personal injury matters of the company's continuing operations at December 31, 2019, was approximately \$206 million to \$342 million on an undiscounted basis. The portion of these liabilities assumed in the 2006 merger with Fisher was recorded at its fair (present) value at the date of merger. The company's accrual for all such matters in total, including the discounted liabilities, was \$198 million at December 31, 2019 (or \$215 million undiscounted). The accrual includes estimated defense costs and is gross of estimated amounts due from insurers of \$84 million at December 31, 2019 (or \$96 million undiscounted) that are included in other assets in the accompanying balance sheet. The portion of these insurance assets assumed in the merger with Fisher was also recorded at its fair value at the date of merger. In addition to the above accrual, as of December 31, 2019, the company had a product liability accrual of \$9 million (undiscounted) relating to divested businesses.

The assets and liabilities assumed at the Fisher merger date were ascribed a fair value based on the present value of expected future cash flows, using a discount rate equivalent to the risk free rate of interest for monetary assets with comparable maturities (weighted average discount rate of 4.67%). The discount on the liabilities of approximately \$17 million and the discount on the assets of approximately \$12 million (net discount \$5 million) are being accreted to interest expense over the expected settlement period.

Although the company believes that the amounts accrued and estimated recoveries are probable and appropriate based on available information, including actuarial studies of loss estimates, the process of estimating losses and insurance recoveries involves a considerable degree of judgment by management and the ultimate amounts could vary materially. Insurance contracts do not relieve the company of its primary obligation with respect to any losses incurred. The collectability of amounts due from its insurers is subject to the solvency and willingness of the insurer to pay, as well as the legal sufficiency of the insurance claims. Management monitors the payment history as well as the financial condition and ratings of its insurers on an ongoing basis.

Intellectual Property Matters

On June 3, 2013, Unisone Strategic IP filed a complaint against Life Technologies, a subsidiary of the company, in the United States District Court for the Southern District of California alleging patent infringement by Life Technologies' supply chain management system software, which operates with product "supply centers" installed at customer sites. Plaintiff seeks damages for alleged willful infringement, attorneys' fees, costs, and injunctive relief. On August 24, 2017, Unisone filed an appeal from a decision by the Patent Trial and Appeal Board (PTAB) that found the challenged patent claims invalid. The United States Court of Appeals for the Federal Circuit upheld the PTAB's ruling finding the challenged claims in the Unisone patent invalid. Unisone had until March 11, 2019 to file an appeal with the United States Supreme Court. Unisone did not appeal that decision, and consequently the case before the United States District Court, which had been stayed pending the outcome of the PTAB decision, resumed with Unisone filing an amended complaint on September 12, 2019 regarding similar patent claims that were not included in the PTAB proceeding. On November 1, 2019, Life Technologies filed two additional covered business method (CBM) challenges with the PTAB regarding Unisone's new patent claims. On December 16, 2019, the United States District Court granted Life Technologies' motion to stay the case pending the PTAB's decision whether to institute a CBM review of the new patent claims.

Note 13. Comprehensive Income and Shareholders' Equity

Comprehensive Income (Loss)

Comprehensive income combines net income and other comprehensive items. Other comprehensive items represent certain amounts that are reported as components of shareholders' equity in the accompanying balance sheet.

In the fourth quarter of 2017, the company recorded an out of period adjustment to correct an error in the accounting for income taxes associated with the partial hedge of its net investment in a foreign operation in 2014 through the third quarter of 2017. The adjustment affected deferred income taxes and other comprehensive income and, in the aggregate, increased comprehensive income by \$101 million for the year ended December 31, 2017. The adjustment does not have any impact on the

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

company's statements of income or cash flows. The company determined that the adjustment was not material to the consolidated financial statements for any previously reported annual or interim periods.

Changes in each component of accumulated other comprehensive items, net of tax are as follows:

(In millions)	Currency Translation Adjustment	Unrealized Losses on Hedging Instruments	Pension and Other Postretirement Benefit Liability Adjustment	Total
Balance at December 31, 2018	\$ (2,243)	\$ (52)	\$ (203)	\$ (2,498)
Other comprehensive items before reclassifications	(107)	(38)	(93)	(238)
Amounts reclassified from accumulated other comprehensive items	30	19	8	57
Net other comprehensive items	(77)	(19)	(85)	(181)
Balance at December 31, 2019	<u>\$ (2,320)</u>	<u>\$ (71)</u>	<u>\$ (288)</u>	<u>\$ (2,679)</u>

Shareholders' Equity

At December 31, 2019, the company had reserved 25 million unissued shares of its common stock for possible issuance under stock-based compensation plans.

Note 14. Fair Value Measurements and Fair Value of Financial Instruments

Fair Value Measurements

The company uses the market approach technique to value its financial instruments and there were no changes in valuation techniques during 2019. The company's financial assets and liabilities carried at fair value are primarily comprised of insurance contracts, investments in derivative contracts, mutual funds holding publicly traded securities and other investments in unit trusts held as assets to satisfy outstanding deferred compensation and retirement liabilities; and acquisition-related contingent consideration.

The fair value accounting guidance requires that assets and liabilities carried at fair value be classified and disclosed in one of the following three categories:

Level 1: Quoted market prices in active markets for identical assets or liabilities that the company has the ability to access.

Level 2: Observable market based inputs or unobservable inputs that are corroborated by market data such as quoted prices, interest rates and yield curves.

Level 3: Inputs are unobservable data points that are not corroborated by market data.

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The following tables present information about the company's financial assets and liabilities measured at fair value on a recurring basis as of December 31, 2019 and December 31, 2018:

(In millions)	December 31, 2019	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets				
Cash equivalents	\$ 1,280	\$ 1,280	\$ —	\$ —
Investments in common stock, mutual funds and other similar instruments	19	19	—	—
Warrants	6	—	6	—
Insurance contracts	131	—	131	—
Derivative contracts	37	—	37	—
Total Assets	\$ 1,473	\$ 1,299	\$ 174	\$ —
Liabilities				
Derivative contracts	\$ 24	\$ —	\$ 24	\$ —
Contingent consideration	55	—	—	55
Total Liabilities	\$ 79	\$ —	\$ 24	\$ 55

(In millions)	December 31, 2018	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets				
Cash equivalents	\$ 769	\$ 769	\$ —	\$ —
Bank time deposits	2	2	—	—
Investments in mutual funds and other similar instruments	10	10	—	—
Warrants	8	—	8	—
Insurance contracts	113	—	113	—
Derivative contracts	31	—	31	—
Total Assets	\$ 933	\$ 781	\$ 152	\$ —
Liabilities				
Derivative contracts	\$ 145	\$ —	\$ 145	\$ —
Contingent consideration	37	—	—	37
Total Liabilities	\$ 182	\$ —	\$ 145	\$ 37

The company uses the Black-Scholes model to value its warrants. The company determines the fair value of its insurance contracts by obtaining the cash surrender value of the contracts from the issuer. The fair value of derivative contracts is the estimated amount that the company would receive/pay upon liquidation of the contracts, taking into account the change in interest rates and currency exchange rates. The company determines the fair value of acquisition-related contingent consideration based on the probability-weighted discounted cash flows associated with such future payments. Changes to the fair value of contingent consideration are recorded in selling, general and administrative expense. The following table provides a rollforward of the fair value, as determined by level 3 inputs, of the contingent consideration.

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

(In millions)	2019	2018
Contingent Consideration		
Beginning Balance	\$ 37	\$ 35
Acquisitions (including assumed balances)	24	11
Payments	(3)	(8)
Change in fair value included in earnings	(3)	(1)
Ending Balance	<u>\$ 55</u>	<u>\$ 37</u>

Derivative Contracts

The following table provides the aggregate notional value of outstanding derivative contracts.

(In millions)	December 31, 2019	December 31, 2018
Notional Amount		
Interest rate swaps (described in Note 10)	\$ 1,000	\$ 3,100
Cross-currency interest rate swaps - designated as net investment hedges	900	1,500
Currency exchange contracts	2,846	3,424

While certain derivatives are subject to netting arrangements with counterparties, the company does not offset derivative assets and liabilities within the consolidated balance sheet. The following tables present the fair value of derivative instruments in the consolidated balance sheet and statement of income.

(In millions)	Fair Value – Assets		Fair Value – Liabilities	
	December 31, 2019	December 31, 2018	December 31, 2019	December 31, 2018
Derivatives Designated as Hedging Instruments				
Interest rate swaps (a)	\$ —	\$ —	\$ 13	\$ 129
Cross-currency interest rate swaps (b)	33	28	—	—
Derivatives Not Designated as Hedging Instruments				
Currency exchange contracts (c)	4	3	11	16
Total Derivatives	<u>\$ 37</u>	<u>\$ 31</u>	<u>\$ 24</u>	<u>\$ 145</u>

(a) The fair value of the interest rate swaps is included in the consolidated balance sheet under the caption other long-term liabilities.

(b) The fair value of the cross-currency interest rate swaps is included in the consolidated balance sheet under the caption other assets.

(c) The fair value of the currency exchange contracts is included in the consolidated balance sheet under the captions other current assets or other accrued expenses.

The following amounts related to cumulative basis adjustments for fair value hedges were included in the consolidated balance sheet under the caption long-term obligations:

(In millions)	Carrying Amount of the Hedged Liability		Cumulative Amount of Fair Value Hedging Adjustment - Increase (Decrease) Included in Carrying Amount of Liability (d)	
	December 31, 2019	December 31, 2018	December 31, 2019	December 31, 2018
Long-term Obligations	\$ 980	\$ 3,291	\$ (13)	\$ (93)

(d) Includes increase in the carrying amount of \$30 million at December 31, 2018 on discontinued hedging relationships.

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

(In millions)	Gain (Loss) Recognized	
	2019	2018
Fair Value Hedging Relationships		
Interest rate swaps		
Hedged long-term obligations - included in other expense, net	\$ (93)	\$ 7
Derivatives designated as hedging instruments - included in other expense, net	97	(5)
Derivatives Designated as Cash Flow Hedges		
Interest rate swaps		
Included in unrealized losses on hedging instruments within other comprehensive items	(50)	—
Amount reclassified from accumulated other comprehensive items to other expense, net	(25)	(12)
Financial Instruments Designated as Net Investment Hedges		
Foreign currency-denominated debt		
Included in currency translation adjustment within other comprehensive items	60	336
Cross-currency interest rate swaps		
Included in currency translation adjustment within other comprehensive items	49	28
Included in other expense, net	48	21
Derivatives Not Designated as Hedging Instruments		
Currency exchange contracts		
Included in cost of product revenues	1	2
Included in other expense, net	52	37

Gains and losses recognized on currency exchange contracts and the interest rate swaps designated as fair value hedges are included in the consolidated statement of income together with the corresponding, offsetting losses and gains on the underlying hedged transactions.

The company also uses foreign currency-denominated debt and cross-currency interest rate swaps to partially hedge its net investments in foreign operations against adverse movements in exchange rates. The majority of the company's euro-denominated senior notes and cross-currency interest rate swaps have been designated as, and are effective as, economic hedges of part of the net investment in a foreign operation. Accordingly, foreign currency transaction gains or losses due to spot rate fluctuations on the euro-denominated debt instruments and contract fair value changes on the cross-currency interest rate swaps, excluding interest accruals, are included in currency translation adjustment within other comprehensive items and shareholders' equity.

See Note 1 and Note 10 for additional information on the company's risk management objectives and strategies.

Cash Flow Hedge Arrangements

In 2019, the company entered into interest rate swap arrangements to mitigate the risk of interest rates rising prior to the completion of debt offerings. Based on the company's conclusion that the debt offerings were probable, the swaps hedged the cash flow risk for each of the interest payments on €1.80 billion plus \$900 million aggregate principal amounts of the planned fixed-rate debt issues. The hedges were terminated in 2019, in connection with the debt offerings. The aggregate fair value of the hedges at that time, \$38 million, net of tax, has been classified as a reduction to accumulated other comprehensive items and will be amortized to interest expense over the terms of the related debt issuances. The company had a cash outlay of \$50 million in 2019 associated with termination of the arrangements, included in other financing activities, net, in the accompanying statement of cash flows.

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Fair Value of Other Financial Instruments

The carrying value and fair value of the company's notes receivable and debt obligations are as follows:

(In millions)	December 31, 2019		December 31, 2018	
	Carrying Value	Fair Value	Carrying Value	Fair Value
Debt Obligations:				
Senior notes	\$ 17,736	\$ 18,650	\$ 18,276	\$ 18,322
Commercial paper	—	—	693	693
Other	16	16	21	21
	<u>\$ 17,752</u>	<u>\$ 18,666</u>	<u>\$ 18,990</u>	<u>\$ 19,036</u>

The fair value of debt obligations was determined based on quoted market prices and on borrowing rates available to the company at the respective period ends which represent level 2 measurements.

Note 15. Supplemental Cash Flow Information

(In millions)	2019	2018	2017
Cash Paid For:			
Interest	\$ 790	\$ 687	\$ 533
Income Taxes	896	591	479
Non-cash Investing and Financing Activities			
Declared but unpaid dividends	77	69	61
Issuance of stock upon vesting of restricted stock units	182	170	125

Cash, cash equivalents and restricted cash is included in the consolidated balance sheet as follows:

(In millions)	December 31, 2019	December 31, 2018
Cash and Cash Equivalents	\$ 2,399	\$ 2,103
Restricted Cash Included in Other Current Assets	21	12
Restricted Cash Included in Other Assets	2	2
Cash, Cash Equivalents and Restricted Cash	<u>\$ 2,422</u>	<u>\$ 2,117</u>

Amounts included in restricted cash represent funds held as collateral for bank guarantees and incoming cash in China awaiting government administrative clearance.

Note 16. Restructuring and Other Costs (Income), Net

Restructuring and other costs (income), net, in 2019 primarily included the gain on the sale of the company's Anatomical Pathology business, and, to a lesser extent, transaction/integration costs related to acquisitions and a divestiture; sales of inventory revalued at the date of acquisition; and continuing charges for headcount reductions and facility consolidations in an effort to streamline operations, including the closure and consolidation of operations within several facilities in the U.S. and Europe. In 2019, severance actions associated with facility consolidations and cost reduction measures affected approximately 1% of the company's workforce.

Restructuring and other costs in 2018 included continuing charges for headcount reductions and facility consolidations in an effort to streamline operations, including the closure and consolidation of operations within several facilities in the U.S. and Europe; third-party transaction/integration costs primarily related to recent acquisitions; sales of inventories revalued at the date of acquisition; and environmental remediation charges. These charges were partially offset by gains on sales of real estate and favorable results of litigation. In 2018, severance actions associated with facility consolidations and cost reduction measures affected approximately 1% of the company's workforce.

THERMO FISHER SCIENTIFIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Restructuring and other costs in 2017 included continuing charges for headcount reductions and facility consolidations in an effort to streamline operations, including the closure and consolidation of operations within several facilities in the U.S., Europe and Asia; costs to achieve synergies related to acquisitions, including severance and abandoned facility costs; third-party acquisition transaction and integration costs primarily associated with the acquisitions of FEI and Patheon; sales of inventories revalued at the date of acquisition; charges to conform the accounting policies of Patheon to the company's accounting policies; charges for changes in estimates of acquisition contingent consideration; hurricane response/impairment costs; net charges for the settlement/curtailment of retirement plans; and net credits for litigation matters. In 2017, severance actions associated with facility consolidations and cost reduction measures affected less than 2% of the company's workforce.

As of February 26, 2020, the company has identified restructuring actions that will result in additional charges of approximately \$65 million, primarily in 2020, and expects to identify additional actions during 2020 which will be recorded when specified criteria are met, such as communication of benefit arrangements or when the costs have been incurred.

2019

During 2019, the company recorded net restructuring and other costs by segment as follows:

(In millions)	Cost of Revenues	Selling, General and Administrative Expenses	Restructuring and Other Costs (Income), Net	Total
Life Sciences Solutions	\$ 16	\$ —	\$ 24	\$ 40
Analytical Instruments	—	24	14	38
Specialty Diagnostics	—	4	(471)	(467)
Laboratory Products and Services	1	35	17	53
Corporate	—	(1)	3	2
	<u>\$ 17</u>	<u>\$ 62</u>	<u>\$ (413)</u>	<u>\$ (334)</u>

The principal components of net restructuring and other costs by segment are as follows:

Life Sciences Solutions

In 2019, the Life Sciences Solutions segment recorded \$40 million of net restructuring and other charges, including \$16 million of charges to cost of revenues for the sales of inventory revalued at the date of acquisition. The segment also recorded \$24 million of net restructuring and other charges for severance and other costs associated with facility consolidations in the U.S and Europe, the impairment of acquired technology in development, and pre-acquisition litigation-related matters.

Analytical Instruments

In 2019, the Analytical Instruments segment recorded \$38 million of net restructuring and other charges, including \$24 million of charges to selling, general, and administrative expense, principally third-party transaction costs related to the acquisition of Gatan, subsequently terminated. The segment also recorded \$14 million of restructuring and other costs, primarily for employee severance and other costs associated with facility consolidations in the U.S. and Europe.

Specialty Diagnostics

In 2019, the Specialty Diagnostics segment recorded \$467 million of net restructuring and other income, primarily a gain on the divestiture of its Anatomical Pathology business (see Note 2). The segment also recorded \$4 million of charges to selling, general, and administrative expense, principally third-party transaction costs in connection with the sale of the Anatomical Pathology business.

Laboratory Products and Services

In 2019, the Laboratory Products and Services segment recorded \$53 million of net restructuring and other charges. The segment recorded charges to cost of revenues of \$1 million to conform the accounting policies of recently acquired businesses with the company's accounting policies and \$35 million of charges to selling, general, and administrative expenses, principally third-party transaction/integration costs for recently completed acquisitions. The segment also recorded \$17 million of restructuring and other costs, primarily charges for severance at businesses streamlining operations and employee compensation due at Brammer Bio on the date of acquisition.

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Corporate

In 2019, the company recorded \$2 million of net restructuring and other costs principally for severance at its corporate operations, partially offset by income from favorable results of product liability litigation.

2018

During 2018, the company recorded net restructuring and other costs by segment as follows:

(In millions)	Cost of Revenues	Selling, General and Administrative Expenses	Restructuring and Other Costs, Net	Total
Life Sciences Solutions	\$ 4	\$ 12	\$ (17)	\$ (1)
Analytical Instruments	3	8	28	39
Specialty Diagnostics	—	3	(1)	2
Laboratory Products and Services	5	16	31	52
Corporate	—	(10)	9	(1)
	<u>\$ 12</u>	<u>\$ 29</u>	<u>\$ 50</u>	<u>\$ 91</u>

The principal components of net restructuring and other costs by segment are as follows:

Life Sciences Solutions

In 2018, the Life Sciences Solutions segment recorded \$1 million of net restructuring and other income. The segment recorded charges to cost of revenues of \$4 million for the sales of inventory revalued at the date of acquisition, as well as \$12 million of charges to selling, general, and administrative expenses, primarily third-party transaction/integration costs related to recent acquisitions. The segment also recorded \$17 million of net restructuring and other income, principally for a \$46 million net gain on the resolution of litigation, partially offset by charges for severance other costs associated with facility consolidations in the U.S.

Analytical Instruments

In 2018, the Analytical Instruments segment recorded \$39 million of net restructuring and other charges. The segment recorded net charges to cost of revenues of \$3 million for the sales of inventory revalued at the date of acquisition; \$8 million of net charges to selling, general, and administrative expense, principally third-party transaction costs related to the acquisition of Gatan; and \$28 million of restructuring and other costs, primarily for employee severance and other costs associated with facility consolidations in the U.S. and Europe, as well as abandoned facilities costs associated with the remediation and closure of a manufacturing facility in the U.S.

Specialty Diagnostics

In 2018, the Specialty Diagnostics segment recorded \$2 million of net restructuring and other charges, including \$3 million of net charges to selling, general, and administrative expense, principally third-party transaction costs in connection with the planned sale of the Anatomical Pathology business. The segment also recorded \$1 million of net restructuring and other income, including a \$6 million gain on the sale of real estate, mostly offset by cash charges for severance and other costs associated with facility consolidations in the U.S. and Europe.

Laboratory Products and Services

In 2018, the Laboratory Products and Services segment recorded \$52 million of net restructuring and other charges. The segment recorded charges to cost of revenues of \$5 million, principally for the sales of inventory revalued at the date of acquisition, and \$16 million of charges to selling, general, and administrative expenses for third-party transaction/integration costs related to the acquisition of Patheon. The segment also recorded \$31 million of restructuring and other costs, primarily charges for environmental remediation associated with a Superfund site in the U.S., employee severance, and, to a lesser extent, hurricane response costs.

Corporate

In 2018, the company recorded \$1 million of net restructuring and other income, principally income from favorable results of product liability litigation, mostly offset by charges for environmental remediation at an abandoned facility and, to a lesser extent, severance at its corporate operations.

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

2017

During 2017, the company recorded net restructuring and other costs by segment as follows:

(In millions)	Cost of Revenues	Selling, General and Administrative Expenses	Restructuring and Other Costs, Net	Total
Life Sciences Solutions	\$ 1	\$ 29	\$ (16)	\$ 14
Analytical Instruments	31	(2)	30	59
Specialty Diagnostics	1	(2)	39	38
Laboratory Products and Services	90	61	41	192
Corporate	—	(8)	3	(5)
	<u>\$ 123</u>	<u>\$ 78</u>	<u>\$ 97</u>	<u>\$ 298</u>

The principal components of net restructuring and other costs by segment are as follows:

Life Sciences Solutions

In 2017, the Life Sciences Solutions segment recorded \$14 million of net restructuring and other charges. The segment recorded \$29 million of charges to selling, general and administrative expenses, principally for changes in estimates of acquisition contingent consideration. The segment also recorded \$16 million of restructuring and other income, net, including \$64 million of net credits principally for pre-acquisition litigation-related matters, and, to a lesser extent, net gains on the settlement of retirement plans. These credits were largely offset by \$48 million of cash restructuring costs, including \$23 million of severance and related costs primarily to achieve acquisition synergies, and \$25 million of abandoned facilities costs primarily for the consolidation of facilities in the U.S.

Analytical Instruments

In 2017, the Analytical Instruments segment recorded \$59 million of net restructuring and other charges. The segment recorded charges to cost of revenues of \$31 million for the sales of inventory revalued at the date of acquisition, as well as \$30 million of restructuring and other costs, primarily for severance and other costs to achieve acquisition synergies, as well as charges for the settlement of retirement plans.

Specialty Diagnostics

In 2017, the Specialty Diagnostics segment recorded \$38 million of net restructuring and other charges, principally charges for litigation-related matters, and, to a lesser extent, cash costs for employee severance and other costs associated with headcount reductions in the U.S. and Europe.

Laboratory Products and Services

In 2017, the Laboratory Products and Services segment recorded \$192 million of net restructuring and other charges. The segment recorded charges to cost of revenues of \$90 million, including \$33 million to conform the accounting policies of Patheon to the company's accounting policies and \$55 million for sales of inventory revalued at the date of acquisition. The segment also recorded \$61 million of charges to selling, general, and administrative expenses, including \$55 million for third-party acquisition transaction costs, as well as \$6 million to conform the accounting policies of Patheon to the company's accounting policies. The segment also recorded \$41 million of restructuring and other costs, primarily for employee severance and compensation due at Patheon on the date of acquisition, and, to a lesser extent, hurricane response/impairment charges.

Corporate

In 2017, the company recorded \$5 million of net restructuring and other income, principally \$8 million of income from favorable results of product liability litigation, partially offset by charges for the settlement of a retirement plan and severance at its corporate operations.

THERMO FISHER SCIENTIFIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The following table summarizes the cash components of the company's restructuring plans. The non-cash components and other amounts reported as restructuring and other costs, net, in the accompanying statement of income have been summarized in the notes to the tables. Accrued restructuring costs are included in other accrued expenses in the accompanying balance sheet.

(In millions)	Severance	Abandonment of Excess Facilities	Other (a)	Total
Balance at December 31, 2016	\$ 38	\$ 32	\$ 2	\$ 72
Costs incurred in 2017 (c)	62	27	17	106
Reserves reversed (b)	(9)	—	—	(9)
Payments	(62)	(19)	(12)	(93)
Currency translation	1	—	(1)	—
Balance at December 31, 2017	30	40	6	76
Costs incurred in 2018 (d)	51	33	18	102
Reserves reversed (b)	(7)	(4)	(3)	(14)
Payments	(39)	(27)	(17)	(83)
Currency translation	(1)	—	—	(1)
Balance at December 31, 2018	34	42	4	80
Cumulative effect of accounting change (f)	—	(28)	—	(28)
Costs incurred in 2019 (e)	45	7	14	66
Reserves reversed (b)	(13)	(1)	—	(14)
Payments	(47)	(10)	(12)	(69)
Currency translation	(1)	—	—	(1)
Balance at December 31, 2019	<u>\$ 18</u>	<u>\$ 10</u>	<u>\$ 6</u>	<u>\$ 34</u>

- (a) Other includes relocation and moving expenses associated with facility consolidations, as well as employee retention costs which are accrued ratably over the period through which employees must work to qualify for a payment.
- (b) Represents reductions in cost of plans.
- (c) Excludes \$27 million of net credits associated with litigation-related matters, and \$27 million of other restructuring charges, net, primarily for hurricane response/impairment, charges associated with the settlement/curtailment of retirement plans, and non-cash compensation due at an acquired business.
- (d) Excludes \$38 million of income, net, primarily associated with litigation-related matters, gains on sales of real estate, charges for environmental remediation, and hurricane response costs.
- (e) Excludes \$482 million of net gain on the sale of businesses, and \$17 million of other restructuring charges, net, primarily for the impairment of acquired in-process research and development, pre-acquisition litigation-related matters, and compensation due to employees on the date of acquisition.
- (f) Impact of adopting new lease accounting guidance on January 1, 2019.

The company expects to pay accrued restructuring costs primarily through 2020.

THERMO FISHER SCIENTIFIC INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Note 17. Unaudited Quarterly Information

(In millions except per share amounts)	2019			
	First (a)	Second (b)	Third (c)	Fourth (d)
Revenues	\$ 6,125	\$ 6,316	\$ 6,272	\$ 6,829
Gross Profit	2,707	2,823	2,763	3,035
Net Income	815	1,119	760	1,002
Earnings per Share:				
Basic	2.04	2.80	1.89	2.51
Diluted	2.02	2.77	1.88	2.49

Amounts reflect aggregate restructuring and other items, net, as follows:

- (a) Costs of \$28 million.
- (b) Income of \$443 million.
- (c) Costs of \$43 million.
- (d) Costs of \$38 million.

(In millions except per share amounts)	2018			
	First (a)	Second (b)	Third (c)	Fourth (d)
Revenues	\$ 5,853	\$ 6,078	\$ 5,920	\$ 6,507
Gross Profit	2,580	2,738	2,615	2,924
Net Income	579	752	709	898
Earnings per Share:				
Basic	1.44	1.87	1.76	2.23
Diluted	1.43	1.85	1.75	2.22

Amounts reflect aggregate restructuring and other items, net, as follows:

- (a) Costs of \$56 million.
- (b) Costs of \$25 million.
- (c) Income of \$32 million.
- (d) Costs of \$42 million.

Description of Registrant's Securities

The following description of registered securities of Thermo Fisher Scientific Inc. is intended as a summary only and therefore is not a complete description. As used in this "Description of Registrant's Securities," the terms "Thermo Fisher," "Company," "we," "our" and "us" refer to Thermo Fisher Scientific Inc. and do not, unless the context otherwise indicates, include our subsidiaries.

Our authorized capital stock consists of 1.2 billion shares of common stock, \$1.00 par value per share, and 50,000 shares of preferred stock, \$100 par value per share. Our common stock is registered under Section 12(b) of the Exchange Act. We also have several classes of debt securities registered under Section 12(b) of the Exchange Act.

COMMON STOCK

This description of our common stock is based upon, and qualified by reference to, our Third Amended and Restated Certificate of Incorporation, as amended (our "*certificate of incorporation*"), our amended and restated by-laws (our "*bylaws*") and applicable provisions of Delaware corporate law (the "*DGCL*"). You should read our certificate of incorporation and bylaws, which are incorporated by reference as Exhibits 3.1 to 3.3 and Exhibit 3.4, respectively, to the Annual Report on Form 10-K, of which this Exhibit 4.16 is a part, for the provisions that are important to you.

General

Annual Meeting. Annual meetings of our stockholders are held on the date designated in accordance with our bylaws. Written notice must be mailed to each stockholder entitled to vote not less than ten nor more than 60 days before the date of the meeting. The presence in person or by proxy of the holders of record of a majority of our issued and outstanding shares entitled to vote at such meeting constitutes a quorum for the transaction of business at meetings of the stockholders, unless or except to the extent that the presence of a larger number may be required by our certificate of incorporation or the DGCL. Special meetings of the stockholders may only be called by the board of directors, the chairman of the board of directors or the chief executive officer. Except as may be otherwise provided by applicable law, our certificate of incorporation or our bylaws, all matters shall be decided by a majority of the votes cast by stockholders entitled to vote thereon at a duly held meeting of stockholders at which a quorum is present. Except as may be otherwise provided by our certificate of incorporation, a nominee shall be elected to the board of directors if the votes cast for such nominee's election exceed the votes cast against, provided that if, on the tenth business day before we mail our notice of meeting to the stockholders, the number of nominees exceeds the number of directors to be elected, the election shall be decided by a plurality.

Voting Rights. Each holder of common stock is entitled to one vote for each share held on all matters to be voted upon by stockholders.

Dividends. The holders of common stock, after any preferences of holders of any preferred stock, are entitled to receive dividends when and if declared by the board of directors out of legally available funds.

Liquidation and Dissolution. If we are liquidated or dissolved, the holders of the common stock will be entitled to share in our assets available for distribution to stockholders in proportion to the amount of common stock they own. The amount available for common stockholders is calculated after payment of liabilities. Holders of any preferred stock will receive a preferential share of our assets before the holders of the common stock receive any assets.

Other Rights. Holders of the common stock have no right to:

- convert the stock into any other security;
- have the stock redeemed; or
- purchase additional stock or to maintain their proportionate ownership interest.

The common stock does not have cumulative voting rights. Holders of shares of the common stock are not required to make additional capital contributions. There is no sinking fund provision with respect to our common stock.

Provisions of Our Certificate of Incorporation and Bylaws and Delaware Law That May Have Anti-Takeover Effects

Removal of Directors by Stockholders. Our bylaws provide that, except as otherwise provided by our certificate of incorporation or the DGCL, any one or more or all of the members of our board of directors may be removed, with or without cause, by the holders of a majority of the voting power of the shares entitled to vote thereon.

Stockholder Nomination of Directors and Proposals. Our bylaws provide that a stockholder must notify us in writing of any stockholder nomination of a director or proposal for other business not less than 60 days and not more than 75 days prior to the first anniversary of the date on which we first mailed our proxy materials for the preceding year's annual meeting; *provided*, that if the date of the annual meeting is advanced or delayed by more than 30 days from such anniversary date, notice by the stockholder to be timely must be so delivered not later than the close of business on the later of (x) the 90th day prior to the date of such meeting or (y) the 10th day following the day on which public announcement of the date of such annual meeting is first made by us.

Proxy Access. Our bylaws provide for proxy access, which permits a stockholder, or a group of up to 20 stockholders, owning 3% or more of our outstanding common stock continuously for at least three years, to nominate and include in our proxy materials qualifying director nominees constituting up to the greater of (i) 20% of the board of directors or (ii) two directors. To be timely, any proxy access notice must be delivered in writing to our secretary not less than 120 days and not more than 150 days prior to the first anniversary of the preceding year's annual meeting; *provided* that in the event that the date of the annual meeting is advanced by more than 30 days or delayed (other than as a result of adjournment) by more than 60 days from the first anniversary of the preceding year's annual meeting, or if no annual meeting was held in the preceding year, a stockholder's notice must be received no earlier than 150 days prior to such annual meeting and not later than the close of business on the later of (a) the 120th day prior to such annual meeting and (b) the 10th day following the day on which notice of the date of such annual meeting was mailed or publicly announced. The complete proxy access provisions for director nominations are set forth in our bylaws.

"Blank Check" Preferred Stock. Our board of directors is authorized, without further action by our stockholders, to issue up to fifty thousand (50,000) shares of "blank check" preferred stock of the par value of \$100 per share in one or more series possessing such specific terms, including dividend rates, conversion prices, voting rights, redemption prices, maturity dates and other special rights, preferences, qualifications, limitations, and restrictions thereof, as shall be determined in the resolution or resolutions providing for the issue of such Preferred Stock adopted by our Board of Directors. The issuance of preferred stock could impede the completion of a merger, tender offer or other takeover attempt.

Delaware Business Combination Statute. Section 203 of the DGCL, is applicable to us. Section 203 of the DGCL restricts some types of transactions and business combinations between a corporation and a 15% stockholder. A 15% stockholder is generally considered by Section 203 to be a person owning 15% or more of the corporation's outstanding voting stock. Section 203 refers to a 15% stockholder as an "interested stockholder." Section 203 restricts these transactions for a period of three years from the date the stockholder acquires 15% or more of our outstanding voting stock. With some exceptions, unless the transaction is approved by the board of directors and the holders of at least two-thirds of the outstanding voting stock of the corporation, Section 203 prohibits significant business transactions such as:

- a merger with, disposition of significant assets to or receipt of disproportionate financial benefits by the interested stockholder, and
- any other transaction that would increase the interested stockholder's proportionate ownership of any class or series of our capital stock.

The shares held by the interested stockholder are not counted as outstanding when calculating the two-thirds of the outstanding voting stock needed for approval.

The prohibition against these transactions does not apply if:

- prior to the time that any stockholder became an interested stockholder, the board of directors approved either the business combination or the transaction in which such stockholder acquired 15% or more of our outstanding voting stock, or
- the interested stockholder owns at least 85% of our outstanding voting stock as a result of a transaction in which such stockholder acquired 15% or more of our outstanding voting stock. Shares held by persons who are both directors and officers or by some types of employee stock plans are not counted as outstanding when making this calculation.

DEBT SECURITIES

This description of our registered debt securities is based upon, and qualified by reference to the 2009 Base Indenture, Eighth Supplemental Indenture, Ninth Supplemental Indenture, Thirteenth Supplemental Indenture, Fifteenth Supplemental Indenture, Sixteenth Supplemental Indenture, Eighteenth Supplemental Indenture, 2016 Base Indenture and Second Supplemental Indenture (each as hereinafter defined). You should read the 2009 Base Indenture, Eighth Supplemental Indenture, Ninth Supplemental Indenture, Thirteenth Supplemental Indenture, Fifteenth Supplemental Indenture, Sixteenth Supplemental Indenture, Eighteenth Supplemental Indenture, 2016 Base Indenture and Second Supplemental Indenture, which are incorporated by reference as exhibits 4.1, 4.3, 4.4, 4.7, 4.9, 4.10, 4.12, 4.14 and 4.15, respectively, to the Annual Report on Form 10-K of which this Exhibit 4.16 is a part, for the provisions that are important to you.

As used in this description of registered debt securities, the term “*Issuer*” refers to Thermo Fisher Scientific (Finance I) B.V. (“*Thermo Fisher International*”) in the case of the Floating Rate Notes and to Thermo Fisher in the case of the 2022 Notes, 2024 Notes, March 2025 Notes, April 2025 Notes, 2026 Notes, 2027 Notes, March 2028 Notes, September 2028 Notes, 2029 Notes, 2031 Notes, 2037 Notes, 2039 Notes and 2049 Notes (collectively, the “*Fixed Rate Notes*”) (each as hereinafter defined), and the term “*indenture*” means the applicable indenture for the particular series of notes being described. The term “*notes*” means the Fixed Rate Notes and Floating Rate Notes.

General

We currently have the following series of senior notes issued and outstanding under an Indenture (the “*2016 Base Indenture*”), dated as of August 9, 2016, among Thermo Fisher International, as issuer, Thermo Fisher, as guarantor, and The Bank of New York Mellon Trust Company, N.A. (the “*Trustee*”), as trustee, as supplemented by the Second Supplemental Indenture (the “*Second Supplemental Indenture*”), dated as of August 8, 2018, by and among Thermo Fisher International, as issuer, Thermo Fisher, as guarantor, and the Trustee, as trustee: Floating Rate Senior Notes due 2020 (the “*Floating Rate Notes*”).

We currently have the following series of senior notes issued and outstanding under an Indenture (the “*2009 Base Indenture*”), dated as of November 20, 2009, by and between Thermo Fisher, as issuer, and the Trustee, as trustee, as supplemented by the Eighth Supplemental Indenture (the “*Eighth Supplemental Indenture*”), dated as of November 24, 2014, by and among Thermo Fisher, as issuer, the Trustee, as trustee, and The Bank of New York Mellon, London Branch (“*BNY London Branch*”), as London paying agent: 2.000% Senior Notes due 2025 (the “*April 2025 Notes*”).

We currently have the following series of senior notes issued and outstanding under the 2009 Base Indenture, as supplemented by the Ninth Supplemental Indenture (the “*Ninth Supplemental Indenture*”), dated as of July 21, 2015, by and among Thermo Fisher, as issuer, the Trustee, as trustee, and BNY London Branch, as London paying agent: 2.150% Senior Notes due 2022 (the “*2022 Notes*”).

We currently have the following series of senior notes issued and outstanding under the 2009 Base Indenture, as supplemented by the Thirteenth Supplemental Indenture (the “*Thirteenth Supplemental Indenture*”), dated as of September 12, 2016, by and between Thermo Fisher, as issuer, and the Trustee, as trustee: 0.750% Senior Notes due 2024 (the “*2024 Notes*”) and 1.375% Senior Notes due 2028 (the “*September 2028 Notes*”).

We currently have the following series of senior notes issued and outstanding under the 2009 Base Indenture, as supplemented by the Fifteenth Supplemental Indenture (the “*Fifteenth Supplemental Indenture*”), dated as of March 16, 2017, by and between Thermo Fisher, as issuer, and the Trustee, as trustee: 1.450% Senior Notes due 2027 (the “*2027 Notes*”).

We currently have the following series of senior notes issued and outstanding under the 2009 Base Indenture, as supplemented by the Sixteenth Supplemental Indenture (the “*Sixteenth Supplemental Indenture*”), dated as of July 24, 2017, by and between Thermo Fisher, as issuer, and the Trustee, as trustee: 1.400% Senior Notes due 2026 (the “*2026 Notes*”), 1.950% Senior Notes due 2029 (the “*2029 Notes*”) and 2.875% Senior Notes due 2037 (the “*2037 Notes*”).

We currently have the following series of senior notes issued and outstanding under the 2009 Base Indenture, as supplemented by the Eighteenth Supplemental Indenture (the “*Eighteenth Supplemental Indenture*”), dated as of September 30, 2019, by and between Thermo Fisher, as issuer, and the Trustee, as trustee: 0.125% Senior Notes due 2025 (the “*March 2025 Notes*”), 0.500% Senior Notes due 2028 (the “*March 2028 Notes*”), 0.875% Senior Notes due 2031 (the “*2031 Notes*”), 1.500% Senior Notes due 2039 (the “*2039 Notes*”), and 1.875% Senior Notes due 2049 (the “*2049 Notes*”).

Each series of notes are general unsecured obligations of the Issuer, and the Floating Rate Notes are fully and unconditionally guaranteed by Thermo Fisher. Each series of notes and guarantees rank equally in right of payment with existing and any future unsecured indebtedness of Thermo Fisher (and Thermo Fisher International in the case of the Floating Rate Notes), and are junior in right of payment to the Issuer’s senior indebtedness (including senior debt securities). Each series of notes and the related guarantees are also effectively subordinated to any existing and future secured indebtedness of Thermo Fisher (and Thermo Fisher International in the case of the Floating Rate Notes) to the extent of the assets securing such indebtedness, and will be structurally subordinated to all existing and any future indebtedness and any other liabilities of their respective subsidiaries (except, with respect Thermo Fisher International, as Issuer of the Floating Rate Notes). Each series of notes and the related guarantees are senior in right of payment to any of our existing and future indebtedness that is subordinated to such notes or guarantees.

Aside from the restrictions set forth under “Certain Covenants” below, neither the notes nor the indentures restrict our ability or the ability of our subsidiaries, including Thermo Fisher International, to incur additional debt, repurchase securities, recapitalize, or pay dividends or make distributions to shareholders, or require us, or Thermo Fisher International, to maintain interest coverage or other current ratios. We may from time to time, without notice to or the consent of the holders of any series of notes, create and issue further notes of any such series ranking equally with the notes of such series and having the same terms as such series (or the same terms other than (1) the payment of interest accruing prior to the issue date of such further notes or (2) the first payment of interest following the issue date of such further notes). Such further notes may be consolidated and form a single series with the notes of such series and have the same terms as to status, redemption or otherwise as the notes of such series.

Maturity

Each series of notes will mature and bear interest as provided in the following table:

<i>Series</i>	<i>Maturity</i>	<i>Interest Rate</i>	<i>Interest Payment Dates</i>	<i>Record Dates</i>	<i>Aggregate Principal Amount Issued/ Authorized/ Outstanding</i>
Floating Rate Notes	August 7, 2020	Three-month EURIBOR plus 0.300% per annum, provided that the minimum interest rate shall be zero	Quarterly in arrears on February 7, May 7, August 7 and November 7 of each year, commencing on November 7, 2018	Fifteenth calendar day prior to the applicable interest payment date	€ 600,000,000
2022 Notes	July 21, 2022	2.150%	Annually in arrears on July 21 of each year, commencing on July 21, 2016	July 6	€ 500,000,000
2024 Notes	September 12, 2024	0.750%	Annually in arrears on September 12, commencing on September 12, 2017	August 28	€ 1,000,000,000

<i>Series</i>	<i>Maturity</i>	<i>Interest Rate</i>	<i>Interest Payment Dates</i>	<i>Record Dates</i>	<i>Aggregate Principal Amount Issued/ Authorized/ Outstanding</i>
March 2025 Notes	March 1, 2025	0.125%	Annually in arrears on March 1, commencing on March 1, 2020	Fifteenth calendar day prior to the applicable interest payment date	€ 800,000,000
April 2025 Notes	April 15, 2025	2.000%	Annually in arrears on April 15 of each year, commencing on April 15, 2015	April 1	€ 640,000,000
2026 Notes	January 23, 2026	1.400%	Annually in arrears on January 23 of each year, commencing on January 23, 2018	January 8	€ 700,000,000
2027 Notes	March 16, 2027	1.450%	Annually in arrears on March 16 of each year, commencing on March 16, 2018	March 1	€ 500,000,000
March 2028 Notes	March 1, 2028	0.500%	Annually in arrears on March 1, commencing on March 1, 2020	Fifteenth calendar day prior to the applicable interest payment date	€ 800,000,000
September 2028 Notes	September 12, 2028	1.375%	Annually in arrears on September 12, commencing on September 12, 2017	August 28	€ 600,000,000
2029 Notes	July 24, 2029	1.950%	Annually in arrears on July 24, commencing on July 24, 2018	July 9	€ 700,000,000
2031 Notes	October 1, 2031	0.875%	Annually in arrears on October 1, commencing on October 1, 2020	Fifteenth calendar day prior to the applicable interest payment date	€ 900,000,000
2037 Notes	July 24, 2037	2.875%	Annually in arrears on July 24, commencing on July 24, 2018	July 9	€ 700,000,000
2039 Notes	October 1, 2039	1.500%	Annually in arrears on October 1, commencing on October 1, 2020	Fifteenth calendar day prior to the applicable interest payment date	€ 900,000,000
2049 Notes	October 1, 2049	1.875%	Annually in arrears on October 1, commencing on October 1, 2020	Fifteenth calendar day prior to the applicable interest payment date	€ 1,000,000,000

The notes are not subject to any sinking fund.

Interest

Floating Rate Notes

The Floating Rate Notes bear interest at a rate equivalent to the 3-month EURIBOR (as defined below) (the “*Base rate*”) plus 0.300% per annum; *provided, however*, that the minimum interest rate shall be zero. The Floating Rate Notes bear interest from August 8, 2018 or from the immediately preceding interest payment date to which interest has been paid. Interest on the Floating Rate Notes is payable quarterly in arrears on February 7, May 7, August 7 and November 7, commencing on November 7, 2018; *provided*, that, if any such interest payment date is a day that is not a business day, such interest payment date will be the next succeeding day that is a business day (and no additional interest will accrue or otherwise accumulate on the amount payable for the period from and after such interest payment date); except that if such next succeeding business day falls in the next succeeding calendar month, such interest payment date is the immediately preceding business day. The interest rate on the Floating Rate Notes resets quarterly on February 7, May 7, August 7 and November 7, commencing on November 7, 2018 (each, an “*interest reset date*”); *provided*, that, if any interest reset date is a day that is not a business day, such interest reset date is the next succeeding day that is a business day, except that if such next succeeding business day falls in the next succeeding calendar month, such interest reset date is the immediately preceding business day. The interest rate on the Floating Rate Notes is determined on the second Target2 (as defined below) business day preceding the interest reset date (a “*EURIBOR Interest Determination Date*”). Interest on an interest payment date will be paid to the persons, or “holders,” in whose names the Floating Rate Notes are registered on the security register at the close of business on the regular record date. The regular record date is the fifteenth calendar day, whether or not a business day, immediately preceding the related interest payment date. Interest on the Floating Rate Notes is computed on the basis of a 360-day year and the actual number of days in the period for which interest is being calculated.

The base rate is equal to the interest rate for deposits in euro designated as “EURIBOR” and sponsored jointly by the European Banking Federation and ACI—the Financial Market Association (or any company established by the joint sponsors for purposes of compiling and publishing that rate) on each EURIBOR Interest Determination Date, and is determined in accordance with the following provisions:

- EURIBOR is the offered rate for deposits in euro having a maturity of three months, as that rate appears on Reuters Page EURIBOR01 as of 11:00 A.M., Brussels time, on the relevant EURIBOR Interest Determination Date.
- If the rate described above does not appear on Reuters Page EURIBOR01, EURIBOR will be determined on the basis of the rates, at approximately 11:00 A.M., Brussels time, on the relevant EURIBOR Interest Determination Date, at which deposits of the following kind are offered to prime banks in the Euro-Zone interbank market by the principal Euro-Zone office of each of four major banks in that market selected by Thermo Fisher International: euro deposits having a maturity of three months and in a principal amount of not less than €1,000,000 that is representative for a single transaction in such market at such time. Thermo Fisher International will request the principal Euro-Zone office of each of these banks to provide to the paying agent and the calculation agent a quotation in writing of its rate. If at least two quotations are provided in writing, EURIBOR for such EURIBOR Interest Determination Date will be the arithmetic mean (rounded upwards) calculated by Thermo Fisher International of such quotations.
- If fewer than two quotations are provided as described above, EURIBOR for the relevant EURIBOR Interest Determination Date will be the arithmetic mean of the rates for loans of the following kind to leading Euro-Zone banks quoted in writing, at approximately 11:00 A.M., Brussels time, on such EURIBOR Interest Determination Date, by three major banks in the Euro-Zone selected by Thermo Fisher International: loans of euro having a maturity of three months and in a principal amount of not less than €1,000,000 that is representative for a single transaction in such market at such time.
- If fewer than three banks selected by Thermo Fisher International are quoting as described above, EURIBOR shall be the EURIBOR in effect on such EURIBOR Interest Determination Date (or, in the case of the first interest reset date, EURIBOR will be the initial base rate).

If any maturity date or earlier date of redemption falls on a day that is not a business day, the required payment shall be made on the next business day as if it were made on the date the payment was due and no interest shall accrue on the amount so payable for the period from and after that maturity date or that date of redemption, as the case may be.

Fixed Rate Notes

The Fixed Rate Notes bear interest, which is paid annually in arrears, at the rates and from the respective dates set forth in the table above.

Interest on an interest payment date is paid to the persons, or “holders” in whose names the Fixed Rate Notes are registered in the security register on the immediately preceding record date noted in the table above, whether or not a business day, as the case may be (each such date being a “*regular record date*”). Interest on the Fixed Rate Notes will be computed on the basis of an ACTUAL/ACTUAL (ICMA) (as defined in the rulebook of the International Capital Markets Association) day count convention.

If any interest payment date, maturity date or earlier date of redemption falls on a day that is not a business day, the required payment on the Fixed Rate Notes shall be made on the next business day as if it were made on the date the payment was due and no interest shall accrue on the amount so payable for the period from and after that interest payment date, that maturity date or that date of redemption, as the case may be, until the next business day.

For purposes of the Fixed Rate Notes and Floating Rate Notes, “business day” means any day, other than a Saturday or Sunday, (1) which is not a day on which banking institutions in The City of New York or London are authorized or required by law, regulation or executive order to close and (2) on which the Trans-European Automated Real-Time Gross Settlement Express Transfer system (the TARGET2 system), or any successor thereto, is open.

Guarantees

Thermo Fisher has fully and unconditionally guaranteed the due and punctual payment of all obligations of Thermo Fisher International with respect to the Floating Rate Notes, for the payment of principal of, premium, if any, or interest or any additional amounts, on the Floating Rate Notes or otherwise, when and as the same shall become due and payable, whether at maturity, upon redemption or otherwise. The guarantee is an unsecured and unsubordinated obligation of Thermo Fisher and ranks equally with all of its other unsecured and unsubordinated obligations.

Optional Redemption

Floating Rate Notes

On and after July 7, 2020 (one month prior to their maturity), Thermo Fisher International will have the option to redeem the Floating Rate Notes, in whole at any time or in part from time to time, at a redemption price equal to 100% of the principal amount of the Floating Rate Notes to be redeemed, plus accrued and unpaid interest thereon, if any, to, but excluding, the redemption date.

Notwithstanding the foregoing, installments of interest on the notes that are due and payable on an interest payment date falling on or prior to a redemption date will be payable on the interest payment date to the registered holders as of the close of business on the relevant record date in accordance with the Floating Rate Notes and the indenture.

If less than all of the Floating Rate Notes are to be redeemed, the notes to be redeemed shall be selected by the Trustee, in accordance with applicable depositary procedures, unless otherwise required by law or applicable stock exchange requirements. Floating Rate Notes may be redeemed in part in the minimum authorized denomination for notes or in any integral multiple of such amount. Unless we default in payment of the redemption price, on and after the redemption date, interest will cease to accrue on the notes or portions thereof called for redemption.

Fixed Rate Notes

We have the option to redeem the Fixed Rate Notes of any series, in whole at any time or in part from time to time, on at least 15 days but no more than 60 days prior written notice transmitted to the registered holders of the notes to be redeemed. With respect to the March 2025 Notes, March 2028 Notes, 2031 Notes, 2039 Notes and 2049 Notes,

any notice may, at our discretion, be subject to the satisfaction or waiver of one or more conditions precedent. In such case, the notice shall state the nature of such condition precedent.

Prior to the applicable Par Call Date, upon redemption of the notes of any series, we will pay a redemption price equal to the greater of:

- 1) 100% of the principal amount of the Fixed Rate Notes to be redeemed, and
- 2) the sum of the present values of the Remaining Scheduled Payments (as defined below) of the Fixed Rate Notes to be redeemed, discounted to the date of redemption on an annual basis (ACTUAL/ACTUAL (ICMA)) using a discount rate equal to the Comparable Bond Rate (as defined below) plus 19 basis points in the case of the April 2025 Notes, 20 basis points in the case of the 2024 Notes, March 2025 Notes, 2026 Notes, 2027 Notes and March 2028 Notes, 25 basis points in the case of the 2022 Notes, September 2028 Notes, 2029 Notes and 2031 Notes, 30 basis points in the case of the 2037 Notes and 2039 Notes, and 35 basis points in the case of the 2049 Notes,

plus, in each case, accrued and unpaid interest thereon, if any, to, but excluding, the redemption date.

On and after the applicable Par Call Date, upon redemption of the Fixed Rate Notes of any series, we will pay a redemption price equal to 100% of the principal amount of the notes to be redeemed, plus, in each case, accrued and unpaid interest thereon, if any, to, but excluding, the redemption date.

Notwithstanding the foregoing, installments of interest on the Fixed Rate Notes that are due and payable on an interest payment date falling on or prior to a redemption date will be payable on the interest payment date to the registered holders as of the close of business on the relevant record date in accordance with the notes and the indenture.

If less than all of the March 2025 Notes, March 2028 Notes, 2031 Notes, 2039 Notes, or 2049 Notes are to be redeemed, the notes of such series to be redeemed, shall be selected, in the case of global securities, in accordance with applicable depositary procedures and, in the case of definitive securities, in a manner the Trustee deems to be fair and appropriate, unless otherwise required by law or applicable stock exchange requirements. If less than all of the 2022 Notes, 2024 Notes, April 2025, 2026 Notes, 2027 Notes, 2029 Notes, September 2028 Notes or 2037 Notes are to be redeemed, the notes of such series to be redeemed shall be selected by the Trustee, in a manner that it deems fair and appropriate in accordance with applicable depositary procedures, unless otherwise required by law or applicable stock exchange requirements. Notes may be redeemed in part in the minimum authorized denomination for notes or in any integral multiple of such amount. Unless we default in payment of the redemption price, on and after the redemption date, interest will cease to accrue on the notes or portions thereof called for redemption.

“*Comparable Bond Rate*” means, for any redemption date, the rate per annum equal to the annual equivalent yield to maturity or interpolated yield to maturity (on a day count basis), computed as of the third business day immediately preceding that redemption date, of the Comparable Government Issue, assuming a price for the Comparable Government Issue (expressed as a percentage of its principal amount) equal to the Comparable Price for that redemption date.

“*Comparable Government Issue*” means the euro-denominated security issued by the German government selected by an Independent Investment Banker as having an actual or interpolated maturity comparable to the remaining term of the notes to be redeemed (assuming in the case of the 2024 Notes, March 2025 Notes, 2026 Notes, 2027 Notes, March 2028 Notes, September 2028 Notes, 2029 Notes, 2031 Notes, 2037 Notes, 2039 Notes, or 2049 Notes to be redeemed matured on their applicable Par Call Date) that would be utilized, at the time of selection and in accordance with customary financial practice, in pricing new issues of corporate debt securities of comparable maturity to the remaining term of the notes to be redeemed.

“*Comparable Price*” means, with respect to any redemption date, (a) the average of the Reference Dealer Quotations for such redemption date, after excluding the highest and lowest of the Reference Dealer Quotations, (b) if we obtain fewer than four Reference Dealer Quotations, the arithmetic average of those quotations or (c) if we obtain only one Reference Dealer Quotation, such Reference Dealer Quotation.

“*Independent Investment Banker*” means

- (a) with respect to the 2022 Notes, each Reference Dealer appointed by us as Independent Investment Banker (initially, BNP Paribas and HSBC Bank plc);
- (b) with respect to the 2024 Notes and September 2028 Notes, each Reference Dealer appointed by us as Independent Investment Banker (initially, J.P. Morgan Securities plc);
- (c) with respect to March 2025 Notes, March 2028 Notes, 2031 Notes, 2039 Notes, and 2049 Notes, any Reference Dealer appointed by us as Independent Investment Banker (initially, Merrill Lynch International);
- (d) with respect to the April 2025 Notes, each Reference Dealer appointed by us as Independent Investment Banker (initially, HSBC Bank plc, Deutsche Bank AG, London Branch and The Royal Bank of Scotland plc);
- (e) with respect to the 2026 Notes, 2029 Notes and 2037 Notes, each Reference Dealer appointed by us as Independent Investment Banker (initially, Goldman Sachs & Co. LLC); and
- (f) with respect to the 2027 Notes, each Reference Dealer appointed by us as Independent Investment Banker (initially, HSBC Bank plc).

“*Par Call Date*” means April 21, 2022 in the case of the 2022 Notes; June 12, 2024 in the case of the 2024 Notes; January 15, 2025 in the case of the April 2025 Notes; February 1, 2025 in the case of the March 2025 Notes; November 23, 2025 in the case of the 2026 Notes; December 16, 2026 in the case of the 2027 Notes; December 1, 2027 in the case of the March 2028 Notes; June 12, 2028 in the case of the September 2028 Notes; April 24, 2029 in the case of the 2029 Notes; July 1, 2031 in the case of the 2031 Notes; April 24, 2037 in the case of the 2037 Notes; April 1, 2039 in the case of the 2039 Notes; and April 1, 2049, in the case of the 2049 Notes.

“*Reference Dealer*” means

- (a) with respect to the 2022 Notes, each of (i) BNP Paribas and HSBC Bank plc, and their respective affiliates or successors and (ii) three other nationally recognized investment banking firms (or their respective affiliates) that are brokers or dealers of, and/or market makers in, German government bonds (each, for purposes of this clause “a”, a “*Primary Bond Dealer*”) that we select in connection with the particular redemption, and their respective successors, provided that if at any time any of the above is not a Primary Bond Dealer, we will substitute that entity with another nationally recognized investment banking firm that we select that is a Primary Bond Dealer;
- (b) with respect to the 2024 Notes and September 2028 Notes, each of (i) J.P. Morgan Securities plc, Barclays Bank PLC, Mizuho International plc and Morgan Stanley & Co. International plc and their respective affiliates or successors and (ii) one other nationally recognized investment banking firm (or its respective affiliates) that is a broker or dealer of, and/or a market maker in, German government bonds (each, for purposes of this clause “b”, a “*Primary Bond Dealer*”) that we select in connection with the particular redemption, and their respective successors, provided that if at any time any of the above is not a Primary Bond Dealer, we will substitute that entity with another nationally recognized investment banking firm that we select that is a Primary Bond Dealer;
- (c) with respect to the March 2025 Notes, March 2028 Notes, 2031 Notes, 2039 Notes, and 2049 Notes, each of (i) Merrill Lynch International, Goldman Sachs & Co. LLC, Citigroup Global Markets Limited and J.P. Morgan Securities plc and their respective affiliates or successors and (ii) one other nationally recognized investment banking firm (or its affiliate) that is a broker or dealer of, and/or market maker in, German government bonds (each, for purposes of this clause “c”, a “*Primary Bond Dealer*”) that we select in connection with the particular redemption, and its successors, provided that if at any time any of the above is not a Primary Bond Dealer, we will substitute that entity with another nationally recognized investment banking firm that we select that is a Primary Bond Dealer;
- (d) with respect to the April 2025 Notes, each of (i) HSBC Bank plc, Deutsche Bank AG, London Branch and The Royal Bank of Scotland plc, and their respective affiliates or successors and (ii) two other nationally recognized investment banking firms (or their respective affiliates) that are brokers or dealers of, and/or market makers in, German government bonds (each, for purposes of this clause “d”, a “*Primary Bond Dealer*”) that we select in connection with the particular redemption, and their respective successors, provided that if at any time any of the above is not a Primary Bond Dealer, we will substitute that entity with another nationally recognized investment banking firm that we select that is a Primary Bond Dealer;

- (e) With respect to the 2026 Notes, 2029 Notes and 2037 Notes, each of (i) Goldman Sachs & Co. LLC, Merrill Lynch International, Barclays Bank PLC and HSBC Bank plc and their respective affiliates or successors and (ii) one other nationally recognized investment banking firm (or its affiliate) that is a broker or dealer of, and/or a market maker in, German government bonds (each, for purposes of this clause “e”, a “*Primary Bond Dealer*”) that we select in connection with the particular redemption, and its successors, provided that if at any time any of the above is not a Primary Bond Dealer, we will substitute that entity with another nationally recognized investment banking firm that we select that is a Primary Bond Dealer; and
- (f) With respect to the 2027 Notes, each of (i) Credit Suisse Securities (Europe) Limited and HSBC Bank plc and their respective affiliates or successors and (ii) three other nationally recognized investment banking firms (or their respective affiliates) that are brokers or dealers of, and/or market makers in, German government bonds (each, for purposes of this clause “f”, a “*Primary Bond Dealer*”) that we select in connection with the particular redemption, and their respective successors, provided that if at any time any of the above is not a Primary Bond Dealer, we will substitute that entity with another nationally recognized investment banking firm that we select that is a Primary Bond Dealer.

“*Reference Dealer Quotations*” means, with respect to each Reference Dealer and any redemption date, the arithmetic average, as determined by the Independent Investment Banker, of the bid and asked prices for the Comparable Government Issue (expressed, in each case, as a percentage of its principal amount) quoted in writing to the Independent Investment Banker by such Reference Dealer at 11:00 a.m., London time, on the third business day preceding such redemption date.

“*Remaining Scheduled Payments*” means,

- (a) with respect to each 2024 Note, March 2025 Note, 2026 Note, 2027 Note, March 2028 Note, September 2028 Note, 2029 Note, 2031 Note, 2037 Note, 2039 Note, and 2049 Note to be redeemed, the remaining scheduled payments of the principal thereof and interest thereon that would be due after the related redemption date but for such redemption (assuming that such notes to be redeemed matured on their applicable Par Call Date); *provided, however*, that, if such redemption date is not an interest payment date with respect to such note, the amount of the next succeeding scheduled interest payment thereon will be reduced by the amount of interest accrued thereon to such redemption date; and
- (b) with respect to each 2022 Note and April 2025 Note to be redeemed, the remaining scheduled payments of the principal thereof and interest thereon that would be due after the related redemption date for such redemption; *provided, however*, that, if such redemption date is not an interest payment date with respect to such note, the amount of the next succeeding scheduled interest payment thereon will be reduced by the amount of interest accrued thereon to such redemption date.

Redemption Upon Changes in Withholding Taxes

Thermo Fisher International may redeem all, but not less than all, of the Floating Rate Notes under the following conditions:

- if there is an amendment to, or change in, the laws, regulations, rulings or treaties of The Netherlands, the United States or other jurisdiction in which Thermo Fisher International or Thermo Fisher or, in each case, any successor thereof (including a continuing Person formed by a consolidation with Thermo Fisher International or Thermo Fisher, into which Thermo Fisher International or Thermo Fisher is merged, or that acquires or leases all or substantially all of the property and assets of Thermo Fisher International or Thermo Fisher) may be organized, as applicable, or any political subdivision thereof or therein having the power to tax (a “*Taxing Jurisdiction*”), or any change in the application or official interpretation of such laws, regulations, rulings or treaties, including any action taken by, or a change in published administrative practice of, a taxing authority or a holding by a court of competent jurisdiction, regardless of whether such action, change or holding is with respect to Thermo Fisher International or Thermo Fisher;
- as a result of such amendment or change, Thermo Fisher International or Thermo Fisher becomes, or there is a material probability that Thermo Fisher International or Thermo Fisher will become, obligated to pay additional amounts as defined below in “Payment of Additional Amounts,” on the next payment date with respect to the Floating Rate Notes;

- the obligation to pay additional amounts cannot be avoided through Thermo Fisher International's or Thermo Fisher's commercially reasonable measures, not including substitution of the obligor of the Floating Rate Notes;
- Thermo Fisher International delivers to the Trustee:
 - a certificate of Thermo Fisher International or Thermo Fisher, as the case may be, stating that the obligation to pay additional amounts cannot be avoided by Thermo Fisher International or Thermo Fisher as the case may be, taking commercially reasonable measures available to it; and
 - a written opinion of independent tax counsel to Thermo Fisher International or Thermo Fisher, as the case may be, of recognized standing to the effect that Thermo Fisher International or Thermo Fisher, as the case may be, has, or there is a material probability that it will become obligated, to pay additional amounts as a result of a change, amendment, official interpretation or application described above and that Thermo Fisher International or Thermo Fisher, as the case may be, cannot avoid the payment of such additional amounts by taking commercially reasonable measures available to it; and
- following the delivery of the certificate and opinion described in the previous bullet point, Thermo Fisher International provides notice of redemption not less than 30 days, but not more than 60 days, prior to the date of redemption. The notice of redemption cannot be given more than 60 days before the earliest date on which Thermo Fisher International or Thermo Fisher would otherwise be, or there is a material probability that it would otherwise be, required to pay additional amounts.

Upon the occurrence of each of the bullet points above, Thermo Fisher International may redeem the Floating Rate Notes at a redemption price equal to 100% of the principal amount thereof, together with accrued and unpaid interest, if any, to the redemption date.

Redemption Upon Tax Event

We may redeem at our option any series of Fixed Rate Notes in whole, but not in part, on at least 15 days' but not more than 60 days' notice, at a redemption price equal to 100% of their principal amount (plus any accrued interest and additional amounts then payable with respect to the notes to be redeemed), if we determine that (A) as a result of any change or amendment to the laws, treaties, regulations or rulings of the United States or any political subdivision or taxing authority thereof, which change or amendment is announced or becomes effective on or after the date of the applicable prospectus supplement pursuant to which the Fixed Rate Notes of such series were issued, there is a material probability that we have or will become obligated to pay additional amounts as described under "Payment of Additional Amounts" on any notes of such series or (B) on or after the date of the applicable prospectus supplement pursuant to which the Fixed Rate Notes of such series were issued, any change in the official application, enforcement or interpretation of those laws, treaties, regulations or rulings, including a holding by a court of competent jurisdiction in the United States or any other action, taken by any taxing authority or a court of competent jurisdiction in the United States, whether or not such action was taken or made with respect to us, results in a material probability that we have or will become obligated to pay additional amounts as described under "Payment of Additional Amounts" on any notes of such series; *provided* that we determine, in our business judgment, that the obligation to pay such additional amounts cannot be avoided by use of reasonable measures available to us, not including substitution of the obligor under the notes. Prior to the mailing of any notice of such a redemption, we will deliver to the Trustee (1) an officer's certificate stating that we are entitled to effect such a redemption and setting forth a statement of facts showing that the conditions precedent to the right of our company to so redeem have occurred and (2) an opinion of counsel to that effect based on that statement of facts.

Payment of Additional Amounts

Floating Rate Notes

Subject to certain exceptions and limitations, Thermo Fisher International and Thermo Fisher may be required to pay as additional interest ("*additional amounts*") to certain noteholders such amounts as may be necessary so that every net payment on such Floating Rate Note after deduction or withholding for or on account of any present or future tax, assessment or other governmental charge of whatever nature imposed upon or as a result of such payment by the Netherlands or the United States (or any political subdivision or taxing authority thereof or therein), will not be less than the amount provided for in such Floating Rate Note to be then due and payable.

Unless otherwise required by law, neither Thermo Fisher International nor Thermo Fisher will deduct or withhold from payments made by Thermo Fisher International or Thermo Fisher under or with respect to the Floating Rate Notes and the guarantees on account of any present or future taxes, duties, levies, imposts, assessments or governmental charges of whatever nature imposed or levied by or on behalf of any Taxing Jurisdiction (“*Taxes*”). In the event that Thermo Fisher International or Thermo Fisher is required to withhold or deduct any amount for or on account of any Taxes from any payment made under or with respect to a Floating Rate Note or guarantee, as the case may be.

Additional amounts will not be payable with respect to a payment made to a holder of Floating Rate Notes or a holder of beneficial interests in global securities where such holder is subject to taxation on such payment by a relevant Taxing Jurisdiction (as defined above under “Redemption Upon Changes in Withholding Taxes”) for any reason other than such holder’s mere ownership of the debt securities or for or on account of:

- any Taxes that are imposed or withheld solely because such holder (or the beneficial owner for whose benefit such holder holds such debt securities) or a fiduciary, settlor, beneficiary, member, shareholder or other equity owner of, or possessor of a power over, such holder (or beneficial owner) if such holder (or beneficial owner) is an estate, trust, partnership, limited liability company, corporation or other entity:
 - is or was present or engaged in, or is or was treated as present or engaged in, a trade or business in the Taxing Jurisdiction or has or had a permanent establishment in the Taxing Jurisdiction (in each case, other than the mere fact of ownership of such securities, without another presence or business in such Taxing Jurisdiction);
 - has or had any present or former connection (other than the mere fact of ownership of such debt securities) with the Taxing Jurisdiction imposing such Taxes, including being or having been a national citizen or resident thereof, being treated as being or having been a resident thereof or being or having been physically present therein;
 - with respect to any withholding Taxes imposed by the United States, is or was with respect to the United States a personal holding company, a passive foreign investment company, a controlled foreign corporation, a foreign private foundation or other foreign tax exempt organization or corporation that has accumulated earnings to avoid United States federal income tax;
 - actually or constructively owns or owned 10% or more of the total combined voting power of all classes of stock of Thermo Fisher International or Thermo Fisher within the meaning of section 871(h)(3) of the U.S. Internal Revenue Code of 1986, as amended (the “*Code*”); or
 - is or was a bank receiving payments on an extension of credit made pursuant to a loan agreement entered into in the ordinary course of its trade or business within the meaning of section 881(c)(3) of the Code;
- any estate, inheritance, gift, sales, transfer, excise, personal property or similar Taxes imposed with respect to the debt securities, except as otherwise provided in the indenture;
- any Taxes imposed solely as a result of the presentation of such debt securities (where presentation is required) for payment on a date more than 15 days after the date on which such payment became due and payable or the date on which payment thereof is duly provided for, whichever is later, except to the extent that the beneficiary or holder thereof would have been entitled to the payment of additional amounts had the debt securities been presented for payment on any date during such 15-day period;
- any Taxes imposed or withheld solely as a result of the failure of such holder or any other person to comply with applicable certification, information, documentation or other reporting requirements concerning the nationality, residence, identity or connection with the Taxing Jurisdiction of such holder, if such compliance is required by statute, regulation, ruling or administrative practice of the relevant Taxing Jurisdiction or by any applicable tax treaty to which the relevant Taxing Jurisdiction is a party as a precondition to relief or exemption from such Taxes;
- with respect to withholding Taxes imposed by the United States, any such Taxes imposed by reason of the failure of such holder to fulfill the statement requirements of sections 871(h) or 881(c) of the Code;
- any Taxes that are payable by any method other than withholding or deduction by Thermo Fisher International or Thermo Fisher or any paying agent from payments in respect of such debt securities;
- any Taxes required to be withheld by any paying agent from any payment in respect of any debt securities if such payment can be made without such withholding by at least one other paying agent;

- any withholding or deduction for Taxes which would not have been imposed if the relevant debt securities had been presented to another paying agent in a member state of the European Union as of the date of the indenture;
- any withholding or deduction required pursuant to sections 1471 through 1474 of the Code, any regulations or agreements thereunder, official interpretations thereof, any intergovernmental agreement, or any law, rule, guidance or administrative practice implementing an intergovernmental agreement entered into in connection with such sections of the Code; or
- any combination of the above conditions.

Additional amounts also will not be payable to any holder of Floating Rate Notes or the holder of a beneficial interest in a global security that is a fiduciary, partnership, limited liability company or other fiscally transparent entity, or to such holder that is not the sole holder of such Floating Rate Notes or holder of such beneficial interests in such Floating Rate Notes, as the case may be. The exception, however, will apply only to the extent that a beneficiary or settlor with respect to the fiduciary, or a beneficial owner or member of the partnership, limited liability company or other fiscally transparent entity, would not have been entitled to the payment of an additional amount had the beneficiary, settlor, beneficial owner or member received directly its beneficial or distributive share of the payment.

Each of Thermo Fisher International and Thermo Fisher, as applicable, also:

- will make such withholding or deduction of Taxes;
- will remit the full amount of Taxes so deducted or withheld to the relevant Taxing Jurisdiction in accordance with all applicable laws;
- will use its commercially reasonable efforts to obtain from each Taxing Jurisdiction imposing such Taxes certified copies of tax receipts evidencing the payment of any Taxes so deducted or withheld; and
- upon request, will make available to the holders of the notes, within 90 days after the date the payment of any Taxes deducted or withheld is due pursuant to applicable law, certified copies of tax receipts evidencing such payment by Thermo Fisher International or Thermo Fisher or if, notwithstanding Thermo Fisher International's or Thermo Fisher's efforts to obtain such receipts, the same are not obtainable, other evidence of such payments.

At least 30 days prior to each date on which any payment under or with respect to the notes of a series or guarantees is due and payable, if Thermo Fisher International or Thermo Fisher will be obligated to pay additional amounts with respect to such payment, Thermo Fisher International or Thermo Fisher will deliver to the Trustee an officers' certificate stating the fact that such additional amounts will be payable, the amounts so payable and such other information as is necessary to enable the Trustee to pay such additional amounts to holders of such notes on the payment date.

In addition, Thermo Fisher International will pay any stamp, issue, registration, documentary or other similar taxes and duties, including interest, penalties and additional amounts with respect thereto, payable in The Netherlands or the United States or any political subdivision or taxing authority of or in the foregoing in respect of the creation, issue, offering, enforcement, redemption or retirement of the notes.

The foregoing provisions shall survive any termination or the discharge of each indenture and shall apply to any jurisdiction in which Thermo Fisher International or Thermo Fisher or any successor to Thermo Fisher International or Thermo Fisher, as the case may be, is organized or is engaged in business for tax purposes or any political subdivisions or taxing authority or agency thereof or therein.

Fixed Rate Notes

We will pay to a holder of Fixed Rate Notes who is not a United States person (as defined below) additional amounts as may be necessary so that every net payment of the principal of and premium, if any, and interest on such holder's Fixed Rate Notes, after deduction or withholding for or on account of any present or future tax, assessment or other governmental charge imposed upon that holder by the United States or any taxing authority thereof or therein, will not be less than the amount provided in such holder's Fixed Rate Notes to be then due and payable. We will not be required, however, to make any payment of additional amounts for or on account of:

- (a) any tax, assessment or other governmental charge that would not have been imposed but for (1) the existence of any present or former connection (other than a connection arising solely from the ownership of those notes or the receipt of payments in respect of those notes) between that holder (or the beneficial owner for whose benefit such holder holds such notes), or between a fiduciary, settlor, beneficiary of, member or shareholder of, or possessor of a power over, that holder or beneficial owner, if that holder or beneficial owner is an estate, trust, partnership or corporation, and the United States, including that holder or beneficial owner, or that fiduciary, settlor, beneficiary, member, shareholder or possessor, being or having been a citizen or resident or treated as a resident of the United States or being or having been engaged in trade or business or present in the United States or having had a permanent establishment in the United States or (2) the presentation of a note for payment on a date more than 30 days after the later of the date on which that payment becomes due and payable and the date on which payment is duly provided for;
- (b) any estate, inheritance, gift, sales, transfer, excise, personal property, wealth, capital gains, interest equalization or similar tax, assessment or other governmental charge;
- (c) any tax, assessment or other governmental charge imposed on foreign personal holding company income or by reason of a holder (or the beneficial owner for whose benefit such holder holds such notes), or a fiduciary, settlor, beneficiary of, member or shareholder of, or possessor of a power over, the holder or beneficial owner, if that holder or beneficial owner is an estate, trust, partnership or corporation, being or having been a passive foreign investment company, a controlled foreign corporation, a foreign tax exempt organization or a personal holding company with respect to the United States or a corporation that accumulates earnings to avoid U.S. federal income tax;
- (d) any tax, assessment or other governmental charge which is payable otherwise than by withholding from payment of principal of or premium, if any, or interest on such holder's notes;
- (e) any tax, assessment or other governmental charge required to be withheld by any paying agent from any payment of principal of and premium, if any, or interest on any note if that payment can be made without withholding by any other paying agent;
- (f) any tax, assessment or other governmental charge which would not have been imposed but for the failure of a holder (or the beneficial owner for whose benefit such holder holds the notes), or a fiduciary, settlor, beneficiary of, member or shareholder of, or possessor of power over, the holder or beneficial owner, if that holder or beneficial owner is an estate, trust, partnership or corporation, or any intermediary through which a beneficial owner holds notes to comply with our request to comply with certification, information, documentation or other reporting requirements concerning the nationality, residence, identity or connections with the United States of the beneficial owner or any holder of the notes (including, but not limited to, the requirement to provide Internal Revenue Service Forms W-8BEN, Forms W-8BEN-E, Forms W-8ECI, or any subsequent versions thereof or successor thereto, and including, without limitation, any documentation requirement under an applicable income tax treaty);
- (g) any tax, assessment or other governmental charge imposed as a result of a holder (or the beneficial owner for whose benefit such holder holds such notes), or a fiduciary, settlor, beneficiary of, member or shareholder of, or possessor of a power over, the holder or beneficial owner, if that holder or beneficial owner is an estate, trust, partnership or corporation, being or having been (1) a 10% shareholder (as defined in Section 871(h)(3)(B) of the Code, and the regulations that may be promulgated thereunder) of our company or (2) a controlled foreign corporation that is related to us within the meaning of Section 864(d)(4) of the Code, or (3) a bank receiving interest described in Section 881(c)(3)(A) of the Code;
- (h) any tax, assessment or other governmental charge that would not have been imposed but for a change in law, regulation, or administrative or judicial interpretation that becomes effective more than 15 days after the payment becomes due or is duly provided for, whichever occurs later;
- (i) any taxes payable under Sections 1471 through 1474 of the Code (or any amended or successor version of such Sections), any current or future regulations or other guidance thereunder, or any agreement (including any intergovernmental agreement) entered into in connection therewith;
- (j) any combination of items (a), (b), (c), (d), (e), (f), (g), (h), and (i); or
- (k) with respect to the 2022 Notes and April 2025 Notes, any withholding or deduction that is imposed on a payment to an individual and is required to be made pursuant to European Council Directive 2003/48/EC relating to the taxation of savings or any law implementing or complying with, or introduced in order to conform to, such Directive (or any successor version that is substantively comparable) or any combination of items (a), (b), (c), (d), (e), (f), (g), (h), (i) and this item (k);

nor will we pay any additional amounts to any holder that is not the sole beneficial owner of the notes, or a portion of the notes, or that is a fiduciary, partnership or limited liability company to the extent that a beneficial owner with respect to the holder, a beneficiary or settlor with respect to the fiduciary or a member of that partnership, limited liability company or a beneficial owner thereof would not have been entitled to the payment of those additional amounts had that beneficiary, settlor, member or beneficial owner received directly its beneficial or distributive share of the payment.

As used in the preceding paragraph, the term “*United States person*” means any individual who is a citizen or resident of the United States for U.S. federal income tax purposes, a corporation, partnership or other entity created or organized in or under the laws of the United States, any state of the United States or the District of Columbia (other than a partnership that is not treated as a United States person under any applicable Treasury Regulations), or any estate or trust the income of which is subject to United States federal income taxation regardless of its source. As used under this heading “Payment of Additional Amounts” and under the heading “Redemption Upon Tax Event”, the term “*United States*” means the United States of America, the states of the United States, and the District of Columbia.

The notes are subject in all cases to any tax, fiscal or other law or regulation or administrative or judicial interpretation applicable to the senior notes. Except as specifically provided under this heading “Payment of Additional Amounts,” we will not be required to make any payment for any tax, assessment or other governmental charge imposed by any government or a political subdivision or taxing authority of or in any government or political subdivision.

Repurchase Upon a Change of Control

If a Change of Control Triggering Event occurs with respect to any series of notes, unless the Issuer has redeemed such series of notes in full, as described above, has defeased such series of notes or has satisfied and discharged such series of notes as described below, the Issuer will make an offer to each holder of the applicable series of notes (the “*Change of Control Offer*”) to repurchase any and all of such holder’s notes of such series at a repurchase price in cash equal to 101% of the aggregate principal amount of such notes (such principal amount to be equal to €100,000 or an integral multiple of €1,000 in excess thereof), plus accrued and unpaid interest, if any, thereon, to, but excluding, the date of repurchase (the “*Change of Control Payment*”). Within 30 days following any Change of Control Triggering Event, notice shall be delivered to holders of notes of such series describing the transaction or transactions that constitute the Change of Control Triggering Event and offering to repurchase such notes on the date specified in the notice, which date will be no earlier than 15 days and no later than 60 days from the date such notice is delivered (the “*Change of Control Payment Date*”), pursuant to the procedures required by the notes and described in such notice. Notwithstanding the foregoing, installments of interest on any series of notes that are due and payable on interest payment dates falling on or prior to the Change of Control Payment Date will be payable on such interest payment dates to the registered holders as of the close of business on the relevant record dates in accordance with such series of notes and the indenture. The Issuer must comply in all material respects with the requirements of Rule 14e-1 under the Exchange Act, and any other securities laws and regulations thereunder to the extent those laws and regulations are applicable in connection with the repurchase of the notes as a result of a Change of Control Triggering Event. To the extent that the provisions of any such securities laws or regulations conflict with the Change of Control repurchase provisions of the notes, the Issuer will be required to comply with the applicable securities laws and regulations and will not be deemed to have breached its obligations under the Change of Control repurchase provisions of the notes by virtue of such conflicts.

On the Change of Control Payment Date, the Issuer will be required, to the extent lawful, to

- accept for payment all notes or portions of notes of the applicable series properly tendered pursuant to the Change of Control Offer;
- deposit with the Trustee or a paying agent an amount equal to the Change of Control Payment in respect of all notes or portions of notes of the applicable series properly tendered; and
- deliver or cause to be delivered to the Trustee the notes properly accepted, together with an officer’s certificate stating the principal amount of notes or portions of notes of such series being repurchased.

“*Below Investment Grade Rating Event*” means, with respect to a series of notes, such notes are downgraded below Investment Grade Rating by any two of the Rating Agencies on any date during the period (the “*Trigger Period*”) commencing 60 days prior to the first public announcement by Thermo Fisher (or Thermo Fisher International with respect to the Floating Rate Notes) of the occurrence of a Change of Control (or pending Change of Control) and ending 60 days following consummation of such Change of Control (which Trigger Period shall be extended so long as the rating of such notes is under publicly announced consideration for possible downgrade by at least two of such Rating Agencies on such 60th day, such extension to last with respect to each such Rating Agency until the date on which such Rating Agency considering such possible downgrade either (x) rates such notes below Investment Grade or (y) publicly announces that it is no longer considering such notes for possible downgrade, provided that no such extension will occur if on such 60th day such notes are rated Investment Grade by at least two of such Rating Agencies in question and are not subject to review for possible downgrade by such Rating Agencies).

“*Change of Control*” means the occurrence of any of the following:

- (1) the direct or indirect sale, transfer, conveyance or other disposition (other than by way of merger or consolidation), in one or a series of related transactions, of all or substantially all of the properties or assets of Thermo Fisher and its subsidiaries taken as a whole to any “person” (as that term is used in Section 13(d)(3) of the Exchange Act) other than Thermo Fisher or one of its direct or indirect wholly-owned subsidiaries;
- (2) the consummation of any transaction (including, without limitation, any merger or consolidation) as a result of which any “person” (as that term is used in Section 13(d)(3) of the Exchange Act) becomes the “beneficial owner” (as defined in Rules 13d-3 and 13d-5 under the Exchange Act), directly or indirectly, of more than 50% of Thermo Fisher’s outstanding voting stock or other voting stock into which Thermo Fisher’s voting stock is reclassified, consolidated, exchanged or changed, measured by voting power rather than number of shares;
- (3) Thermo Fisher consolidates with, or merges with or into, any “person” or “group” (as that term is used in Section 13(d)(3) of the Exchange Act), or any “person” or “group” consolidates with, or merges with or into, Thermo Fisher, in any such event pursuant to a transaction in which any of Thermo Fisher’s voting stock or the voting stock of such other person is converted into or exchanged for cash, securities or other property, other than any such transaction where the shares of Thermo Fisher’s voting stock outstanding immediately prior to such transaction constitute, or are converted into or exchanged for, a majority of the voting stock of the surviving person or any direct or indirect parent company of the surviving person immediately after giving effect to such transaction;
- (4) with respect to the 2022 Notes and April 2025 Notes, the first day on which a majority of the members of Thermo Fisher’s board of directors are not Continuing Directors; or
- (5) the adoption of a plan relating to Thermo Fisher’s liquidation or dissolution.

Notwithstanding the foregoing, a transaction will not be deemed to involve a Change of Control if (a) Thermo Fisher becomes a direct or indirect wholly-owned subsidiary of a holding company (which shall include a parent company) and (b)(i) the holders of the voting stock of such holding company immediately following that transaction are substantially the same as the holders of Thermo Fisher’s voting stock immediately prior to that transaction or (ii) no “person” (as that term is used in Section 13(d)(3) of the Exchange Act) (other than a holding company satisfying the requirements of this sentence) becomes the “beneficial owner” (as defined in Rules 13d-3 and 13d-5 under the Exchange Act), directly or indirectly, of more than 50% of the voting power of the voting stock of such holding company immediately following such transaction.

For purposes of this definition, “voting stock” means with respect to any specified person (as that term is used in Section 13(d)(3) of the Exchange Act) capital stock of any class or kind the holders of which are ordinarily, in the absence of contingencies, entitled to vote for the election of directors (or persons performing similar functions) of such person, even if the right to vote has been suspended by the happening of such a contingency.

The definition of Change of Control includes a phrase relating to the direct or indirect sale, lease, transfer, conveyance or other disposition of “all or substantially all” of the properties or assets of Thermo Fisher and its subsidiaries taken as a whole. Although there is a limited body of case law interpreting the phrase “substantially all,” there is no precise established definition of the phrase under applicable law. Accordingly, the applicability of the requirement that Thermo Fisher offer to repurchase the notes as a result of a sale, lease, transfer, conveyance or

other disposition of less than all of the assets of Thermo Fisher and its subsidiaries taken as a whole to another person or group may be uncertain.

“*Change of Control Triggering Event*” means, with respect to any series of notes, the occurrence of both a Change of Control and a Below Investment Grade Rating Event.

“*Continuing Directors*” means, as of any date of determination, any member of the board of directors of Thermo Fisher who (1) was a member of the board of directors of Thermo Fisher on the date of the issuance of the April 2025 Notes; or (2) was nominated for election or elected to the board of directors of Thermo Fisher with the approval of a majority of the Continuing Directors who were members of such board of directors of Thermo Fisher at the time of such nomination or election (either by specific vote or by approval of Thermo Fisher’s proxy statement in which such member was named as a nominee for election as a director, without objection to such nomination).

Under a 2009 Delaware Chancery Court interpretation of the foregoing definition of “Continuing Directors,” a board of directors may approve, for purposes of such definition, a slate of shareholder nominated directors without endorsing them, or while simultaneously recommending and endorsing its own slate instead. The foregoing interpretation would permit our board to approve a slate of directors that included a majority of dissident directors nominated pursuant to a proxy contest, and the ultimate election of such dissident slate would not constitute a “Change of Control Triggering Event” that would trigger a right of a holder of April 2025 Notes to require us to repurchase such notes as described above.

“*Fitch*” means Fitch Ratings Limited, and any successor to its rating agency business.

“*Investment Grade Rating*” means a rating by Moody’s equal to or higher than Baa3 (or the equivalent under a successor rating category of Moody’s) or a rating by S&P equal to or higher than BBB- (or the equivalent under any successor rating category of S&P) or a rating by Fitch equal to or higher than BBB- (or the equivalent under any successor rating category of Fitch).

“*Moody’s*” means Moody’s Investors Service, Inc., and any successor to its rating agency business.

“*Rating Agencies*” means (1) Moody’s, S&P and Fitch; and (2) if any of Moody’s, S&P or Fitch ceases to rate the applicable series of notes or fails to make a rating of such notes publicly available for any reason, a “nationally recognized statistical rating organization” within the meaning of Section 3(a)(62) of the Exchange Act, selected by Thermo Fisher (as certified by a resolution of its board of directors) as a replacement agency for any of Moody’s, S&P or Fitch, or all of them, as the case may be.

“*S&P*” means S&P Global Ratings, a division of S&P Global, Inc., and any successor to its rating agency business.

Certain Covenants

Floating Rate Notes

Limitations on Liens. Thermo Fisher will not, and will not permit any of its subsidiaries to, create, incur, assume or otherwise cause to become effective any Lien (other than permitted Liens) on any Principal Property or upon shares of stock of any Principal Subsidiary (whether such Principal Property or shares are now existing or owned or hereafter created or acquired), to secure any indebtedness of Thermo Fisher, any of its subsidiaries or any indebtedness of any other Person, unless Thermo Fisher or such subsidiary also secures all payments due under the Floating Rate Notes, the guarantees of the Floating Rate Notes and guarantees of all debt securities of any series having the benefit of this covenant (together with, if Thermo Fisher shall so determine, any other indebtedness of Thermo Fisher or any subsidiary of Thermo Fisher then existing or thereafter created ranking equally with the Floating Rate Notes, the guarantees of the Floating Rate Notes or such subsidiary indebtedness), on an equal and ratable basis with such other indebtedness so secured (or, in the case of indebtedness subordinated to the Floating Rate Notes, the guarantees of the Floating Rate Notes or such subsidiary indebtedness, prior or senior thereto, with the same relative priority as the Floating Rate Notes, the guarantees of the Floating Rate Notes or such subsidiary

indebtedness will have with respect to such subordinated indebtedness) for so long as such other indebtedness shall be so secured. The indenture contains the following exceptions to the foregoing prohibition:

- (a) Liens existing on the date when the Issuer first issued the Floating Rate Notes pursuant to the indenture;
- (b) Liens on property owned or leased by a Person existing at the time such Person is merged with or into or consolidated with Thermo Fisher or any of its subsidiaries or Thermo Fisher or one or more of its subsidiaries acquires directly or indirectly all or substantially all of the stock or assets of such Person; *provided* that such Liens were in existence prior to the contemplation of such merger, consolidation or acquisition and do not extend to any assets other than those of the Person merged into, consolidated with or acquired by Thermo Fisher or such subsidiary;
- (c) Liens on property existing at the time of acquisition thereof by Thermo Fisher or any of its subsidiaries, *provided* that such Liens were in existence prior to the contemplation of such acquisition and do not extend to any property other than the property so acquired by Thermo Fisher or such subsidiary;
- (d) Liens to secure indebtedness incurred prior to, at the time of or within 18 months after the later of the acquisition of any property and the completion of the construction, alteration, repair or improvement of any property, as the case may be, for the purpose of financing all or a part of the purchase price thereof or cost of the construction, alteration, repair or improvement thereof and Liens to the extent they secure indebtedness in excess of such purchase price or cost and for the payment of which recourse may be had only against such property;
- (e) Liens in favor of the United States or any state, territory or possession thereof (or the District of Columbia), or any department, agency, instrumentality or political subdivision of the United States or any state, territory or possession thereof (or the District of Columbia), to secure partial, progress, advance or other payments pursuant to any contract or statute or to secure any indebtedness incurred for the purpose of financing all or any part of the purchase price or the cost of constructing or improving the property subject to such Liens;
- (f) any Lien securing indebtedness of a subsidiary of Thermo Fisher owing to Thermo Fisher or to one or more of Thermo Fisher's subsidiaries;
- (g) Liens incurred or assumed in connection with the issuance of revenue bonds the interest on which is exempt from federal taxation pursuant to Section 103 of the Code;
- (h) Liens created, incurred or assumed in connection with an industrial revenue bond, pollution control bond or similar financing between Thermo Fisher or any subsidiary of Thermo Fisher and any federal, state or municipal government or other government body or quasi-governmental agency;
- (i) any extension, renewal or replacement (or successive extensions, renewals or replacements) in whole or in part of any Lien referred to in clauses (a) through (h) above, inclusive, so long as (1) the principal amount of the indebtedness secured thereby does not exceed the principal amount of indebtedness so secured at the time of the extension, renewal or replacement (except that, where an additional principal amount of indebtedness is incurred to provide funds for the completion of a specific project, the additional principal amount, and any related financing costs, may be secured by the Lien as well) and (2) the Lien is limited to the same property subject to the Lien so extended, renewed or replaced (and improvements on the property); and
- (j) any Lien on a Principal Property or the shares of stock of a Principal Subsidiary that would not otherwise be permitted by clauses (a) through (i) above, inclusive, securing indebtedness which, together with:
 - the aggregate outstanding principal amount of all other indebtedness of Thermo Fisher and its subsidiaries secured by Liens on a Principal Property or the shares of stock of a Principal Subsidiary that is permitted solely pursuant to this clause (j), and
 - the aggregate Value of existing Sale and Leaseback Transactions that are permitted solely pursuant to clause (c) of "Limitation on Sale and Leaseback Transactions" and are still in existence, does not exceed 10% of Thermo Fisher's Consolidated Net Assets.

In order to constitute a "Principal Property" under the indenture, a property must have a book value in excess of 3% of Thermo Fisher's most recently calculated Consolidated Net Assets.

Limitation on Sale and Leaseback Transactions. Thermo Fisher will not, and will not permit any of its subsidiaries to, enter into any Sale and Leaseback Transaction with respect to any Principal Property unless:

- (a) Thermo Fisher or such subsidiary could incur indebtedness, in a principal amount at least equal to the Value of such Sale and Leaseback Transaction, secured by a Lien on the Principal Property to be leased

- (without equally and ratably securing debt securities of any series having the benefit of this covenant) pursuant to clauses (a) through (i) under “Limitations on Liens” above;
- (b) Thermo Fisher or any subsidiary of Thermo Fisher applies, during the six months following the effective date of the Sale and Leaseback Transaction, an amount equal to the Value of the Sale and Leaseback Transaction to either (or a combination of) the voluntary retirement of Funded Debt or to the acquisition of property; or
- (c) the aggregate Value of such Sale and Leaseback Transaction plus the Value of all other Sale and Leaseback Transactions of Principal Properties, entered into after the date of the first issuance of the Floating Rate Notes under the indenture, permitted solely by this clause (c) and still in existence, plus the aggregate amount of all indebtedness secured by Liens permitted solely by clause (j) of “Limitations on Liens” does not exceed 10% of Consolidated Net Assets.

Business Activities. Thermo Fisher International will not engage in any activities or take any action that would be inconsistent with the definition of “finance subsidiary” within the meaning of Rule 3-10 of Regulation S-X under the Securities Act.

Certain Other Covenants. The indenture contains certain other covenants regarding, among other matters, corporate existence and reports to holders of debt securities. The Floating Rate Notes do not contain any additional financial or restrictive covenants, including covenants relating to total indebtedness, interest coverage, stock repurchases, recapitalizations, dividends and distributions to shareholders or current ratios. The provisions of the indenture do not afford holders of debt securities issued thereunder protection in the event of a sudden or significant decline in the Issuer’s credit quality or the credit quality of Thermo Fisher or in the event of a takeover, recapitalization or highly leveraged or similar transaction involving the Issuer, Thermo Fisher or any of its affiliates that may adversely affect such holders.

Consolidation, Merger and Sale of Assets. The Issuer will not consolidate with, merge with or into, or sell, convey, transfer, lease or otherwise dispose of all or substantially all of its or its subsidiaries’ property and assets taken as a whole (in one transaction or a series of related transactions) to any Person, or permit any Person to merge with or into it, unless:

- (1) the continuing Person is Thermo Fisher International or Thermo Fisher or (2) the continuing Person formed by such consolidation or into which the Issuer is merged or that acquired or leased such property and assets (the “*Surviving Person*”), shall be a Person organized and validly existing under the laws of the United States of America or any jurisdiction thereof, or a Person validly existing under the laws of Switzerland, the United Kingdom, The Netherlands or any other member state of the European Union as of the date of the indenture, and shall expressly assume, by a supplemental indenture, executed and delivered to the Trustee, all of Thermo Fisher International’s obligations under the indenture and the Floating Rate Notes;
- immediately after giving effect to such transaction, no default or event of default (each as defined in the indenture) shall have occurred and be continuing; and
- Thermo Fisher International delivers to the Trustee an officer’s certificate and opinion of counsel, in each case stating that such consolidation, merger or transfer and such supplemental indenture complies with this provision and that all conditions precedent provided for herein relating to such transaction have been complied with.

The Surviving Person will succeed to, and be substituted for, the Issuer under the indenture and the Floating Rate Notes and, except in the case of a lease, the Issuer shall be released of all obligations under the indenture and the Floating Rate Notes.

Thermo Fisher will not consolidate with, merge with or into, or sell, convey, transfer, lease or otherwise dispose of all or substantially all of its or its subsidiaries’ property and assets taken as a whole (in one transaction or a series of related transactions) to any Person, or permit any Person to merge with or into it, unless:

- (1) the continuing Person is Thermo Fisher or (2) the continuing Person formed by such consolidation or into which Thermo Fisher is merged or that acquired or leased such property and assets, shall be a Person validly existing under the laws of the United States of America or any jurisdiction thereof, or a jurisdiction

outside of the United States, and shall expressly assume, by a supplemental indenture, executed and delivered to the Trustee, all of Thermo Fisher's obligations under the indenture and the Floating Rate Notes;

- immediately after giving effect to such transaction, no default or event of default (each as defined in the indenture) shall have occurred and be continuing; and
- Thermo Fisher delivers to the Trustee an officer's certificate and opinion of counsel, in each case stating that such consolidation, merger or transfer and such supplemental indenture complies with this provision and that all conditions precedent provided for herein relating to such transaction have been complied with.

Definition of Certain Terms. The following are the meanings of certain terms that are important in understanding the covenants described above with respect to Floating Rate Notes.

“Capital Lease Obligation” means, at the time any determination thereof is to be made, the amount of the liability in respect of a capital lease that would at that time be required to be capitalized on a balance sheet in accordance with U.S. GAAP as in effect on the date of the indenture.

“Consolidated Net Assets” means the consolidated total assets of Thermo Fisher and its subsidiaries as reflected in the most recent balance sheet of Thermo Fisher prepared in accordance with U.S. GAAP as in effect at the time of such determination, less (a) all current liabilities (excluding any notes and loans payable, current maturities of long-term debt, the current portion of deferred revenue and obligations under capital leases) and (b) acquisition-related intangible assets in accordance with U.S. GAAP as in effect at the time of such determination. Consolidated Net Assets includes the goodwill of Thermo Fisher and its subsidiaries.

“Funded Debt” means, as of any date of determination, Thermo Fisher's indebtedness or the indebtedness of a subsidiary of Thermo Fisher maturing by its terms more than one year after its creation and indebtedness classified as long-term debt under U.S. GAAP as in effect on the date of the indenture, and in each case ranking at least *pari passu* with the Floating Rate Notes, the Thermo Fisher guarantee of the Floating Rate Notes or the other senior indebtedness of such subsidiary of Thermo Fisher.

“indebtedness” means, with respect to any specified Person, any indebtedness of such Person, whether or not contingent:

- (1) in respect of borrowed money;
- (2) evidenced by bonds, notes, debentures or similar instruments or letters of credit (or reimbursement agreements in respect thereof); and
- (3) in respect of Capital Lease Obligations.

In addition, the term “indebtedness” includes (x) all indebtedness (as defined above) of others secured by a Lien on any asset of the specified Person (whether or not such indebtedness is assumed by the specified Person), *provided* that the amount of such indebtedness will be the lesser of (A) the fair market value of such asset at such date of determination and (B) the amount of such indebtedness, and (y) to the extent not otherwise included, the guarantee by the specified Person of any indebtedness (as defined above) of any other Person.

“Lien” means, with respect to any asset, any mortgage, lien, pledge, charge, security interest or encumbrance of any kind in respect of such asset, whether or not filed, recorded or otherwise perfected under applicable law, including any conditional sale or other title retention agreement.

“Original Issue Discount Security” means any debt security which provides for an amount less than the principal amount thereof to be due and payable upon a declaration of acceleration of maturity thereof pursuant to the indenture.

“Person” means any individual, corporation, limited liability company, partnership, joint venture, joint-stock company, association, trust, unincorporated organization or government or any agency or political subdivision of a government or governmental agency.

“*Principal Property*” means any single parcel of real property or any permanent improvement thereon (i) owned by Thermo Fisher or any of its subsidiaries located in the United States, including Thermo Fisher’s principal corporate office, any manufacturing facility or plant or any portion thereof and (ii) having a book value, as of the date of determination, in excess of 3% of Thermo Fisher’s most recently calculated Consolidated Net Assets. Principal Property does not include any property that Thermo Fisher’s board of directors has determined not to be of material importance to the business conducted by Thermo Fisher and its subsidiaries, taken as a whole.

“*Principal Subsidiary*” means any direct or indirect subsidiary of Thermo Fisher that owns a Principal Property.

“*Sale and Leaseback Transaction*” means any arrangement with any Person providing for the leasing by Thermo Fisher or any subsidiary of any Principal Property which has been or is to be sold or transferred by Thermo Fisher or such subsidiary to such Person, excluding (1) temporary leases for a term, including renewals at the option of the lessee, of not more than three years, (2) leases between Thermo Fisher and a subsidiary or between subsidiaries of Thermo Fisher, (3) leases of a Principal Property executed by the time of, or within 12 months after the latest of, the acquisition, the completion of construction or improvement, or the commencement of commercial operation of the property and (4) arrangements pursuant to any provision of law with an effect similar to the former Section 168(f)(8) of the Internal Revenue Code of 1954, as amended.

“*U.S. GAAP*” means generally accepted accounting principles set forth in the FASB Accounting Standards Codification or in such other statements by such other entity as have been approved by a significant segment of the accounting profession, which are in effect from time to time.

“*Value*” means, with respect to a Sale and Leaseback Transaction, an amount equal to the net present value of the lease payments (other than amounts required to be paid on account of property taxes, maintenance, repairs, insurance, water rates and other items that do not constitute payments for property rights) with respect to the term of the lease remaining on the date as of which the amount is being determined, without regard to any renewal or extension options contained in the lease, discounted at the weighted average interest rate on the debt securities of all series (including the yield to maturity on any Original Issue Discount Securities) which are outstanding on the effective date of such Sale and Leaseback Transaction.

Fixed Rate Notes

Limitations on Liens. The Issuer will not, and will not permit any of its subsidiaries to, create, incur, assume or otherwise cause to become effective any Lien (other than permitted Liens) on any Principal Property or upon shares of stock of any Principal Subsidiary (whether such Principal Property or shares are now existing or owned or hereafter created or acquired), to secure any indebtedness of the Issuer, any of its subsidiaries or any indebtedness of any other Person, unless the Issuer or such subsidiary also secures all payments due under the Fixed Rate Notes and all senior debt securities of any series having the benefit of this covenant (together with, if the Issuer shall so determine, any other indebtedness of the Issuer or any subsidiary of the Issuer then existing or thereafter created ranking equally with the Fixed Rate Notes), on an equal and ratable basis with such other indebtedness so secured (or, in the case of indebtedness subordinated to the Fixed Rate Notes, prior or senior thereto, with the same relative priority as the Fixed Rate Notes issued pursuant to the indenture will have with respect to such subordinated indebtedness) for so long as such other indebtedness shall be so secured. The indenture contains the following exceptions to the foregoing prohibition:

- (a) Liens existing on the date when the Issuer first issued the applicable series of Fixed Rate Notes pursuant to the indenture;
- (b) Liens on property owned or leased by a Person existing at the time such Person is merged with or into or consolidated with the Issuer or any subsidiary of the Issuer or the Issuer or one or more of its subsidiaries acquires directly or indirectly all or substantially all of the stock or assets of such Person; *provided* that such Liens were in existence prior to the contemplation of such merger, consolidation or acquisition and do not extend to any assets other than those of the Person merged into, consolidated with or acquired by the Issuer or such subsidiary;
- (c) Liens on property existing at the time of acquisition thereof by the Issuer or any subsidiary of the Issuer, *provided* that such Liens were in existence prior to the contemplation of such acquisition and do not extend to any property other than the property so acquired by the Issuer or such subsidiary;

- (d) Liens to secure indebtedness incurred prior to, at the time of or within 18 months after the later of the acquisition of any property and the completion of the construction, alteration, repair or improvement of any property, as the case may be, for the purpose of financing all or a part of the purchase price thereof or cost of the construction, alteration, repair or improvement thereof and Liens to the extent they secure indebtedness in excess of such purchase price or cost and for the payment of which recourse may be had only against such property;
- (e) Liens in favor of the United States or any state, territory or possession thereof (or the District of Columbia), or any department, agency, instrumentality or political subdivision of the United States or any state, territory or possession thereof (or the District of Columbia), to secure partial, progress, advance or other payments pursuant to any contract or statute or to secure any indebtedness incurred for the purpose of financing all or any part of the purchase price or the cost of constructing or improving the property subject to such Liens;
- (f) any Lien securing indebtedness of a subsidiary owing to the Issuer or to one or more of its subsidiaries;
- (g) Liens incurred or assumed in connection with the issuance of revenue bonds the interest on which is exempt from federal taxation pursuant to Section 103 of the Internal Revenue Code;
- (h) Liens created, incurred or assumed in connection with an industrial revenue bond, pollution control bond or similar financing between the Issuer or any subsidiary of the Issuer and any federal, state or municipal government or other government body or quasi-governmental agency;
- (i) any extension, renewal or replacement (or successive extensions, renewals or replacements) in whole or in part of any Lien referred to in clauses (a) through (h) above, inclusive, so long as (1) the principal amount of the indebtedness secured thereby does not exceed the principal amount of indebtedness so secured at the time of the extension, renewal or replacement (except that, where an additional principal amount of indebtedness is incurred to provide funds for the completion of a specific project, the additional principal amount, and any related financing costs, may be secured by the Lien as well) and (2) the Lien is limited to the same property subject to the Lien so extended, renewed or replaced (and improvements on the property); and
- (j) any Lien on a Principal Property or the shares of stock of a Principal Subsidiary that would not otherwise be permitted by clauses (a) through (i) above, inclusive, securing indebtedness which, together with:
 - the aggregate outstanding principal amount of all other indebtedness of the Issuer and its subsidiaries secured by Liens on a Principal Property or the shares of stock of a Principal Subsidiary that is permitted solely pursuant to this clause (j), and
 - the aggregate Value of existing Sale and Leaseback Transactions that are permitted solely pursuant to clause (c) of “Limitation on Sale and Leaseback Transactions” and are still in existence, does not exceed 10% of Consolidated Net Assets.

In order to constitute a “Principal Property” under the indenture, a property must have a book value in excess of 3% of the most recently calculated Consolidated Net Assets.

Limitation on Sale and Leaseback Transactions. The Issuer will not, and will not permit any of its subsidiaries to, enter into any Sale and Leaseback Transaction with respect to any Principal Property unless:

- (a) the Issuer or such subsidiary could incur indebtedness, in a principal amount at least equal to the Value of such Sale and Leaseback Transaction, secured by a Lien on the Principal Property to be leased (without equally and ratably securing debt securities of any series having the benefit of this covenant) pursuant to clauses (a) through (i) under “Limitations on Liens” above;
- (b) the Issuer applies, during the six months following the effective date of the Sale and Leaseback Transaction, an amount equal to the Value of the Sale and Leaseback Transaction to either (or a combination of) the voluntary retirement of Funded Debt or to the acquisition of property; or
- (c) the aggregate Value of such Sale and Leaseback Transaction plus the Value of all other Sale and Leaseback Transactions of Principal Properties entered into after the date of the issuance of the Fixed Rate Notes permitted solely by this clause (c) and still in existence, plus the aggregate amount of all indebtedness secured by Liens permitted solely by clause (j) of “Limitations on Liens” does not exceed 10% of Consolidated Net Assets.

Certain Other Covenants. The indenture contains certain other covenants regarding, among other matters, corporate existence and reports to holders of Fixed Rate Notes. The Fixed Rate Notes do not contain any additional financial

or restrictive covenants, including covenants relating to total indebtedness, interest coverage, stock repurchases, recapitalizations, dividends and distributions to shareholders or current ratios. The provisions of the indenture do not afford holders of Fixed Rate Notes issued thereunder protection in the event of a sudden or significant decline in the Issuer's credit quality or in the event of a takeover, recapitalization or highly leveraged or similar transaction involving the Issuer or any of its affiliates that may adversely affect such holders.

Consolidation, Merger and Sale of Assets. The Issuer will not consolidate with, merge with or into, or sell, convey, transfer, lease or otherwise dispose of all or substantially all of its and its subsidiaries property and assets taken as a whole (in one transaction or a series of related transactions) to any Person, or permit any Person to merge with or into the Issuer, unless:

- the Issuer shall be the continuing Person, or the Person (if other than the Issuer) formed by such consolidation or into which the Issuer is merged or that acquired or leased such property and assets (the "*Surviving Person*"), shall be a Person organized and validly existing under the laws of the United States of America or any jurisdiction thereof, or, subject to certain conditions (including an obligation to pay additional amounts in respect of withholding taxes), a jurisdiction outside the United States, and shall expressly assume, by a supplemental indenture, executed and delivered to the Trustee, all of the Issuer's obligations under the indenture and the Fixed Rate Notes;
- immediately after giving effect to such transaction, no default or event of default (each as defined in the indenture) shall have occurred and be continuing; and
- the Issuer delivers to the Trustee an officer's certificate and opinion of counsel, in each case stating that such consolidation, merger or transfer and such supplemental indenture complies with this provision and that all conditions precedent provided for herein relating to such transaction have been complied with.

The Surviving Person will succeed to, and be substituted for, the Issuer under the indenture and the Fixed Rate Notes and, except in the case of a lease, the Issuer shall be released of all obligations under the indenture and the Fixed Rate Notes.

Definition of Certain Terms. The following are the meanings of terms that are important in understanding the covenants described above with respect to the Fixed Rate Notes.

"*Capital Lease Obligation*" means, at the time any determination thereof is to be made, the amount of the liability in respect of a capital lease that would at that time be required to be capitalized on a balance sheet in accordance with U.S. GAAP as in effect on the date of the indenture.

"*Consolidated Net Assets*" means the consolidated total assets of the Issuer and its subsidiaries as reflected in its most recent balance sheet prepared in accordance with U.S. GAAP as in effect at the time of such determination, less (a) all current liabilities (excluding any notes and loans payable, current maturities of long-term debt, the current portion of deferred revenue and obligations under capital leases) and (b) acquisition-related intangible assets in accordance with U.S. GAAP in effect at the time of such determination. Consolidated Net Assets includes goodwill of the Issuer and its subsidiaries.

"*Funded Debt*" means, as of any date of determination, the Issuer's indebtedness or the indebtedness of a subsidiary maturing by its terms more than one year after its creation and indebtedness classified as long-term debt under U.S. GAAP as in effect on the date of the indenture, and in each case ranking at least *pari passu* with the senior debt securities.

"*indebtedness*" means, with respect to any specified Person, any indebtedness of such Person, whether or not contingent:

- 1) in respect of borrowed money;
- 2) evidenced by bonds, notes, debentures or similar instruments or letters of credit (or reimbursement agreements in respect thereof); and
- 3) in respect of Capital Lease Obligations.

In addition, the term “indebtedness” includes (x) all indebtedness (as defined above) of others secured by a Lien on any asset of the specified Person (whether or not such indebtedness is assumed by the specified Person), *provided* that the amount of such indebtedness will be the lesser of (A) the fair market value of such asset at such date of determination and (B) the amount of such indebtedness, and (y) to the extent not otherwise included, the guarantee by the specified Person of any indebtedness (as defined above) of any other Person.

“*Lien*” means, with respect to any asset, any mortgage, lien, pledge, charge, security interest or encumbrance of any kind in respect of such asset, whether or not filed, recorded or otherwise perfected under applicable law, including any conditional sale or other title retention agreement.

“*Original Issue Discount Security*” means any debt security which provides for an amount less than the principal amount thereof to be due and payable upon a declaration of acceleration of maturity thereof pursuant to the indenture.

“*Person*” means any individual, corporation, partnership, limited liability company, joint venture, joint-stock company, association, trust, unincorporated organization or government or any agency or political subdivision of a government or governmental agency.

“*Principal Property*” means any single parcel of real property or any permanent improvement thereon (i) owned by the Issuer or any of its subsidiaries located in the United States, including the Issuer’s principal corporate office, any manufacturing facility or plant or any portion thereof and (ii) having a book value, as of the date of determination, in excess of 3% of the most recently calculated Consolidated Net Assets. Principal Property does not include any property that the Issuer’s board of directors has determined not to be of material importance to the business conducted by the Issuer and its subsidiaries, taken as a whole.

“*Principal Subsidiary*” means any direct or indirect subsidiary of the Issuer that owns a Principal Property.

“*Sale and Leaseback Transaction*” means any arrangement with any Person providing for the leasing by the Issuer or any subsidiary of any Principal Property which has been or is to be sold or transferred by the Issuer or such subsidiary to such Person, excluding (1) temporary leases for a term, including renewals at the option of the lessee, of not more than three years, (2) leases between the Issuer and a subsidiary or between subsidiaries of the Issuer, (3) leases of a Principal Property executed by the time of, or within 12 months after the latest of, the acquisition, the completion of construction or improvement, or the commencement of commercial operation of the property, and (4) arrangements pursuant to any provision of law with an effect similar to the former Section 168(f)(8) of the Internal Revenue Code of 1954, as amended.

“*U.S. GAAP*” means generally accepted accounting principles set forth in the FASB Accounting Standards Codification or in such other statements by such other entity as have been approved by a significant segment of the accounting profession, which are in effect from time to time.

“*Value*” means, with respect to a Sale and Leaseback Transaction, an amount equal to the net present value of the lease payments (other than amounts required to be paid on account of property taxes, maintenance, repairs, insurance, water rates and other items that do not constitute payments for property rights) with respect to the term of the lease remaining on the date as of which the amount is being determined, without regard to any renewal or extension options contained in the lease, discounted at the weighted average interest rate on the debt securities of all series (including the yield to maturity on any Original Issue Discount Securities) which are outstanding on the effective date of such Sale and Leaseback Transaction.

Events of Default

Floating Rate Notes

The indenture defines an Event of Default with respect to the Floating Rate Notes as any of the following:

- Default in the payment of the principal or any premium on the Floating Rate Notes when due (whether at maturity, upon acceleration, redemption or otherwise);
- Default for 30 days in the payment of interest on the Floating Rate Notes when due;
- Failure by the Issuer or Thermo Fisher to observe or perform any other term of the indenture for a period of 90 days after the Issuer or Thermo Fisher, as applicable, receives a notice of default stating the Issuer or Thermo Fisher is in breach. The notice must be sent by either the Trustee or holders of 25% of the principal amount of Floating Rate Notes of the affected series;
- (1) Failure by the Issuer or Thermo Fisher to pay indebtedness for money the Issuer or Thermo Fisher borrowed or guaranteed the payment of in an aggregate principal amount of at least \$150 million at the later of final maturity and the expiration of any related applicable grace period and such defaulted payment shall not have been made, waived or extended within 30 days or (2) acceleration of the maturity of any indebtedness for money the Issuer or Thermo Fisher borrowed or guaranteed the payment of in an aggregate principal amount of at least \$150 million, if such indebtedness has not been discharged in full or such acceleration has not been rescinded or annulled within 30 days; *provided, however*, that, if the default under the instrument is cured by the Issuer or Thermo Fisher, or waived by the holders of the indebtedness, in each case as permitted by the governing instrument, then the Event of Default under the indenture governing the Floating Rate Notes caused by such default will be deemed likewise to be cured or waived;
- Certain events in bankruptcy, insolvency or reorganization with respect to the Issuer or Thermo Fisher; and
- The guarantee of the obligations under the Floating Rate Notes is determined in a final, non-appealable judgment to be unenforceable or invalid or such guarantee is asserted in writing by Thermo Fisher International or Thermo Fisher to no longer be in full force and effect and enforceable in accordance with its terms.

The indenture provides that the Trustee may withhold notice to the holders of any series of debt securities issued thereunder of any default if the Trustee's board of directors, executive committee, or a trust committee of directors or trustees and/or certain officers of the Trustee in good faith determine it in the interest of such holders to do so.

Remedies If an Event of Default Occurs. The indenture provides that if an Event of Default has occurred with respect to a series of debt securities and has not been cured, the Trustee or the holders of not less than 25% in principal amount of the debt securities of that series may declare the entire principal amount of all the debt securities of that series to be due and immediately payable. This is called a declaration of acceleration of maturity. If an Event of Default occurs because of certain events in bankruptcy, insolvency or reorganization with respect to the Issuer or Thermo Fisher, the principal amount of all the debt securities will be automatically accelerated, without any action by the Trustee or any holder. The holders of a majority in aggregate principal amount of the debt securities of the affected series may by written notice to the Issuer, Thermo Fisher and the Trustee may, on behalf of the holders of the debt securities of the affected series, rescind an acceleration or waive any existing Default or Event of Default and its consequences under the indenture, if the rescission would not conflict with any judgment or decree, except a continuing Default or Event of Default in the payment of principal of, premium on, if any, or interest, if any, on, such debt securities.

Where the Trustee has some special duties, the Trustee is not required to take any action under the indenture at the request of any holders unless the holders offer the Trustee protection from expenses and liability (called an "*indemnity*"). If indemnity satisfactory to the Trustee is provided, the holders of a majority in principal amount of the outstanding debt securities of the affected series may direct the time, method and place of conducting any lawsuit or other formal legal action seeking any remedy available to the Trustee. Subject to certain exceptions contained in the indenture, these majority holders may also direct the Trustee in performing any other action under the indenture.

Before a holder of debt securities bypasses the Trustee and brings its own lawsuit or other formal legal action or takes other steps to enforce its rights or protect its interests relating to the debt securities, the following must occur:

- The holder of debt securities must give the Trustee written notice that an Event of Default has occurred and remains uncured.
- The holders of 25% in principal amount of all outstanding debt securities of the affected series must make a written request that the Trustee take action because of the Event of Default, and must offer reasonable indemnity to the Trustee against the cost and other liabilities of taking that action.
- The Trustee must have failed to take action for 60 days after receipt of the above notice and offer of indemnity and during such 60-day period, the Trustee has not received a contrary instruction from holders of a majority in principal amount of all outstanding debt securities of that series.

However, a holder of notes is entitled at any time to bring a lawsuit for the payment of money due on its debt securities on or after the due date of that payment.

The Issuer will furnish to the Trustee every year a written statement of one of its officers certifying that to such officer's knowledge the Issuer is in compliance with the indenture and the debt securities, or else specifying any default.

Fixed Rate Notes

The indenture defines an Event of Default with respect to any series of Fixed Rate Notes issued pursuant to the indenture. Events of Default on the Fixed Rate Notes are any of the following:

- Default in the payment of the principal or any premium on Fixed Rate Notes when due (whether at maturity, upon acceleration, redemption or otherwise);
- Default for 30 days in the payment of interest on Fixed Rate Notes when due;
- Failure by Thermo Fisher to observe or perform any other term of the indenture for a period of 90 days after it receives a notice of default stating that it is in breach. The notice must be sent by either the Trustee or holders of 25% of the principal amount of the Fixed Rate Notes of the affected series;
- (1) Failure by Thermo Fisher to pay indebtedness for money it borrowed or guaranteed the payment of in an aggregate principal amount of at least \$100 million, in the case of the 2022 Notes, 2024 Notes, April 2025 Notes, 2026 Notes, 2027 Notes, September 2028 Notes, 2029 Notes or 2037 Notes, or \$150 million, in the case of the March 2025 Notes, March 2028 Notes, 2031 Notes, 2039 Notes or 2049 Notes, at the later of final maturity and the expiration of any related applicable grace period and such defaulted payment shall not have been made, waived or extended within 30 days or (2) acceleration of the maturity of any indebtedness for money that the Issuer borrowed or guaranteed the payment of in an aggregate principal amount of at least \$100 million, in the case of the 2022 Notes, 2024 Notes, April 2025 Notes, 2026 Notes, 2027 Notes, September 2028 Notes, 2029 Notes or 2037 Notes, or \$150 million, in the case of the March 2025 Notes, March 2028 Notes, 2031 Notes, 2039 Notes or 2049 Notes, if such indebtedness has not been discharged in full or such acceleration has not been rescinded or annulled within 30 days; *provided, however*, that, if the default under the instrument is cured by the Issuer, or waived by the holders of the indebtedness, in each case as permitted by the governing instrument, then the Event of Default under the indenture governing the Fixed Rate Notes caused by such default will be deemed likewise to be cured or waived; and
- Certain events in bankruptcy, insolvency or reorganization with respect to Thermo Fisher.

The indenture provides that the Trustee may withhold notice to the holders of any series of senior debt securities issued thereunder of any default if the Trustee's board of directors, executive committee, or a trust committee of directors or trustees and/or certain officers of the Trustee in good faith determine it in the interest of such holders to do so.

Remedies If an Event of Default Occurs. The indenture provides that if an Event of Default has occurred with respect to a series of Fixed Rate Notes and has not been cured, the Trustee or the holders of not less than 25% in principal amount of the Fixed Rate Notes of that series may declare the entire principal amount of all the Fixed Rate Notes of that series, and accrued interest, if any, to be due and immediately payable. This is called a declaration of acceleration of maturity. If an Event of Default occurs because of certain events in bankruptcy, insolvency or reorganization with respect to the Issuer, the principal amount of all the senior debt securities will be automatically accelerated, without any action by the Trustee or any holder. The holders of a majority in aggregate principal amount of the senior debt securities of the affected series may by written notice to the Issuer and the Trustee may, on behalf of the holders of the senior debt securities of the affected series, rescind an acceleration or waive any existing Default or Event of Default and its consequences under the indenture, if the rescission would not conflict with any judgment or decree, except a continuing Default or Event of Default in the payment of principal of, premium on, if any, or interest, if any, on, such senior debt securities.

Except as may otherwise be provided in the indenture in cases of default, where the Trustee has some special duties, the Trustee is not required to take any action under the indenture at the request of any holders unless the holders offer the Trustee protection from expenses and liability (called an “*indemnity*”). If indemnity satisfactory to the Trustee is provided, the holders of a majority in principal amount of the outstanding notes of the affected series may direct the time, method and place of conducting any lawsuit or other formal legal action seeking any remedy available to the Trustee. Subject to certain exceptions contained in the indenture, these majority holders may also direct the Trustee in performing any other action under the indenture.

Before a holder of Fixed Rate Notes bypasses the Trustee and brings its own lawsuit or other formal legal action or takes other steps to enforce its rights or protect its interests relating to the notes, the following must occur:

- The holder must give the Trustee written notice that an Event of Default has occurred and remains uncured.
- The holders of 25% in principal amount of all outstanding notes of the affected series must make a written request that the Trustee take action because of the Event of Default and must offer reasonable indemnity to the Trustee against the cost and other liabilities of taking that action.
- The Trustee must have failed to take action for 60 days after receipt of the above notice and offer of indemnity and during such 60-day period, the Trustee has not received a contrary instruction from holders of a majority in principal amount of all outstanding notes of such series.

However, a holder of Fixed Rate Notes is entitled at any time to bring a lawsuit for the payment of money due on its Fixed Rate Notes on or after the due date of that payment.

The Issuer will furnish to the Trustee every year a written statement of one to two of its officers certifying that to their knowledge the Issuer is in compliance with the indenture and the senior debt securities, or else specifying any default.

Satisfaction and Discharge

Floating Rate Notes

The indenture will cease to be of any further effect with respect to the Floating Rate Notes and the related guarantee, and the Trustee, upon the Issuer’s demand and at its expense, will execute appropriate instruments acknowledging the satisfaction and discharge of the indenture with respect to such Floating Rate Notes and the related guarantee if:

- the Issuer or Thermo Fisher have delivered to the Trustee for cancellation all such Floating Rate Notes theretofore authenticated under the indenture; or
- all Floating Rate Notes of that series not theretofore delivered to the Trustee for cancellation shall have become due and payable or by their terms will become due and payable within one year or are to be called for redemption within one year and, in each such case, the Issuer or Thermo Fisher shall have deposited with the Trustee sufficient cash or U.S. government or U.S. government agency notes or bonds (or

equivalent government obligations in the case of debt securities denominated in a currency other than U.S. dollars) that will generate enough cash to pay, at maturity or upon redemption, all such debt securities; and

if, in either case, the Issuer or Thermo Fisher also pay or cause to be paid all sums payable under the indenture with respect to such Floating Rate Notes, and the Issuer or Thermo Fisher delivers to the Trustee an officer's certificate and an opinion of counsel, each stating that these conditions with respect to such Floating Rate Notes have been satisfied.

Fixed Rate Notes

The indenture will cease to be of further effect with respect to a series of Fixed Rate Notes and the Trustee, upon the Issuer's demand and at its expense, will execute appropriate instruments acknowledging the satisfaction and discharge of the indenture upon compliance with certain conditions, including:

- the Issuer having paid all sums payable by it under the indenture, as and when the same shall be due and payable;
- the Issuer having delivered to the Trustee for cancellation all Fixed Rate Notes theretofore authenticated under the indenture;
- all Fixed Rate Notes of any series outstanding under the indenture not theretofore delivered to the Trustee for cancellation shall have become due and payable or are by their terms to become due and payable within one year and the Issuer shall have deposited with the Trustee sufficient cash or U.S. government or U.S. government agency notes or bonds that will generate enough cash to pay, at maturity or upon redemption, all such Fixed Rate Notes of any series outstanding under the indenture; or
- the Issuer having delivered to the Trustee an officer's certificate and an opinion of counsel, each stating that these conditions have been satisfied.

Defeasance

Floating Rate Notes

Full Defeasance. The Issuer can legally release itself and Thermo Fisher from any payment or other obligations on the Floating Rate Notes and the related guarantee (called "*full defeasance*") if the following conditions are met:

- The Issuer deposits or Thermo Fisher deposits in trust for the benefit of holders of Floating Rate Notes of the same series a combination of money and U.S. government or U.S. government agency notes or bonds (or equivalent government obligations in the case of Floating Rate Notes denominated in a currency other than U.S. dollars) that will generate enough cash to make interest, principal, any premium and any other payments on the Floating Rate Notes of that series on their various due dates.
- There is a change in current U.S. federal tax law or an IRS ruling that lets the Issuer or Thermo Fisher make the above deposit without causing holders of Floating Rate Notes to be taxed on the Floating Rate Notes any differently than if the Issuer or Thermo Fisher did not make the deposit and instead repaid the Floating Rate Notes themselves when due. Under current U.S. federal tax law, the deposit and the Issuer's and Thermo Fisher's legal release from the debt securities and the related guarantee would be treated as though the Issuer took back a holder's Floating Rate Notes and gave such holder its share of the cash and debt securities or bonds deposited in trust. In that event, a holder of Floating Rate Notes could recognize gain or loss on the Floating Rate Notes it give back to the Issuer.
- The Issuer delivers or Thermo Fisher delivers to the Trustee a legal opinion of counsel confirming the tax law change or ruling described above.

If the Issuer ever did accomplish full defeasance, as described above, a holder of Floating Rate Notes would have to rely solely on the trust deposit for repayment of the Floating Rate Notes. You could not look to the Issuer or Thermo Fisher for repayment in the event of any shortfall.

However, even if the Issuer makes or Thermo Fisher makes the deposit in trust and opinion delivery arrangements discussed above, a number of obligations relating to the Floating Rate Notes will remain. These include the obligations:

- to register the transfer and exchange of Floating Rate Notes;
- to replace mutilated, destroyed, lost or stolen Floating Rate Notes;
- to maintain paying agencies; and
- to hold money for payment in trust.

Covenant Defeasance. Without any change of current U.S. federal tax law, the Issuer or Thermo Fisher can make the same type of deposit described above and be released from some of the covenants on the Floating Rate Notes and related guarantee. This is called “*covenant defeasance*.” In that event, a holder of Floating Rate Notes would lose the protection of those covenants but would gain the protection of having money and securities set aside in trust to repay the Floating Rate Notes. In order to achieve covenant defeasance, the Issuer or Thermo Fisher must do the following:

- The Issuer or Thermo Fisher must deposit in trust for the benefit of holders Floating Rate Notes of the same series a combination of money and U.S. government or U.S. government agency notes or bonds (or equivalent government obligations in the case of Floating Rate Notes denominated in a currency other than U.S. dollars) that will generate enough cash to make interest, principal, any premium and any other payments on the Floating Rate Notes on their various due dates.
- The Issuer or Thermo Fisher must deliver to the Trustee a legal opinion of counsel confirming that under current U.S. federal income tax law the Issuer or Thermo Fisher may make the above deposit without causing holders of such series of Floating Rate Notes to be taxed on the Floating Rate Notes any differently than if the Issuer or Thermo Fisher did not make the deposit and instead repaid the Floating Rate Notes when due.

If the Issuer accomplishes covenant defeasance, a holder of such Floating Rate Notes can still look to the Issuer or Thermo Fisher for repayment of the Floating Rate Notes or the related guarantee if there were a shortfall in the trust deposit. In fact, if one of the Events of Default occurred (such as the Issuer’s or Thermo Fisher’s bankruptcy) and the Floating Rate Notes become immediately due and payable, there may be such a shortfall. Depending on the event causing the default, a holder of such Floating Rate Notes may not be able to obtain payment of the shortfall.

Fixed Rate Notes

Full Defeasance. The Issuer can legally release itself from any payment or other obligations on the Fixed Rate Notes of any series (called “*full defeasance*”) if the following conditions are met:

- The Issuer deposits in trust for the benefit of holders of Fixed Rate Notes of the same series a combination of money and U.S. government or U.S. government agency notes or bonds that will generate enough cash to make interest, principal, any premium and any other payments on the Fixed Rate Notes of that series on their various due dates.
- There is a change in current U.S. federal tax law or an IRS ruling that lets the Issuer make the above deposit without causing holders of Fixed Rate Notes to be taxed on the Fixed Rate Notes any differently than if the Issuer did not make the deposit and instead repaid the Fixed Rate Notes itself when due. Under current U.S. federal tax law, the deposit and the Issuer’s legal release from the Fixed Rate Notes would be treated as though the Issuer took back a holder’s Fixed Rate Notes and gave such holder its share of the cash and debt

- securities or bonds deposited in trust. In that event, a holder of Fixed Rate Notes could recognize gain or loss on the Fixed Rate Notes it give back to the Issuer.
- The Issuer delivers to the Trustee a legal opinion of its counsel confirming the tax law change or ruling described above.

If the Issuer ever did accomplish full defeasance, as described above, a holder of Fixed Rate Notes would have to rely solely on the trust deposit for repayment of the debt securities. Such holders could not look to the Issuer for repayment in the event of any shortfall.

However, even if the Issuer makes the deposit in trust and opinion delivery arrangements discussed above, a number of its obligations relating to the Fixed Rate Notes will remain. These include the Issuer's obligations:

- to register the transfer and exchange of Fixed Rate Notes;
- to replace mutilated, destroyed, lost or stolen Fixed Rate Notes;
- to maintain paying agencies; and
- to hold money for payment in trust.

Covenant Defeasance. Without any change of current U.S. federal tax law, the Issuer can make the same type of deposit described above and be released from some of the covenants on the Fixed Rate Notes of any series. This is called "covenant defeasance." In that event, holders of Fixed Rate Notes would lose the protection of those covenants but would gain the protection of having money and securities set aside in trust to repay the Fixed Rate Notes. In order to achieve covenant defeasance, the Issuer must do the following:

- The Issuer must deposit in trust for the benefit of holders of Fixed Rate Notes of the same series a combination of money and U.S. government or U.S. government agency notes or bonds that will generate enough cash to make interest, principal, any premium and any other payments on the Fixed Rate Notes of that series on their various due dates.
- The Issuer must deliver to the Trustee a legal opinion of its counsel confirming that under current U.S. federal income tax law the Issuer may make the above deposit without causing holders of such series of Fixed Rate Notes to be taxed on the Fixed Rate Notes any differently than if it did not make the deposit and instead repaid the Fixed Rate Notes itself when due.

If the Issuer accomplishes covenant defeasance, a holder of such Fixed Rate Notes can still look to it for repayment of the Fixed Rate Notes if there were a shortfall in the trust deposit. In fact, if one of the Events of Default occurred (such as the Issuer's bankruptcy) and the Fixed Rate Notes become immediately due and payable, there may be such a shortfall. Depending on the event causing the default, a holder of such Fixed Rate Notes may not be able to obtain payment of the shortfall.

Modification and Waiver

Floating Rate Notes

There are three types of changes the Issuer can make to the indenture and the Floating Rate Notes.

Changes Requiring Approval of the Holder. First, there are changes that cannot be made to the Floating Rate Notes without specific approval of each holder. The following is a list of those types of changes:

- change the stated maturity of the principal or interest on the Floating Rate Notes;
- reduce any amounts due on the Floating Rate Notes;
- reduce the amount of principal payable upon acceleration of the maturity of the Floating Rate Notes following an Event of Default;
- change the place or currency of payment for the Floating Rate Notes;
- impair the holder's right to sue for the enforcement of any payment on or with respect to the Floating Rate Notes;

- release Thermo Fisher from its obligations in respect of the guarantee of the Floating Rate Notes or modify Thermo Fisher's obligations thereunder other than in accordance with the provisions of the indenture;
- reduce the percentage in principal amount of the Floating Rate Notes, the approval of whose holders is needed to modify or amend the indenture or the Floating Rate Notes;
- reduce the percentage in principal amount of the Floating Rate Notes, the approval of whose holders is needed to waive compliance with certain provisions of the indenture or to waive certain defaults; and
- modify any other aspect of the provisions dealing with modification and waiver of the indenture, except to increase the percentage required for any modification or to provide that other provisions of the indenture may not be modified or waived without consent of the holder of each Floating Rate Note affected.

Changes Not Requiring Approval. The second type of change does not require any vote by holders of the Floating Rate Notes. This following is a list of those types of changes:

- cure any ambiguity, defect or inconsistency;
- evidence the succession of another entity to the Issuer's obligations or the obligations of Thermo Fisher under the indenture;
- provide for uncertificated Floating Rate Notes in addition to or in place of certificated Floating Rate Notes;
- add to the Issuer's covenants or Thermo Fisher's covenants for the benefit of holders of outstanding Floating Rate Notes or to surrender any right or power the Issuer has or Thermo Fisher has under the indenture;
- add additional events of default;
- secure the Floating Rate Notes;
- make any change that does not adversely affect the rights of any holder of Floating Rate Notes in any material respect;
- issue additional Floating Rate Notes of any series;
- evidence and provide for a successor trustee and add to or change the provisions of the indenture to provide for or facilitate the administration of the trusts under the indenture; or
- comply with requirements of the SEC in order to effect or maintain the qualification of the indenture under the Trust Indenture Act.

Changes Requiring a Majority Vote. Any other change to the indenture and the Floating Rate Notes would require the approval of the holders of a majority in principal amount of the Floating Rate Notes, or, if the change affects the Floating Rate Notes as well as the debt securities of one or more other series issued under the indenture, it must be approved by the holders of a majority in principal amount of the Floating Rate Notes and each other series of debt securities affected by the change. In each case, the required approval must be given by written consent.

The same vote would be required for the Issuer to obtain a waiver of a past default. However, the Issuer cannot obtain a waiver of a payment default or a waiver with respect to any other aspect of the indenture and the Floating Rate Notes listed in the first category described previously under "Changes Requiring Approval of the Holder" unless the Issuer obtains your individual consent to the waiver.

Fixed Rate Notes

There are three types of changes the Issuer can make to the indenture and the Fixed Rate Notes.

Changes Requiring Approval of the Holder. First, there are changes that cannot be made to the Fixed Rate Notes without specific approval of the holder. The following is a list of those types of changes:

- change the stated maturity of the principal or interest on Fixed Rate Notes of any series;
- reduce any amounts due on any Fixed Rate Notes of such series;
- reduce the amount of principal payable upon acceleration of the maturity of the Fixed Rate Notes following an Event of Default;
- change the place or currency of payment for the Fixed Rate Notes;
- impair the holder's right to sue for the enforcement of any payment on or with respect to the Fixed Rate Notes;

- reduce the percentage in principal amount of the Fixed Rate Notes, the approval of whose holders is needed to modify or amend the indenture or the Fixed Rate Notes;
- reduce the percentage in principal amount of the Fixed Rate Notes, the approval of whose holders is needed to waive compliance with certain provisions of the indenture or to waive certain defaults; and
- modify any other aspect of the provisions dealing with modification and waiver of the indenture, except to increase the percentage required for any modification or to provide that other provisions of the indenture may not be modified or waived without consent of the holder of each note of such series affected by the modification.

Changes Not Requiring Approval. The second type of change does not require any vote by holders of the Fixed Rate Notes. The following is a list of those types of changes:

- cure any ambiguity, defect or inconsistency;
- evidence the succession of another entity to the Issuer's obligations under the indenture;
- provide for uncertificated Fixed Rate Notes in addition to or in place of certificated Fixed Rate Notes;
- add to the covenants for the benefit of holders of outstanding Fixed Rate Notes or to surrender any right or power the Issuer has under the indenture;
- add additional events of default;
- secure Fixed Rate Notes of any series;
- make any change that does not adversely affect the rights of any holder of senior debt securities in any material respect;
- issue additional Fixed Rate Notes of any series;
- evidence and provide for a successor Trustee and add to or change the provisions of the indenture to provide for or facilitate the administration of the trusts under the indenture; or
- comply with requirements of the SEC in order to effect or maintain the qualification of the indenture under the Trust Indenture Act of 1939, as amended (the "Trust Indenture Act").

Changes Requiring a Majority Vote. Any other change to the indenture and the Fixed Rate Notes would require the following approval:

- If the change affects only Fixed Rate Notes of one series, it must be approved by the holders of a majority in principal amount of the Fixed Rate Notes of that series.
- If the change affects the Fixed Rate Notes as well as the senior debt securities of one or more other series issued under the indenture, it must be approved by the holders of a majority in principal amount of the Fixed Rate Notes and each other series of senior debt securities affected by the change.
- In each case, the required approval must be given by written consent.

The same vote would be required for the Issuer to obtain a waiver of a past default. However, the Issuer cannot obtain a waiver of a payment default or a waiver with respect to any other aspect of the indenture and the Fixed Rate Notes listed in the first category described previously under "Changes Requiring Approval of the Holder" unless the Issuer obtains a holder's individual consent to the waiver.

Further Details Concerning Voting

Any series of notes will not be considered outstanding, and therefore not eligible to vote, if the Issuer, or in the case of the Floating Rate Notes, Thermo Fisher or Thermo Fisher International, has deposited or set aside in trust for holders of such series of notes money for their payment or redemption. The notes of any series will also not be eligible to vote if they have been fully defeased as described above under "Full Defeasance."

The Issuer generally is entitled to set any day as a record date for the purpose of determining the holders of outstanding notes that are entitled to vote or take other action under the indenture. In certain limited circumstances, the Trustee is entitled to set a record date for action by holders. If the Issuer or the Trustee sets a record date for a vote or other action to be taken by holders of notes, that vote or action may be taken only by persons who are holders of outstanding notes on the record date and must be taken within 180 days following the record date or another period that the Issuer may specify (or as the Trustee may specify, if it set the record date). The Issuer may shorten or lengthen (but not beyond 180 days) this period from time to time.

No Personal Liability of Incorporators, Stockholders, Officers, Directors

The indentures provide that no recourse shall be had under any obligation, covenant or agreement of the Issuers in the indentures or in any of the notes or because of the creation of any indebtedness represented thereby, against any of its incorporators, stockholders, officers or directors, past, present or future, or of any predecessor or successor entity thereof under any law, statute or constitutional provision or by the enforcement of any assessment or by any legal or equitable proceeding or otherwise. Each holder, by accepting the notes, waived and released all such liability.

Concerning the Trustee

The Bank of New York Mellon Trust Company, N.A. is the trustee under the indentures. The Bank of New York Mellon, London Branch, has been appointed as paying agent with respect to the notes. The Trustee or its affiliates may from time to time in the future provide banking and other services to the Issuers in the ordinary course of their business.

The indentures provide that, prior to the occurrence of an Event of Default with respect to the notes of a series and after the curing or waiving of all such Events of Default with respect to that series, the Trustee will not be liable except for the performance of such duties as are specifically set forth in the indenture. If an Event of Default has occurred and has not been cured or waived, the Trustee will exercise such rights and powers vested in it under the applicable indenture and will use the same degree of care and skill in its exercise as a prudent person would exercise under the circumstances in the conduct of such person's own affairs.

The indentures and the provisions of the Trust Indenture Act incorporated by reference therein contain limitations on the right of the Trustee thereunder, should it become a creditor of the Issuer or any of its subsidiaries, to obtain payment of claims in certain cases or to realize on certain property received by the Trustee in respect of any such claims, as security or otherwise. The Trustee is permitted to engage in other transactions, provided that if it acquires any conflicting interest (as defined in the Trust Indenture Act), it must eliminate such conflict or resign.

Unclaimed Funds

All funds deposited with the Trustee or any paying agent for the payment of principal, interest, premium or additional amounts in respect of notes that remain unclaimed for one year after the date upon which the principal of, premium, if any, or interest on such notes shall have become due and payable will be repaid to the Issuer. Thereafter, any right of any holder of notes to such funds shall be enforceable only against the Issuer, and the Trustee and paying agents will have no liability therefor.

Book-Entry; Delivery and Form

The notes are issued in the form of one or more global notes in fully registered form, without coupons, and have been deposited with, or on behalf of, a common depository, and registered in the name of the nominee of the common depository, for, and in respect of interests held through, Euroclear Bank SA/NV ("*Euroclear*") and Clearstream Banking, S.A. ("*Clearstream*"). Except as described herein, certificates will not be issued in exchange for beneficial interests in the global notes. Except as set forth below, the global notes may be transferred, in whole and not in part, only to Euroclear or Clearstream or their respective nominees.

Beneficial interests in the global notes are represented, and transfers of such beneficial interests are effected, through accounts of financial institutions acting on behalf of beneficial owners as direct or indirect participants in Euroclear or Clearstream. Those beneficial interests must be in denominations of €100,000 and integral multiples of €1,000 in excess thereof. Investors may hold notes directly through Euroclear or Clearstream, if they are participants in such systems, or indirectly through organizations that are participants in such systems.

For so long as the notes are represented by global notes deposited with, and registered in the name of a nominee for, a common depository for Euroclear and/or Clearstream, each person (other than Euroclear or Clearstream) who is for the time being shown in the records of Euroclear or of Clearstream as the holder of a particular nominal amount

of the notes (in which regard any certificate or other document issued by Euroclear or Clearstream as to the nominal amount of the notes standing to the account of any person shall be conclusive and binding for all purposes save in the case of manifest error) shall upon their receipt of a certificate or other document be treated by Thermo Fisher and the Trustee as the holder of such nominal amount of the notes and the registered holder of the global notes shall be deemed not to be the holder for all purposes other than with respect to the payment of principal or interest on such nominal amount of the notes, for which purpose the registered holder of the relevant global note shall be treated by Thermo Fisher and the Trustee as the holder of such nominal amount of the notes in accordance with and subject to the terms of the global notes and the expressions “noteholder” and “holder of notes” and related expressions shall be construed accordingly.

Certificated Notes

If the depositary for any of the securities represented by a global security is at any time unwilling or unable to continue as depositary or ceases to be a clearing agency registered under the Exchange Act, and a successor depositary registered as a clearing agency under the Exchange Act is not appointed by us within 90 days, we will issue securities in definitive form in exchange for the global security that had been held by the depositary. Any securities issued in definitive form in exchange for a global security will be registered in the name or names that the depositary gives to the Trustee or other relevant agent of ours or theirs. It is expected that the depositary’s instructions will be based upon directions received by the depositary from participants with respect to ownership of beneficial interests in the global security that had been held by the depositary.

Governing Law

The indentures, the notes and the guarantee of the Floating Rate Notes are governed by, and construed in accordance with, the laws of the State of New York.

Effective as of 2/25/2020

SUMMARY OF ANNUAL NON-MANAGEMENT DIRECTOR COMPENSATION

I. Board Members (Other than the Lead Director)

A. Annual Cash Compensation

Annual Cash Retainer:	\$125,000
Additional Cash Retainer for Chairman of Audit Committee:	\$25,000
Additional Cash Retainer for Chairs of Compensation Committee, Nominating and Corporate Governance Committee, Science and Technology Committee and Strategy and Finance Committee:	\$15,000

B. Equity Compensation

Annual equity grants are made upon the recommendation of the Compensation Committee.

II. Lead Director

A. Annual Cash Compensation

Annual Cash Retainer:	\$165,000
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B. Equity Compensation

Annual equity grants are made upon the recommendation of the Compensation Committee.

III. Travel Expenses

Directors are reimbursed for reasonable out-of-pocket expenses incurred in attending meetings.

[Company Letterhead]

August 28, 2017

Michel Lagarde

Dear Michel:

This letter will confirm our offer to you of the position of Senior Vice President and President, Contract Development and Manufacturing of Thermo Fisher Scientific Inc. ("Thermo Fisher" or the "Company") once the acquisition of Patheon N.V. ("Patheon") by Thermo Fisher has been completed (the "Closing"). The financial terms of the offer are outlined in the attached (the "Term Sheet") and are contingent upon the Closing and will only become effective at that time. This offer is also contingent upon formal approval by the Compensation Committee of the Company's Board of Directors, which we expect to receive prior to the Closing. This letter replaces and supersedes in its entirety the letter to you from Thermo Fisher dated as of July 14, 2017.

Effective on the Closing, your employment agreement dated May 2, 2016 (the "Employment Agreement") will remain largely in effect. Acceptance of this offer may cause certain aspects to be inconsistent with specific terms in your Employment Agreement (position title and location, for example). In such instances, the terms of this letter will govern until we have an opportunity to work with you to modify your Employment Agreement.

The position offered is a Senior Executive, Band 13 position, and in this role, you will report directly to Marc Casper, President and CEO. In addition, a recommendation will be made to the Company's Board of Directors to elect you an Officer of Thermo Fisher as soon as practicable after the Closing. This position will be based in our Waltham, MA Corporate Headquarters and you will assume the role effective on the Closing.

Effective on the Closing, your annual salary will remain \$750,000 annually, payable in regular installments consistent with Company practice. Your salary will be reviewed in the first quarter of 2018 and annually thereafter, to determine your eligibility for a merit increase.

Effective on the Closing, you will also be eligible to participate in the Thermo Fisher incentive bonus plan, which provides you the opportunity to earn additional compensation based on company and individual performance. Your target amount for annual incentive compensation will continue to be 100% of your base salary, subject to plan guidelines. To be eligible for a bonus payment, you must be actively employed at the time the bonuses are paid (which is usually during March of the year following the plan year).

In addition, effective upon the Closing, you will be eligible to participate in a Synergy Bonus Plan (the "Synergy Plan") that we will develop for select Patheon senior leaders, pursuant to which

you would be eligible to earn up to \$750,000. The Synergy Plan will include individual synergy objectives with one and two year cumulative company targets that must be achieved for individual payouts to be earned. Up to 50% of your individual target opportunity will be earned based on achievement of synergy objectives in calendar year 2018, and up to 50% of your individual target will be earned based on achievement of synergy objectives in calendar 2019. Additional information on the plan design and individual and company targets will be provided to you as we work with you on integration planning.

Your Patheon time-based RSUs and time-based Options that are unvested at Closing will be exchanged for grants of Thermo Fisher stock based on the terms and conditions contained in the purchase agreement between Thermo Fisher and Patheon (the "Purchase Agreement").

The performance goals associated with your 2016 performance-based stock option grant will be deemed to have been achieved in full as of Closing, and will be exchanged for Thermo Fisher stock options based on the terms and conditions contained in the Purchase Agreement, except with respect to the vesting schedule of such stock options. One-half of the resulting stock option grant will vest and become exercisable at the time of exchange, and one-half will vest and become exercisable on the third anniversary of the Closing.

All unvested RSUs and options received as part of these exchanges will be accelerated and vested in full if, prior to the normal vesting, you terminate employment for Good Reason (consistent with the terms outlined in your Employment Agreement, and subject to our mutual agreement that the assumption of the offered position will not constitute Good Reason), death or disability, or if you are involuntarily terminated without Cause (as defined in your Employment Agreement).

A recommendation will be made to the appropriate committee of the Company's Board of Directors to approve the issuance to you of an equity award with a calculated value of \$2,500,000. The recommendation will consist of 50% stock options and 50% time-based restricted stock units ("TRSUs"). The stock options will be granted at a price that approximates market value on the date of grant. This recommendation will be submitted for approval as soon as practicable following the Closing. The grants will be effective on the date of approval.

The options are 7 year options, vesting ratably over a four year period, with 25% vesting on each of the first through fourth anniversaries of the grant date. Vested options are exercisable at any time during the remainder of their seven year term.

The TRSUs vest over a 3 1/2 year period, with 15% vesting six months following the grant date, and 25%, 30% and 30% vesting 18 months, 30 months, and 42 months following the grant date, respectively. The underlying shares will be delivered to you shortly after vesting (less applicable withholding taxes).

The options and TRSUs are subject to the terms and conditions of the applicable agreements and equity plan documents, which will be provided to you subsequent to the approval of the grants. You must be actively employed at the time of vesting for the options to be exercisable and for the TRSUs to be distributed.

Effective on the Closing, you will be eligible for additional long-term incentive grants annually, beginning with the 2018 cycle. Your targeted level of long-term incentives for 2018 will be a minimum of \$1,000,000, and for 2019 will be \$2,500,000. Your actual 2019 grant may be

adjusted, up or down, based on a combination of company and business unit performance, and your individual contributions in your role.

Upon integration, your participation in the benefit programs offered by Patheon will end on the date you are covered under the Company's similar standard benefit plans, with no gap in coverage for you or your dependent family members following the Closing. Your current benefit and executive perquisite offerings will be unchanged for at least one year, subject to local legal and governance requirements. Following integration, your benefits will be at least equal to all other Thermo Fisher executives in similar roles.

As an executive at Thermo Fisher, following integration, you will also be eligible for additional Company-paid life insurance and you will have the option to defer a portion of your compensation (salary and bonus) into the Company's deferred compensation plan, which provides a 100% match on the first 6% of compensation deferred into the plan, subject to plan rules and restrictions. In addition, you may also be eligible for the Company-paid executive long-term disability ("LTD") benefit, which can provide up to an additional \$10,000 of monthly LTD benefit.

As a Band 13 Officer of Thermo Fisher, you will also be eligible effective upon the Closing to the benefits provided under the Company's standard Executive Severance Policy, as amended ("TMO Severance Policy") and standard Executive Change in Control Retention Agreement ("TMO CIC Agreement"). Your severance and change-in-control benefits will be at least equal to all other Thermo Fisher executives in similar roles.

In brief, under the TMO Severance Policy, you would be entitled to, among other benefits, severance pay equal to 1.5 times your base annual salary and target bonus at the time if your employment is terminated without "cause" (as defined in the policy). Your eligibility to receive severance benefits under the TMO Severance Policy is contingent upon your signing the Company's Noncompetition Agreement at the time of the Closing.

Under the TMO CIC Agreement, you would be entitled to, among other benefits, severance pay equal to two times your base annual salary and target bonus at the time if your employment is terminated without "cause" or you terminate your employment with "good reason" within 18 months of a "change in control" of Thermo Fisher (as these terms are defined in the agreement).

During the period between the Closing and May 1, 2018, you will be eligible to receive severance benefits as described in your Employment Agreement and you will not be eligible for benefits under the TMO Severance Policy, which will begin on May 2, 2018, at which time your eligibility for the severance benefits under your Employment Agreement will cease. Your eligibility for benefits under the TMO CIC Agreement will begin upon the Closing.

Copies of the TMO Severance Policy, the TMO CIC Agreement, and the Noncompetition Agreement will be provided to you under separate cover.

We both acknowledge and agree that upon the effective date of the Closing, you will cease to be President of Patheon, and your acceptance of your new position may not be used by you in the future as the basis for your claiming "Good Reason" as that term is defined in your Employment Agreement. However, notwithstanding the waiver contained in the preceding sentence, we further agree that you have not waived your right to claim "Good Reason" if subsequent to the Closing and within 12 months following the Closing, the Company changes

your new position or its duties or responsibilities, base salary or location in such a way that one or more of the conditions required to allow you to claim "Good Reason" would exist.

Thermo Fisher, as a government contractor, is required to maintain a drug free workplace. Therefore, this employment offer is conditional upon your passing a pre-employment drug test and a background investigation. In the event that the background investigation reveals information that, in the Company's discretion, raises material concerns about your qualifications for the position, we will contact you to discuss our concerns, which if not resolved to our satisfaction, could result in a revocation of this offer or a termination of your employment.

In accordance with the Company's standard employment practice, you will also be required to sign the Company's Information and Invention Agreement, a copy of which will be provided to you.

Michel, our employees are committed to the success and growth of our business. At Thermo Fisher, we believe that our core values of Integrity, Intensity, Innovation and Involvement are the key to this success. We are very enthusiastic about the prospect of you joining our team and your commitment to our values. We are confident that your skills and experience will enable Thermo Fisher Scientific to maintain its premier position as the world leader in serving science.

You may accept our offer of employment by signing and returning this letter to Martin Van Walsum, Vice President, Executive Compensation at martin.vanwalsum@thermofisher.com.

Sincerely,

Marc Casper
President & CEO

Accepted and Agreed:

By: /s/ Michel Lagarde 8-28-17
Michel Lagarde Date

cc: Martin Van Walsum

**OPTION AGREEMENT
UNDER THE PATHEON N.V.
2016 OMNIBUS INCENTIVE PLAN**

This Award Agreement (this "Option Award Agreement"), dated as of July 20, 2016 (the "Date of Grant"), is made by and between Patheon N.V., a Dutch public limited company (the "Company"), and Mr. Michel Lagarde (the "Participant"). Capitalized terms not defined herein shall have the meaning ascribed to them in the Patheon N.V. 2016 Omnibus Incentive Plan (the "Plan"). Where the context permits, references to the Company shall include any successor to the Company.

1. Grant of Option. The Company hereby grants to the Participant an option (the "Option") to purchase 714,286 Common Shares at an exercise price per share of \$21.00 (the "Exercise Price"), subject to all of the terms and conditions of this Option Award Agreement and the Plan.

2. Vesting and Option Term. Subject to Section 4 of this Option Award Agreement, the Option shall vest upon achievement of the following Consolidated EBITDA targets for any twelve (12) month period concluding prior to the seventh (7) anniversary of the Date of Grant:

(i) 1/3rd of the Common Shares subject to the Option shall vest upon the achievement of Consolidated EBITDA of \$700 million.

(ii) 1/3rd of the Common Shares subject to the Option shall vest upon the achievement of Consolidated EBITDA of \$850 million.

(iii) 1/3rd of the Common Shares subject to the Option shall vest upon the achievement of Consolidated EBITDA of \$1,000 million.

Consolidated EBITDA shall be calculated as soon as practicable following the end of each calendar month (each such date, a "Determination Date") and the Participant shall vest in the resulting portion of the Option (if any) subject to the Participant's continued service through the applicable Determination Date. "Consolidated EBITDA" shall have the meaning assigned to such term in that certain Credit Agreement, dated March 11, 2014, by and among the Company, UBS AG, Stamford Branch and the lenders from time to time party thereto, as amended on each of September 29, 2014 and March 31, 2015, (the "Credit Agreement") as in effect upon the Date of Grant. All determinations made by the Administrator related to the calculation of Consolidated EBITDA shall be final and binding on the Participant.

The Option shall become exercisable with respect to the number of Common Shares subject to the vested portion of the Option. The Option, or any portion thereof, that is unvested on the seventh (7) anniversary of the Date of Grant shall terminate without consideration. The term of the Option and of this Option Award Agreement (the "Option Term") shall commence on the Date of Grant set forth above and, unless previously terminated pursuant to the immediately preceding sentence or Section 4 of this Option Award Agreement, shall terminate upon the tenth anniversary of the Date of Grant (the "Expiration Date"). Once exercisable, the Option shall continue to be exercisable at any time or times prior to the Expiration Date, subject to the provisions hereof and of the Plan. As of the Expiration Date, all rights of the Participant hereunder shall terminate without consideration.

3. Restrictions. The Option may not be sold, assigned, transferred, pledged, hypothecated or otherwise disposed of or encumbered and shall be subject to a risk of forfeiture until any requirements or restrictions contained in this Option Award Agreement or the Plan have been otherwise satisfied, terminated or expressly waived by the Company in writing. This Option Award Agreement shall not be assignable by the Participant.

4. Termination of Employment. Subject to Section 14 of the Plan and except as otherwise explicitly set forth in a written individual agreement entered into by the Participant and the Company or any of its Subsidiaries, the following provisions shall apply:

(a) Termination of Employment for Cause. Upon the termination of the Participant's employment with the Company and all Affiliates thereof by the Company for Cause, this Option Award Agreement shall terminate, all rights of the Participant with respect to the Option (whether or not exercisable) shall immediately terminate, and neither the Participant nor any of the Participant's successors, heirs, assigns, or personal representatives shall thereafter have any further rights or interests in such Option.

(b) Qualifying Termination of Employment. Upon termination of the Participant's employment with the Company and all Affiliates thereof (i) on account of death, (ii) due to Disability, (iii) by the Company without Cause or (iv) by the Participant for Good Reason, the Participant shall vest in the next tranche of the Option if the Consolidated EBITDA target related to such tranche is determined to be achieved on a Determination Date that occurs within the six month period following such termination of employment. After giving effect to the foregoing, (A) the Option shall terminate to the extent not vested (or eligible to become vested) on the date of such termination of employment and (B) the portion of the Option that is vested as of the date of the Participant's termination of employment, or becomes vested pursuant to this Section 4(b), shall remain exercisable for a period of one (1) year from and including the date of termination of the Participant's employment and thereafter such vested portion of the Option, if not exercised, shall terminate. For the avoidance of doubt, if the applicable Consolidated EBITDA target is not achieved, the portion of the Option eligible to vest pursuant to this Section 4(b) shall terminate six months following the Participant's termination of employment.

(c) Termination of Employment for any Other Reason. Upon the Participant's termination of employment with the Company and all Affiliates thereof for any reason other than the reasons enumerated in subsections (a) or (b) above, the portion of the Option that is exercisable as of the date of such termination of employment shall remain exercisable for a period of ninety (90) days (and shall terminate thereafter). Subject to Section 4(b), all additional portions of the Option which are not exercisable as of the date of such termination of employment shall terminate upon the date of such termination of employment.

5. Option Award Agreement Subject to Plan. This Option Award Agreement is made pursuant to all of the provisions of the Plan, which is incorporated herein by this reference, and is intended, and shall be interpreted in a manner, to comply therewith. In the event of any conflict between the provisions of this Option Award Agreement and the provisions of the Plan, the provisions of the Plan shall govern. For the avoidance of doubt, the treatment of this Option following a Change in Control shall be governed by Section 14 of the Plan

6. No Rights to Continuation of Employment. Nothing in the Plan or this Option Award Agreement shall confer upon the Participant any right to continue in the employ of the Company or any Affiliate thereof or shall interfere with or restrict the right of the Company or its Affiliates to terminate the Participant's employment at any time for any reason whatsoever, with or without Cause.

7. Tax Withholding. The Participant is responsible for all taxes, including any federal, state, or local taxes, social security contributions and national insurance premiums due in respect of the Option and the issuance of Common Shares thereof. The Company or a Subsidiary shall be entitled to deduct from the Common Shares otherwise issuable hereunder or other compensation payable to the Participant any sums required by federal, state, local or foreign tax law to be withheld or to satisfy any applicable payroll deductions with respect to the Option. Subject to applicable law, the Company or a Subsidiary shall withhold from Common Shares otherwise issuable upon exercise of the Option, a portion of those Common Shares with an aggregate Fair Market Value (defined as in the Plan but measured as of the date of exercise) equal to the amount of the applicable withholding taxes, contributions and/or premiums; provided, however, that the number of such Common Shares so withheld shall not exceed the amount necessary to satisfy the Company's or the Subsidiary's required tax withholding obligations using the minimum statutory withholding tax rates (or such other amount as may be permitted by applicable law and accounting standards); provided, further, that, subject to applicable law, the Participant may elect to remit to the Company, or the relevant Subsidiary, an amount in cash sufficient to satisfy the applicable withholding taxes, contributions and/or premiums and receive the number of Common Shares issuable hereunder, provided the Company, or the relevant Subsidiary, is notified of the Participant's intention to remit cash prior to the date the Option is subject to taxation.

8. Section 409A Compliance. The intent of the parties is that the payments under this Option Award Agreement are exempt from, or to the extent subject thereto, comply with, Section 409A of the Code, and, accordingly, to the maximum extent permitted, this Option Award Agreement shall be interpreted and administered in accordance therewith. Notwithstanding anything contained herein to the contrary, to the extent required in order to avoid accelerated taxation and/or tax penalties under Section 409A of the Code, the Participant shall not be considered to have terminated employment with the Company and its Affiliates for purposes of this Option Award Agreement until the Participant would be considered to have incurred a "separation from service" within the meaning of Section 409A of the Code. Any payments described in this Option Award Agreement that are due within the "short-term deferral period" as defined in Section 409A of the Code shall not be treated as deferred compensation unless applicable law requires otherwise. Notwithstanding anything to the contrary in this Option Award Agreement, to the extent that any payment (including Common Share delivery) is to be made upon a separation from service and such payment would result in the imposition of any individual penalty tax and late interest charges imposed under Section 409A of the Code, such payment shall instead be made on the first business day after the date that is six (6) months following such separation from service (or upon the Participant's death, if earlier).

9. Governing Law. This Option Award Agreement shall be governed by, interpreted under, and construed and enforced in accordance with the internal laws, and not the laws pertaining to conflicts or choices of laws, of the State of New York applicable to agreements made and to be performed wholly within the State of New York.

10. Option Award Agreement Binding on Successors. The terms of this Option Award Agreement shall be binding upon the Participant and upon the Participant's heirs, executors, administrators, personal representatives, transferees, assignees and successors in interest, and upon the Company and its successors and assignees, subject to the terms of the Plan.

11. Necessary Acts. The Participant hereby agrees to perform all acts, and to execute and deliver any documents that may be reasonably necessary to carry out the provisions of this Option Award Agreement, including but not limited to all acts and documents related to compliance with federal, state or foreign securities and/or tax laws.

12. Severability. Should any provision of this Option Award Agreement be held by a court of competent jurisdiction to be unenforceable, or enforceable only if modified, such holding shall not affect the validity of the remainder of this Option Award Agreement, the balance of which shall continue to be binding upon the parties hereto with any such modification (if any) to become a part hereof and treated as though contained in this original Option Award Agreement. Moreover, if one or more of the provisions contained in this Option Award Agreement shall for any reason be held to be excessively broad as to scope, activity, subject or otherwise so as to be unenforceable, in lieu of severing such unenforceable provision, such provision or provisions shall be construed by the appropriate judicial body by limiting or reducing it or them, so as to be enforceable to the maximum extent compatible with the applicable law as it shall then appear, and such determination by such judicial body shall not affect the enforceability of such provisions or provisions in any other jurisdiction.

13. Entire Option Award Agreement. Except as set forth in Section 4 hereof, this Option Award Agreement and the Plan contain the entire agreement and understanding among the parties as to the subject matter hereof, and supersedes any other agreements or representations, oral or otherwise, express or implied, with respect to the subject matter hereof.

14. Headings. Headings are used solely for the convenience of the parties and shall not be deemed to be a limitation upon or descriptive of the contents of any such Section.

15. Counterparts; Electronic Signature. This Option Award Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original and all of which together shall be deemed to be one and the same instrument. The Participant's electronic signature of this Option Award Agreement shall have the same validity and effect as a signature affixed by the Participant's hand.

16. Amendment. No amendment or modification hereof shall be valid unless it shall be in writing and signed by all parties hereto. Notwithstanding the foregoing, the Administrator shall have the authority to make equitable adjustments to the calculation of Consolidated EBITDA in recognition of unusual or non-recurring events affecting the Company or any Affiliate thereof or the financial statements of the Company or any Affiliate thereof, in response to changes in applicable laws or regulations, or to account for items of gain, loss or expense determined to be extraordinary or unusual in nature or infrequent in occurrence or related to the disposal of a segment of a business or related to a change in accounting principles.

17. Data Protection. The Participant hereby acknowledges and consents to the Company and any Subsidiary sharing and exchanging his/her information held in order to administer and operate the Plan (including personal details, data relating to participation, salary, taxation and employment and sensitive

personal data, e.g. data relating to physical or mental health, criminal conviction or the alleged commission of offences) (the "Information") and providing the Company and/or the Subsidiary's agents and/or third parties with the Information for the administration and operation of the Plan and the Participant further accepts that this may involve the Information being sent to a country outside the country in which the Participant provides services including to a country which may not have the same level of data protection laws as his/her home country. The Participant acknowledges that s/he has the right to request a list of the names and addresses of any potential recipients of the Information and to review and correct the Information by contacting his/her local human resources representative. The Participant acknowledges that the collection, processing and transfer of the Information is important to Plan administration and that failure to consent to same may prohibit participation in the Plan.

18. Additional Matters. This Option Award Agreement is intended to comply with the applicable laws of any country or jurisdiction where the Option is granted under the Plan, and all provisions hereof shall be construed in a manner to so comply.

IN WITNESS WHEREOF, the parties hereto have executed this Option Award Agreement as of the date set forth above.

PATHEON N.V.

By /s/ Jim Mullen

Print Name: Jim Mullen

Title: Chief Executive Officer

The undersigned hereby accepts and agrees to all the terms and provisions of the Plan and foregoing Option Award Agreement.

Michel Lagarde

PARTICIPANT

Signature: /s/ Michel Lagarde

Michel Lagarde

**RESTRICTED SHARE UNIT AWARD AGREEMENT
UNDER THE PATHEON N.V.
2016 OMNIBUS INCENTIVE PLAN**

This Award Agreement (this "RSU Award Agreement"), dated as of March 23, 2017 (the "Date of Grant"), is made by and between Patheon N.V., a Dutch public limited company (the "Company"), and Michel Lagarde (the "Participant"). Capitalized terms not defined herein shall have the meaning ascribed to them in the Patheon N.V. 2016 Omnibus Incentive Plan (the "Plan"). Where the context permits, references to the Company shall include any successor to the Company.

1. Grant of Restricted Share Units. The Company hereby grants to the Participant 42,469 restricted share units (the "RSUs"), subject to all of the terms and conditions of this RSU Award Agreement and the Plan.

2. Vesting and Form of Payment. Subject to Section 4 of this RSU Award Agreement, the RSUs shall vest ratably over the first, second and third anniversaries of the Date of Grant. Each RSU granted hereunder shall represent the right to receive one (1) Common Share, which shall be issuable on or as soon as administratively practical following each date of vesting of the applicable portion of the total RSUs pursuant to the terms hereof (and in all events within sixty (60) days after the applicable vesting event); provided, that such issuance is otherwise in accordance with federal and state securities laws.

3. Restrictions. The RSUs may not be sold, assigned, transferred, pledged, hypothecated or otherwise disposed of or encumbered and shall be subject to a risk of forfeiture until any requirements or restrictions contained in this RSU Award Agreement or the Plan have been otherwise satisfied, terminated or expressly waived by the Company in writing. This RSU Award Agreement shall not be assignable by the Participant.

4. Termination of Employment. Except as otherwise explicitly set forth in a written individual agreement entered into between the Participant and the Company or any of its Subsidiaries, the following provisions shall apply:

(a) Termination of Employment for Cause. Upon the termination of the Participant's employment with the Company and all Affiliates thereof by the Company for Cause, this RSU Award Agreement shall terminate and all rights of the Participant with respect to RSUs (whether vested or unvested) shall immediately terminate. The RSUs shall be forfeited without payment of any consideration, and neither the Participant nor any of the Participant's successors, heirs, assigns, or personal representatives shall thereafter have any further rights or interests in such RSUs.

(b) Qualifying Termination of Employment. Upon termination of the Participant's employment with the Company and all Affiliates thereof (i) on account of death, (ii) due to Disability, (iii) by the Company without Cause or (iv) by the Participant for Good Reason, the Participant shall vest in the next tranche of unvested RSUs on a pro rata basis. The prorated portion shall be calculated based on the number of full months in the applicable one-year vesting period during which the Participant was employed by the Company as compared to twelve months. Any portion of the RSUs that does not vest in accordance with the foregoing shall automatically be forfeited on the date of such termination of employment.

(c) Termination of Employment for any Other Reason. If the Participant has a termination of employment with the Company and all Affiliates thereof for any reason other than the reasons enumerated in Subparagraphs (a) or (b) above, RSUs that are unvested as of date of termination shall be forfeited upon such date.

5. Voting and Other Rights. The Participant shall have no rights of a shareholder until Common Shares are issued upon settlement of the Participant's RSUs. Notwithstanding the foregoing, the bookkeeping account maintained for the RSUs granted pursuant to this RSU Award Agreement shall be allocated additional RSUs on the payment date of any dividends on the Common Shares. Such dividends will be converted into additional Common Shares covered by the RSUs by dividing (i) the aggregate amount or value of the dividends paid with respect to that number of Common Shares equal to the number of shares covered by the RSUs by (ii) the Fair Market Value per Common Share on the payment date for such dividend. Any such additional RSUs shall vest in accordance with the same terms as the RSUs granted under this RSU Award Agreement. No interest or other earnings will be credited with respect to such payment.

6. RSU Award Agreement Subject to Plan. This RSU Award Agreement is made pursuant to all of the provisions of the Plan, which is incorporated herein by this reference, and is intended, and shall be interpreted in a manner, to comply therewith. In the event of any conflict between the provisions of this RSU Award Agreement and the provisions of the Plan, the provisions of the Plan shall govern.

7. No Rights to Continuation of Employment. Nothing in the Plan or this RSU Award Agreement shall confer upon the Participant any right to continue in the employ of the Company or any Affiliate thereof or shall interfere with or restrict the right of the Company or its Affiliates to terminate the Participant's employment at any time for any reason whatsoever, with or without Cause.

8. Tax Withholding. The Participant is responsible for all taxes, including any federal, state, or local taxes, social security contributions and national insurance premiums due upon the grant or vesting of the RSUs and the issuance of Common Shares in respect of the RSUs. The Company or a Subsidiary shall be entitled to deduct from the Common Shares otherwise issuable hereunder or other compensation payable to the Participant any sums required by federal, state, local or foreign tax law to be withheld or to satisfy any applicable payroll deductions with respect to the grant, settlement or payment of any RSU. Subject to applicable law, the Company or a Subsidiary shall withhold, from Common Shares otherwise issuable upon settlement of the RSUs, a portion of those Common Shares with an aggregate Fair Market Value (defined as in the Plan but measured as of the date of settlement) equal to the amount of the applicable withholding taxes, contributions and/or premiums; provided, however, that the number of such Common Shares so withheld shall not exceed the amount necessary to satisfy the Company's or the Subsidiary's required tax withholding obligations using the minimum statutory withholding tax rates (or such other amount as may be permitted by applicable law and accounting standards); provided, further, that, subject to applicable law, the Participant may elect to remit to the Company, or the relevant Subsidiary, an amount in cash sufficient to satisfy the applicable withholding taxes, contributions and/or premiums and receive the number of Common Shares issuable hereunder, provided the Company, or the relevant Subsidiary, is notified of the Participant's intention to remit cash prior to the date the RSUs are subject to taxation.

9. Section 409A Compliance. The intent of the parties is that the payments under this RSU Award Agreement are exempt from, or to the extent subject thereto, comply with, Section 409A of the Code, and, accordingly, to the maximum extent permitted, this RSU Award Agreement shall be interpreted and administered in accordance therewith. Notwithstanding anything contained herein to the contrary, to the extent required in order to avoid accelerated taxation and/or tax penalties under Section 409A of the Code, the Participant shall not be considered to have terminated employment with the Company and its Affiliates for purposes of this RSU Award Agreement until the Participant would be considered to have incurred a "separation from service" within the meaning of Section 409A of the Code. Any payments described in this RSU Award Agreement that are due within the "short-term deferral period" as defined in Section 409A of the Code shall not be treated as deferred compensation unless applicable law requires otherwise. Notwithstanding anything to the contrary in this RSU Award Agreement, to the extent that any payment (including Common Share delivery) is to be made upon a separation from service and such payment would result in the imposition of any individual penalty tax and late interest charges imposed under Section 409A of the Code, such payment shall instead be made on the first business day after the date that is six (6) months following such separation from service (or upon the Participant's death, if earlier).

10. Governing Law. This RSU Award Agreement shall be governed by, interpreted under, and construed and enforced in accordance with the internal laws, and not the laws pertaining to conflicts or choices of laws, of the State of New York applicable to agreements made and to be performed wholly within the State of New York.

11. RSU Award Agreement Binding on Successors. The terms of this RSU Award Agreement shall be binding upon the Participant and upon the Participant's heirs, executors, administrators, personal representatives, transferees, assignees and successors in interest, and upon the Company and its successors and assignees, subject to the terms of the Plan.

12. Necessary Acts. The Participant hereby agrees to perform all acts, and to execute and deliver any documents that may be reasonably necessary to carry out the provisions of this RSU Award Agreement, including but not limited to all acts and documents related to compliance with federal, state or foreign securities and/or tax laws.

13. Severability. Should any provision of this RSU Award Agreement be held by a court of competent jurisdiction to be unenforceable, or enforceable only if modified, such holding shall not affect the validity of the remainder of this RSU Award Agreement, the balance of which shall continue to be binding upon the parties hereto with any such modification (if any) to become a part hereof and treated as though contained in this original RSU Award Agreement. Moreover, if one or more of the provisions contained in this RSU Award Agreement shall for any reason be held to be excessively broad as to scope, activity, subject or otherwise so as to be unenforceable, in lieu of severing such unenforceable provision, such provision or provisions shall be construed by the appropriate judicial body by limiting or reducing it or them, so as to be enforceable to the maximum extent compatible with the applicable law as it shall then appear, and such determination by such judicial body shall not affect the enforceability of such provisions or provisions in any other jurisdiction.

14. Entire RSU Award Agreement. Except as set forth in Section 4 hereof, this RSU Award Agreement and the Plan contain the entire agreement and understanding among the parties as to the

subject matter hereof, and supersedes any other agreements or representations, oral or otherwise, express or implied, with respect to the subject matter hereof.

15. Headings. Headings are used solely for the convenience of the parties and shall not be deemed to be a limitation upon or descriptive of the contents of any such Section.

16. Counterparts; Electronic Signature. This RSU Award Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original and all of which together shall be deemed to be one and the same instrument. The Participant's electronic signature of this RSU Award Agreement shall have the same validity and effect as a signature affixed by the Participant's hand.

17. Amendment. No amendment or modification hereof shall be valid unless it shall be in writing and signed by all parties hereto.

18. Data Protection. The Participant hereby acknowledges and consents to the Company and any Subsidiary sharing and exchanging his/her information held in order to administer and operate the Plan (including personal details, data relating to participation, salary, taxation and employment and sensitive personal data, e.g. data relating to physical or mental health, criminal conviction or the alleged commission of offences) (the "Information") and providing the Company and/or the Subsidiary's agents and/or third parties with the Information for the administration and operation of the Plan and the Participant further accepts that this may involve the Information being sent to a country outside the country in which the Participant provides services including to a country which may not have the same level of data protection laws as his/her home country. The Participant acknowledges that s/he has the right to request a list of the names and addresses of any potential recipients of the Information and to review and correct the Information by contacting his/her local human resources representative. The Participant acknowledges that the collection, processing and transfer of the Information is important to Plan administration and that failure to consent to same may prohibit participation in the Plan.

19. Additional Matters. This RSU Award Agreement is intended to comply with the applicable laws of any country or jurisdiction where the RSUs are granted under the Plan, and all provisions hereof shall be construed in a manner to so comply. The following provisions shall apply to the Participant, as appropriate:

Australia:

Section 8 shall be amended to add the following language at the end thereof:

This scheme is a scheme to which Subdivision 83A-C of the Income Tax Assessment Act 1997 applies (subject to the conditions in the Income Tax Assessment Act 1997).

Section 18 shall be deleted in its entirety and replaced with the following language:

Data Protection. The Participant hereby acknowledges and consents to the Company and any Subsidiary sharing and exchanging his/her information held in order to administer and operate the Plan (including personal details, data relating to participation, salary, taxation and employment and sensitive personal data, e.g. data relating to physical or mental health,

criminal conviction or the alleged commission of offenses) (the "Information") and providing the Company and/or the Subsidiary's agents and/or third parties with the Information for the administration and operation of the Plan. The Participant further accepts that this may involve the Information being sent to a country outside Australia, including to a country which may not have the same level of data protection laws as Australia, and by consenting to this disclosure the Participant acknowledges that the Company and Subsidiaries may not take steps to ensure that the overseas recipient complies with the Australian Privacy Principles. The Participant acknowledges that s/he has the right to request a list of the names and addresses of any potential recipients of the Information, to review and correct the Information, and to raise any concerns about the handling of the Information, by contacting his/her local human resources representative. The Participant acknowledges that the collection, processing and transfer of the Information is important to Plan administration and that failure to consent to same may prohibit participation in the Plan.

Austria:

Section 18 shall be deleted in its entirety and replaced with the following language:

Consent Regarding Use of Personal Data. The Participant hereby acknowledges and consents that the following information required in order to administer and operate the Plan may be processed and shared with the Company, its principal office located at 4815 Emperor Blvd, Suite 300 Durham, NC 27703-8470 and [Participant's name and address]: name, date of birth, address, employee ID, tax number, length of service with the company, award program in which the Participant participates, amount of salary (the "Information"). The Participant will provide the Company and/or the Subsidiary's agents and/or third parties with the Information for the administration and operation of the Plan as requested from time to time. The Participant further acknowledges and consents that, in order to administer and operate the Plan, the Information may be sent to UBS Equity Plan Advisory Services 1000 Harbor Blvd. Weehawken, NJ 07086 and the Participant acknowledges that these recipients are located in countries which may not have the same level of data protection laws as Austria. The Participant acknowledges that s/he has the right to request a list of the names and addresses of any potential recipients of the Information and to review and correct the Information by contacting his/her local human resources representative. The Participant may withdraw his or her consent according to this Consent at any time. The Participant acknowledges that the collection, processing and transfer of the Information is important to Plan administration and that failure to consent to same (or withdraw the consent) may prohibit participation in the Plan.

Denmark:

Section 4(b) shall be deleted in its entirety and replaced with the following language:

Qualifying Termination of Employment. Upon termination of the Participant's employment with the Company and all Affiliates thereof (i) on account of death, (ii) by the Company without Cause or (iii) by the Participant for Good Reason, the Participant's RSU shall continue to vest as though the Participant was still an employee of the Company.

France:

Section 1 shall be amended to add the following language at the end thereof:

The RSUs shall be deemed granted under and subject to the terms of the French Sub Plan For The Grant Of French-Qualifying Restricted Stock Units To Employees And Officers In France (Exhibit A of the Plan).

Section 5 shall be deleted in its entirety and replaced with the following language:

Voting and Other Rights. The Participant shall have no rights of a shareholder until Common Shares are issued upon settlement of the Participant's RSUs.

Section 18 shall be deleted in its entirety and replaced with the following language:

Data Protection: The Participant hereby acknowledges and consents to the Company and any Subsidiary collecting, processing, storing, sharing and exchanging his/her information (including personal details, data relating to participation, salary, taxation and employment and sensitive personal data, e.g., data relating to physical or mental health, criminal conviction or the alleged commission of offences) (the "Information"), and providing the Company and/or the Subsidiary's agents and/or third parties with the Information, for the sole purpose of the administration and operation of the Plan. The Participant explicitly acknowledges and accepts that the Information may be sent to a country outside of the European Economic Area (such as the United States), whose regulatory provisions in respect of the protection of personal data may differ from those in force in France. The Participant understands that Information will be held only as long as is necessary to implement, administer and manage his /her participation in the Plan. The Participant understands that s/he may, at any time, view Information, request additional information about the storage and processing of Information, obtain the correction, deletion or blocking of Information if it is incomplete or inaccurate, object to the processing of Information on compelling legitimate grounds relating to his/her personal situation or refuse or withdraw the consents herein, in any case without cost, by contacting in writing his/her local human resources representative. The Participant acknowledges that s/he has the right to request a list of the names and addresses of any potential recipients of the Information. The Participant acknowledges that the collection, processing and transfer of the Information is important to Plan administration and that failure to consent to same may prohibit participation in the Plan.

The following shall be added as Section 20:

French Language Provision. The Participant declares that he/she has a sufficient level of English to understand all the contents of this RSU Award Agreement, does not request a translation of this document into his/her mother tongue and accepts that all other texts or documents relating to this RSU Award Agreement will be drawn up in English, save where such documents impose obligations (such as the achievement of objectives) on the Participant in which case such documents will be translated into French.

French translation: *Le Participant déclare avoir un niveau d'anglais suffisant pour comprendre l'intégralité du contenu de ce contrat d'attribution d'actions ne demande pas de traduction de ce document dans sa langue maternelle et accepte que tout autre acte ou*

document relatif à ce contrat d'attribution d'actions soit rédigé en anglais, sauf si celui-ci fixe des obligations (telles que la réalisation d'objectifs) pour le Participant auquel cas ces documents seront traduits en français.

Germany:

Section 7 shall be amended to add the following language:

The Participant acknowledges that the Company is exclusively liable for the grant of RSUs pursuant to this RSU Award Agreement and, with respect to any Participant who is a party to an employment agreement with a German Affiliate, such German Affiliate shall not bear any liability relating to this RSU Award Agreement. Tax withholding obligations shall include any obligations to withhold payments on account of social security contributions and national insurance premiums.

Section 8 shall be amended to add the following language at the end thereof:

As used in this Section 8, "Subsidiary" shall include any Subsidiary subject to German withholding tax, social security contributions ("Sozialversicherungsbeiträge") and national insurance premiums.

Section 18 shall be deleted in its entirety. The Data Protection language on the Signature Page for the RSU Award Agreement granted to German Participants shall apply to all German Participants.

Italy:

Section 18 shall be deleted in its entirety and replaced with the following language:

Data Protection: The Participant hereby acknowledges and consents to the Company and any Subsidiary collecting, processing, storing, sharing and exchanging his/her information (including personal details, data relating to participation, salary, taxation and employment and sensitive personal data, e.g., data relating to physical or mental health, criminal conviction or the alleged commission of offences) (the "Information"), and providing the Company and/or the Subsidiary's agents and/or third parties with the Information, for the sole purpose of the administration and operation of the Plan. The Participant explicitly acknowledges and accepts that the Information may be sent to a country outside of the European Economic Area (such as the United States), whose regulatory provisions in respect of the protection of personal data may differ from those in force in Italy. The Participant understands that Information will be held only as long as is necessary to implement, administer and manage his /her participation in the Plan. The Participant understands that s/he may, at any time, view Information, request additional information about the storage and processing of Information, obtain the correction, deletion or blocking of Information if it is incomplete or inaccurate, object to the processing of Information on compelling legitimate grounds relating to his/her personal situation or refuse or withdraw the consents herein, in any case without cost, by contacting in writing his/her local human resources representative. The Participant acknowledges that s/he has the right to request a list of the names and addresses of any potential recipients of the Information. The Participant acknowledges that the collection, processing and transfer of the Information is important to Plan administration and that failure to consent to same may prohibit participation in the Plan. The Company shall be responsible

for determining the purposes and methods of transferring and processing the Information, and ensuring security measures are in place.

Japan:

Section 7 shall be amended to add the following language at the end thereof:

This RSU Award Agreement shall not become part of the Participant's salary or compensation, nor an acquired right, since it is not intended to compensate the Participant for the Participant's services to the Participant's employer but to be part of a global employee incentive plan implemented by the Company.

People's Republic of China:

Section 6 shall be deleted in its entirety and replaced with the following language:

No Rights to Continuation of Employment. This RSU Award Agreement and the Plan are separate from and do not form a part of the employment contract between the Participant and the Company or any Subsidiary. None of the benefits provided under the Plan shall become part of the Participant's salary or remuneration when calculating social insurance contributions or economic compensation which may be payable upon termination of the Participant's employment contract with the Company or any Subsidiary.

United Kingdom:

Section 6 shall be amended to add the following language at the end thereof:

This RSU Award Agreement and the Plan are separate from and do not form a part of any contract of employment or any other agreement between the Participant and the Company or any Subsidiary. If the Participant ceases to be employed or engaged by the Company or any Subsidiary for any reason (including as a result of a repudiatory breach of contract by any member of the Group) the Participant shall not be entitled (and by participating in the Plan shall be deemed irrevocably to have waived any entitlement, by way of compensation for loss of employment, breach of contract or otherwise) to any sum or other benefit to compensate the Participant for any rights or prospective rights under the Plan. This exclusion applies equally (and without limitation) to any loss arising from the way in which the discretion is (or is not) exercised under any Section of the Plan even if the exercise (or non-exercise) of such discretion is, or appears to be, irrational or perverse and/or breaches, or is claimed to breach any implied term of the Plan or any other contract between the Participant and his/her employer. Participation in the Plan and any benefits provided under it shall not be pensionable nor will they count as pay or remuneration when calculating salary related benefits (including, but not limited to, pension).

Section 8 shall be amended to add the following language at the end thereof:

Indemnity for income tax and national insurance contributions: Without prejudice to Section 8 of this RSU Award Agreement, the Participant irrevocably agrees to (i) pay to the Company, his employer or former employer (as appropriate) the amount of any Tax Liability;

or (ii) enter into arrangements to the satisfaction of the Company, his employer or former employer (as appropriate) for payment of any Tax Liability. The Participant irrevocably agrees to enter into a joint election in respect of any Company Shares to be acquired on vesting of the RSUs under section 431(1) or section 431(2) of the Income Tax (Earnings and Pensions) Act 2003 ("ITEPA"), if required to do so by the Company, his employer or former employer, on or before the date of vesting of the RSUs. The Participant hereby appoints the Company (acting by any of its directors from time to time) as the Participant's attorney to (a) sell sufficient Company Shares as specified in Section 8; and (b) execute any joint election that must be entered into under this Section, in the Participant's name and on the Participant's behalf. The Company may appoint one or more persons to act as substitute attorney(s) for the Participant and to exercise one or more of the powers conferred on the Company by the power of attorney set out in this Section, other than the power to appoint a substitute attorney. The Company may subsequently revoke any such appointment. The power of attorney set out in this Section shall be irrevocable, save with the consent of the Company, and is given by security to secure the interest of the Company (for itself and as trustee under this agreement on behalf of any employer or former employer of the Participant) as a person liable to account for or pay any relevant Tax Liability. For the purposes of this Section: (1) "Taxable Event" means any event or circumstance that gives rise to a liability for the Participant to pay income tax, national insurance contributions or both (or their equivalents in any jurisdiction) in respect of (a) the RSUs, including their vesting, assignment or surrender for consideration, or the receipt of any benefit in connection with them; (b) any Company Shares (or other securities or assets): (i) earmarked or held to satisfy the RSUs; (ii) acquired on vesting of the RSUs; (iii) acquired as a result of holding the RSUs; or (iv) acquired in consideration of the assignment or surrender of the RSUs; (c) any securities (or other assets) acquired or earmarked as a result of holding Company Shares (or other securities or assets) mentioned in (b) above; or (d) any amount due under pay as you earn ("PAYE") in respect of securities or assets in (a) to (c) above, including any failure by the Participant to make good such an amount in the time limit specified in section 222 ITEPA; and (2) "Tax Liability" means the total of any income tax and primary class 1 (employee) national insurance contributions (or their equivalents in any jurisdiction) for which any employer (or former employer) of the Participant is or may be liable to account (or reasonably believes it is or may be liable to account) as a result of any Taxable Event.

Section 18 shall be deleted in its entirety and replaced with the following language:

Data Protection: Consent to use of personal data: The Participant hereby acknowledges and consents to the Company and any Subsidiary collecting, processing, storing, sharing and exchanging his/her information (including personal details, data relating to participation, salary, taxation and employment and sensitive personal data, e.g., data relating to physical or mental health, criminal conviction or the alleged commission of offences) (the "Information"), and providing the Company and/or the Subsidiary's agents and/or third parties with the Information, for the sole purpose of the administration and operation of the Plan. The Participant explicitly acknowledges and accepts that the Information may be sent to a country outside of the European Economic Area (such as the United States), whose regulatory provisions in respect of the protection of personal data may differ from those in force in the United Kingdom. The Participant understands that Information will be held only as long as is necessary to implement, administer and manage his /her participation in the Plan. The Participant understands that/he may, at any time, view Information, request

additional information about the storage and processing of Information, obtain the correction, deletion or blocking of Information if it is incomplete or inaccurate, object to the processing of Information on compelling legitimate grounds relating to his/her personal situation or refuse or withdraw the consents herein, in any case without cost, by contacting in writing his/her local human resources representative. The Participant acknowledges that s/he has the right to request a list of the names and addresses of any potential recipients of the Information. The Participant acknowledges that the collection, processing and transfer of the Information is important to Plan administration and that failure to consent to same may prohibit participation in the Plan.

IN WITNESS WHEREOF, the parties hereto have executed this RSU Award Agreement as of the date set forth above.

PATHEON N.V.

By /s/ Jim Mullen

Print Name: Jim Mullen

Title: Chief Executive Officer

The undersigned hereby accepts and agrees to all the terms and provisions of the Plan and foregoing RSU Award Agreement.

PARTICIPANT

Signature: /s/ Michel Lagarde

Print Name: Michel Lagarde

RSU Award Agreement

Thermo Fisher Scientific Inc.
First Amendment to
Restricted Share Unit Award Agreement

WHEREAS, on March 23, 2017 (the “Date of Grant”) Michel Lagarde (the “Participant”) was granted Restricted Share Units pursuant to that certain Restricted Share Unit Award Agreement granted under the Patheon N.V. 2016 Omnibus Incentive Plan;

WHEREAS, on August 29, 2017 Thermo Fisher Scientific Inc. (the “Company”) acquired substantially all of the issued and outstanding shares (the “Acquisition”) of Patheon N.V. (“Patheon”);

WHEREAS, in connection with the Acquisition, each Restricted Share Unit that was outstanding and unvested as of immediately prior to the closing of the Acquisition and that was not held by a non-employee director of Patheon N.V. was canceled and (consistent with the Patheon N.V. 2016 Omnibus Incentive Plan) converted into a restricted stock unit award (an “Adjusted RSU”), with substantially the same terms and conditions (including with respect to vesting) as were applicable to such Restricted Share Units immediately prior to the closing of the Acquisition, with respect to a number of shares of Company common stock that is equal to the product (rounded to the nearest whole share) obtained by multiplying (x) the Exchange Ratio (as that term is defined in the Purchase Agreement by and between the Company, Thermo Fisher (CN) Luxembourg S.À R.L. and Patheon) by (y) the total number of shares subject to the Restricted Share Unit as of immediately prior to the closing of the Acquisition;

WHEREAS, Patheon did not declare any dividends on its common shares between the Date of Grant and August 29, 2017;

WHEREAS, each reference to “the Company” in the Adjusted RSU award agreement means Thermo Fisher Scientific Inc.; and

WHEREAS, the Participant and the Company desire to amend Section 5 of the Participant’s Adjusted RSUs.

NOW THEREFORE, pursuant to Section 17 of the Adjusted RSU award agreement, Section 5 thereof is hereby amended and restated in its entirety as follows:

5. Voting and Other Rights. The Participant shall have no rights of a shareholder until shares are issued upon settlement of the Participant’s RSUs. If at any time during the period between the Date of Grant and the date shares of Company common stock are delivered after the RSU vests, the Company pays a dividend or other distribution with respect to its shares of common stock, including without limitation a distribution of shares of the Company’s stock by reason of a stock dividend, stock split or otherwise, then on the date the shares issuable upon vesting of the RSU are delivered, the Company shall pay the Participant, at the time of delivery of the shares, the dividend or other distribution that would have been paid on such shares if the Participant had owned the

shares during the period beginning on the Date of Grant and ending on the respective delivery date. No dividend or other distribution shall be paid with respect to RSUs that are forfeited.

In witness whereof, the parties hereto have executed this First Amendment to Restricted Share Unit Agreement as of the date set forth below.

THERMO FISHER SCIENTIFIC INC.

PARTICIPANT:

By: /s/ Sharon Briansky
Print Name: Sharon Briansky
Title: Vice President and Secretary

/s/ Michel Lagarde
Michel Lagarde
President, Pharma Services
Thermo Fisher Scientific

Dated: February 27, 2018

**OPTION AGREEMENT
UNDER THE PATHEON N.V.
2016 OMNIBUS INCENTIVE PLAN**

This Award Agreement (this "Option Award Agreement"), dated as of March 23, 2017 (the "Date of Grant"), is made by and between Patheon N.V., a Dutch public limited company (the "Company"), and Michel Lagarde (the "Participant"). Capitalized terms not defined herein shall have the meaning ascribed to them in the Patheon N.V. 2016 Omnibus Incentive Plan (the "Plan"). Where the context permits, references to the Company shall include any successor to the Company.

1. Grant of Option. The Company hereby grants to the Participant an option (the "Option") to purchase 110,402 Company Shares at an exercise price per share of \$26.49 (the "Exercise Price"), subject to all of the terms and conditions of this Option Award Agreement and the Plan.

2. Vesting and Option Term. Subject to Section 4 of this Option Award Agreement, the Option shall vest ratably over the first, second and third anniversaries of the Date of Grant. The Option shall become exercisable with respect to the number of Common Shares subject to the vested portion of the Option. The term of the Option and of this Option Award Agreement (the "Option Term") shall commence on the Date of Grant set forth above and, unless previously terminated pursuant to Section 4 of this Option Award Agreement, shall terminate upon the tenth anniversary of the Date of Grant (the "Expiration Date"). Once exercisable, the Option shall continue to be exercisable at any time or times prior to the Expiration Date, subject to the provisions hereof and of the Plan. As of the Expiration Date, all rights of the Participant hereunder shall terminate.

3. Restrictions. The Option may not be sold, assigned, transferred, pledged, hypothecated or otherwise disposed of or encumbered and shall be subject to a risk of forfeiture until any requirements or restrictions contained in this Option Award Agreement or the Plan have been otherwise satisfied, terminated or expressly waived by the Company in writing. This Option Award Agreement shall not be assignable by the Participant.

4. Termination of Employment. Except as otherwise explicitly set forth in a written individual agreement entered into between the Participant and the Company or any of its Subsidiaries, the following provisions shall apply:

(a) Termination of Employment for Cause. Upon the termination of the Participant's employment with the Company and all Affiliates thereof by the Company for Cause, this Option Award Agreement shall terminate, all rights of the Participant with respect to the Option (whether or not exercisable) shall immediately terminate, and neither the Participant nor any of the Participant's successors, heirs, assigns, or personal representatives shall thereafter have any further rights or interests in such Option.

(b) Qualifying Termination of Employment. Upon termination of the Participant's employment with the Company and all Affiliates thereof (i) on account of death, (ii) due to Disability, (iii) by the Company without Cause or (iv) by the Participant for Good Reason, the Participant shall vest in the next tranche of the Option on a pro rata basis. The prorated portion shall be calculated based on the number of full months in the applicable one-year vesting period during which the Participant was employed by the Company as compared to twelve months. After giving effect to the foregoing, any unvested portion of the Option shall

terminate on the date of such termination of employment and the vested portion of the Option shall remain exercisable for a period of one (1) year from and including the date of termination of the Participant's employment and thereafter the Option shall terminate.

(c) Termination of Employment for any Other Reason. Unless otherwise provided in an individual agreement with the Participant, upon the Participant's termination of employment with the Company and all Affiliates thereof for any reason other than the reasons enumerated in subsections (a) or (b) above, the portion of the Option that is exercisable as of the date of such termination of employment shall remain exercisable for a period of ninety (90) days (and shall terminate thereafter). All additional portions of the Option which are not exercisable as of the date of such termination of employment shall terminate upon the date of such termination of employment.

5. Option Award Agreement Subject to Plan. This Option Award Agreement is made pursuant to all of the provisions of the Plan, which is incorporated herein by this reference, and is intended, and shall be interpreted in a manner, to comply therewith. In the event of any conflict between the provisions of this Option Award Agreement and the provisions of the Plan, the provisions of the Plan shall govern.

6. No Rights to Continuation of Employment. Nothing in the Plan or this Option Award Agreement shall confer upon the Participant any right to continue in the employ of the Company or any Affiliate thereof or shall interfere with or restrict the right of the Company or its Affiliates to terminate the Participant's employment at any time for any reason whatsoever, with or without Cause.

7. Tax Withholding. The Participant is responsible for all taxes, including any federal, state, or local taxes, social security contributions and national insurance premiums due in respect of the Option and the issuance of Common Shares thereof. The Company or a Subsidiary shall be entitled to deduct from the Common Shares otherwise issuable hereunder or other compensation payable to the Participant any sums required by federal, state, local or foreign tax law to be withheld or to satisfy any applicable payroll deductions with respect to the Option. Subject to applicable law, the Company or a Subsidiary shall withhold from Common Shares otherwise issuable upon exercise of the Option, a portion of those Common Shares with an aggregate Fair Market Value (defined as in the Plan but measured as of the date of exercise) equal to the amount of the applicable withholding taxes, contributions and/or premiums; provided, however, that the number of such Common Shares so withheld shall not exceed the amount necessary to satisfy the Company's or the Subsidiary's required tax withholding obligations using the minimum statutory withholding tax rates (or such other amount as may be permitted by applicable law and accounting standards); provided, further, that, subject to applicable law, the Participant may elect to remit to the Company, or the relevant Subsidiary, an amount in cash sufficient to satisfy the applicable withholding taxes, contributions and/or premiums and receive the number of Common Shares issuable hereunder, provided the Company, or the relevant Subsidiary, is notified of the Participant's intention to remit cash prior to the date the Option is subject to taxation.

8. Section 409A Compliance. The intent of the parties is that the payments under this Option Award Agreement are exempt from, or to the extent subject thereto, comply with, Section 409A of the Code, and, accordingly, to the maximum extent permitted, this Option Award Agreement shall be interpreted and administered in accordance therewith. Notwithstanding anything contained herein to the contrary, to the extent required in order to avoid accelerated taxation and/or tax penalties under

Section 409A of the Code, the Participant shall not be considered to have terminated employment with the Company and its Affiliates for purposes of this Option Award Agreement until the Participant would be considered to have incurred a "separation from service" within the meaning of Section 409A of the Code. Any payments described in this Option Award Agreement that are due within the "short-term deferral period" as defined in Section 409A of the Code shall not be treated as deferred compensation unless applicable law requires otherwise. Notwithstanding anything to the contrary in this Option Award Agreement, to the extent that any payment (including Common Share delivery) is to be made upon a separation from service and such payment would result in the imposition of any individual penalty tax and late interest charges imposed under Section 409A of the Code, such payment shall instead be made on the first business day after the date that is six (6) months following such separation from service (or upon the Participant's death, if earlier).

9. Governing Law. This Option Award Agreement shall be governed by, interpreted under, and construed and enforced in accordance with the internal laws, and not the laws pertaining to conflicts or choices of laws, of the State of New York applicable to agreements made and to be performed wholly within the State of New York.

10. Option Award Agreement Binding on Successors. The terms of this Option Award Agreement shall be binding upon the Participant and upon the Participant's heirs, executors, administrators, personal representatives, transferees, assignees and successors in interest, and upon the Company and its successors and assignees, subject to the terms of the Plan.

11. Necessary Acts. The Participant hereby agrees to perform all acts, and to execute and deliver any documents that may be reasonably necessary to carry out the provisions of this Option Award Agreement, including but not limited to all acts and documents related to compliance with federal, state or foreign securities and/or tax laws.

12. Severability. Should any provision of this Option Award Agreement be held by a court of competent jurisdiction to be unenforceable, or enforceable only if modified, such holding shall not affect the validity of the remainder of this Option Award Agreement, the balance of which shall continue to be binding upon the parties hereto with any such modification (if any) to become a part hereof and treated as though contained in this original Option Award Agreement. Moreover, if one or more of the provisions contained in this Option Award Agreement shall for any reason be held to be excessively broad as to scope, activity, subject or otherwise so as to be unenforceable, in lieu of severing such unenforceable provision, such provision or provisions shall be construed by the appropriate judicial body by limiting or reducing it or them, so as to be enforceable to the maximum extent compatible with the applicable law as it shall then appear, and such determination by such judicial body shall not affect the enforceability of such provisions or provisions in any other jurisdiction.

13. Entire Option Award Agreement. Except as set forth in Section 4 hereof, this Option Award Agreement and the Plan contain the entire agreement and understanding among the parties as to the subject matter hereof, and supersedes any other agreements or representations, oral or otherwise, express or implied, with respect to the subject matter hereof.

14. Headings. Headings are used solely for the convenience of the parties and shall not be deemed to be a limitation upon or descriptive of the contents of any such Section.

15. Counterparts: Electronic Signature. This Option Award Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original and all of which together shall be deemed to be one and the same instrument. The Participant's electronic signature of this Option Award Agreement shall have the same validity and effect as a signature affixed by the Participant's hand.

16. Amendment. No amendment or modification hereof shall be valid unless it shall be in writing and signed by all parties hereto.

17. Data Protection. The Participant hereby acknowledges and consents to the Company and any Subsidiary sharing and exchanging his/her information held in order to administer and operate the Plan (including personal details, data relating to participation, salary, taxation and employment and sensitive personal data, e.g. data relating to physical or mental health, criminal conviction or the alleged commission of offences) (the "Information") and providing the Company and/or the Subsidiary's agents and/or third parties with the Information for the administration and operation of the Plan and the Participant further accepts that this may involve the Information being sent to a country outside the country in which the Participant provides services including to a country which may not have the same level of data protection laws as his/her home country. The Participant acknowledges that s/he has the right to request a list of the names and addresses of any potential recipients of the Information and to review and correct the Information by contacting his/her local human resources representative. The Participant acknowledges that the collection, processing and transfer of the Information is important to Plan administration and that failure to consent to same may prohibit participation in the Plan.

18. Additional Matters. This Option Award Agreement is intended to comply with the applicable laws of any country or jurisdiction where the Option is granted under the Plan, and all provisions hereof shall be construed in a manner to so comply. The following provisions shall apply to the Participant, as appropriate:

Australia:

Section 7 shall be amended to add the following language at the end thereof:

This scheme is a scheme to which Subdivision 83A-C of the Income Tax Assessment Act 1997 applies (subject to the conditions in the Income Tax Assessment Act 1997).

Section 17 shall be deleted in its entirety and replaced with the following language:

Data Protection. The Participant hereby acknowledges and consents to the Company and any Subsidiary sharing and exchanging his/her information held in order to administer and operate the Plan (including personal details, data relating to participation, salary, taxation and employment and sensitive personal data, e.g., data relating to physical or mental health, criminal conviction or the alleged commission of offenses) (the "Information") and providing the Company and/or the Subsidiary's agents and/or third parties with the Information for the administration and operation of the Plan. The Participant further accepts that this may involve the Information being sent to a country outside Australia, including to a country which may not have the same level of data protection laws as Australia, and by consenting to this

disclosure the Participant acknowledges that the Company and Subsidiaries may not take steps to ensure that the overseas recipient complies with the Australian Privacy Principles. The Participant acknowledges that s/he has the right to request a list of the names and addresses of any potential recipients of the Information, to review and correct the Information, and to raise any concerns about the handling of the Information, by contacting his/her local human resources representative. The Participant acknowledges that the collection, processing and transfer of the Information is important to Plan administration and that failure to consent to same may prohibit participation in the Plan.

Austria:

Section 17 shall be deleted in its entirety and replaced with the following language:

Data Protection. The Participant hereby acknowledges and consents that the following information required in order to administer and operate the Plan may be processed and shared with the Company, its principal office located at [include address] and [*Print Name of Participant, including the address*]: name, date of birth, address, employee ID, tax number, length of service with the company, award program in which the Participant participates, amount of salary (the "Information"). The Participant will provide the Company and/or the Subsidiary's agents and/or third parties with the Information for the administration and operation of the Plan as requested from time to time. **The Participant further acknowledges and consents that, in order to administer and operate the Plan, the Information may be sent to [*name every Company Affiliate recipient located outside the European Economic Area and every Third Party Affiliate receiving information (e.g., UBS), including its address*] and the Participant acknowledges that these recipients are located in countries which may not have the same level of data protection laws as Austria.** The Participant acknowledges that s/he has the right to request a list of the names and addresses of any potential recipients of the Information and to review and correct the Information by contacting his/her local human resources representative. **The Participant may withdraw his or her consent according to this Consent at any time.** The Participant acknowledges that the collection, processing and transfer of the Information is important to Plan administration and that failure to consent to same (or withdraw the consent) may prohibit participation in the Plan.

Canada:

Section 7 shall be replaced with the following:

Tax Withholding. The Company may withhold from any amount payable to a Participant, either under this Plan or otherwise, such amount as may be necessary to enable the Company to comply with the applicable requirements of any federal, provincial, state or local law, or any administrative policy of any applicable tax authority, relating to the withholding of tax or any other required deductions with respect to Options hereunder ("Withholding Obligations"). The Company shall also have the right in its discretion to satisfy any liability for any Withholding Obligations by selling, or causing a broker to sell, on behalf of any Participant or causing any Participant to sell such number of Shares issued to the Participant sufficient to fund the Withholding Obligations (after deducting any commissions payable to the broker). The Company may require a Participant, as a condition to exercise of an Option,

to make such arrangements as the Company may require so that the Company can satisfy applicable Withholding Obligations on terms and conditions determined by the Company in its sole discretion, including, without limitation, requiring the Participant to (i) remit the amount of any such Withholding Obligations to the Company in advance; (ii) reimburse the Company for any such Withholding Obligations; or (iii) cause a broker who sells Shares acquired by the Participant under the Plan on behalf of the Participant to withhold from the proceeds realized from such sale the amount required to satisfy any such Withholding Obligations and to remit such amount directly to the Company.

Denmark:

Section 4(b) shall be deleted in its entirety and replaced with the following language:

Qualifying Termination of Employment. Upon termination of the Participant's employment with the Company and all Affiliates thereof (i) on account of death, (ii) by the Company without Cause or (iii) by the Participant for Good Reason, the Participant's Option shall continue to vest as though the Participant was still an employee of the Company. Once the Option is vested, the Option shall remain exercisable for a period of one (1) year following the vesting date (and shall terminate thereafter), provided such period occurs prior to the Expiration Date, subject to the provisions hereof and of the Plan.

France:

Section 1 shall be amended to add the following language at the end thereof:

The Option shall be deemed granted under and subject to the terms of the French Sub Plan For The Grant Of French-Qualifying Options To Employees And Officers In France (Exhibit B of the Plan).

Section 17 shall be deleted in its entirety and replaced with the following language:

Data Protection. The Participant hereby acknowledges and consents to the Company and any Subsidiary collecting, processing, storing, sharing and exchanging his/her information (including personal details, data relating to participation, salary, taxation and employment and sensitive personal data, e.g. data relating to physical or mental health, criminal conviction or the alleged commission of offences) (the "Information"), and providing the Company and/or the Subsidiary's agents and/or third parties with the Information, for the sole purpose of the administration and operation of the Plan. The Participant explicitly acknowledges and accepts that the Information may be sent to a country outside of the European Economic Area (such as the United States), whose regulatory provisions in respect of the protection of personal data may differ from those in force in France. The Participant understands that Information will be held only as long as is necessary to implement, administer and manage his /her participation in the Plan. The Participant understands that s/he may, at any time, view Information, request additional information about the storage and processing of Information, obtain the correction, deletion or blocking of Information if it is incomplete or inaccurate, object to the processing of Information on compelling legitimate grounds relating to his/her personal situation or refuse or withdraw the consents herein, in any case without cost, by contacting in writing his/her local human resources representative. The Participant

acknowledges that s/he has the right to request a list of the names and addresses of any potential recipients of the Information. The Participant acknowledges that the collection, processing and transfer of the Information is important to Plan administration and that failure to consent to same may prohibit participation in the Plan.

The following shall be added as Section 19:

French Language Provision. The Participant declares that he/she has a sufficient level of English to understand all the contents of this Option Award Agreement, does not request a translation of this document into his/her mother tongue and accepts that all other texts or documents relating to this Option Award Agreement will be drawn up in English, save where such documents impose obligations (such as the achievement of objectives) on the Participant in which case such documents will be translated into French.

French translation: *Le Participant déclare avoir un niveau d'anglais suffisant pour comprendre l'intégralité du contenu de ce contrat d'attribution d'option, ne demande pas de traduction de ce document dans sa langue maternelle et accepte que tout autre acte ou document relatif à ce contrat d'attribution d'option soit rédigé en anglais, sauf si celui-ci fixe des obligations (telles que la réalisation d'objectifs) pour le Participant auquel cas ces documents seront traduits en français.*

Germany:

Section 6 shall be amended to add the following language at the end thereof:

The Participant acknowledges that the Company is exclusively liable for the grant of Options pursuant to this Option Award Agreement and, with respect to any Participant who is a party to an employment agreement with a German Affiliate, such German Affiliate shall not bear any liability relating to this Option Award Agreement. Tax withholding obligations shall include any obligations to withhold payments on account of social security contributions and national insurance premiums.

Section 7 shall be amended to add the following language at the end thereof:

As used in this Section 7, "Subsidiary" shall include any Subsidiary subject to German withholding tax, social security contributions ("*Sozialversicherungsbeiträge*") and national insurance premiums.

Section 17 shall be deleted in its entirety. The Data Protection language on the Signature Page for Option Award Agreements granted to German Participants shall apply to all German Participants.

Italy:

Section 17 shall be deleted in its entirety and replaced with the following language:

Data Protection: The Participant hereby acknowledges and consents to the Company and any Subsidiary collecting, processing, storing, sharing and exchanging his/her information (including personal details, data relating to participation, salary, taxation and employment and

sensitive personal data, e.g., data relating to physical or mental health, criminal conviction or the alleged commission of offences) (the "**Information**"), and providing the Company and/or the Subsidiary's agents and/or third parties with the Information, for the sole purpose of the administration and operation of the Plan. The Participant explicitly acknowledges and accepts that the Information may be sent to a country outside of the European Economic Area (such as the United States), whose regulatory provisions in respect of the protection of personal data may differ from those in force in Italy. The Participant understands that Information will be held only as long as is necessary to implement, administer and manage his /her participation in the Plan. The Participant understands that s/he may, at any time, view Information, request additional information about the storage and processing of Information, obtain the correction, deletion or blocking of Information if it is incomplete or inaccurate, object to the processing of Information on compelling legitimate grounds relating to his/her personal situation or refuse or withdraw the consents herein, in any case without cost, by contacting in writing his/her local human resources representative. The Participant acknowledges that s/he has the right to request a list of the names and addresses of any potential recipients of the Information. The Participant acknowledges that the collection, processing and transfer of the Information is important to Plan administration and that failure to consent to same may prohibit participation in the Plan. The Company shall be responsible for determining the purposes and methods of transferring and processing the Information, and ensuring security measures are in place.

Japan:

Section 6 shall be amended to add the following language at the end thereof:

This Option Award Agreement shall not become part of the Participant's salary or compensation, nor an acquired right, since it is not intended to compensate the Participant for the Participant's services to the Participant's employer but to be part of a global employee incentive plan implemented by the Company.

People's Republic of China:

Section 6 shall be deleted in its entirety and replaced with the following language:

No Rights to Continuation of Employment. This Option Award Agreement and the Plan are separate from and do not form a part of the employment contract between the Participant and the Company or any Subsidiary. None of the benefits provided under the Plan shall become part of the Participant's salary or remuneration when calculating social insurance contributions or economic compensation which may be payable upon termination of the Participant's employment contract with the Company or any Subsidiary.

United Kingdom:

Section 6 shall be amended to add the following language at the end thereof:

This Option Award Agreement and the Plan are separate from and do not form a part of any contract of employment or any other agreement between the Participant and the Company or any Subsidiary. If the Participant ceases to be employed or engaged by the Company or any Subsidiary for any reason (including as a result of a repudiatory breach of contract by any member of the Group) the Participant shall not be entitled (and by participating in the Plan shall be deemed irrevocably to have waived any entitlement, by way of compensation for loss of employment, breach of contract or otherwise) to any sum or other benefit to compensate the Participant for any rights or prospective rights under the Plan. This exclusion applies equally (and without limitation) to any loss arising from the way in which the discretion is (or is not) exercised under any Section of the Plan even if the exercise (or non-exercise) of such discretion is, or appears to be, irrational or perverse and/or breaches, or is claimed to breach any implied term of the Plan or any other contract between the Participant and his/her employer. Participation in the Plan and any benefits provided under it shall not be pensionable nor will they count as pay or remuneration when calculating salary related benefits (including, but not limited to, pension).

Section 7 shall be amended to add the following language at the end thereof:

Indemnity for income tax and national insurance contributions: Without prejudice to Section 7 of this Option Agreement, the Participant irrevocably agrees to (i) pay to the Company, his employer or former employer (as appropriate) the amount of any Tax Liability; or (ii) enter into arrangements to the satisfaction of the Company, his employer or former employer (as appropriate) for payment of any Tax Liability. The Participant irrevocably agrees that (a) the Participant will reimburse the Company, his employer or former employer (as appropriate) for any secondary class 1 (employer) National Insurance contributions (NICs) (or any similar liability for social security contribution in any jurisdiction), should the Company request such a reimbursement, that (i) the Company or any employer (or former employer) of the Option Holder is liable to pay as a result of any Taxable Event ; and (ii) may be lawfully recovered by the Company or any employer (or former employer) from the Participant and (b) at the request of the Company, his employer or former employer, the Participant shall join that person in making a valid election to transfer to the Participant the whole or any part of the liability for secondary class 1 (employer) NICs (or any similar liability for social security contribution in any jurisdiction). The Participant irrevocably agrees to enter into a joint election in respect of any Company Shares to be acquired on exercise of the Option under section 431(1) or section 431(2) of the Income Tax (Earnings and Pensions) Act 2003 ("ITEPA"), if required to do so by the Company, his employer or former employer, on or before the date of exercise of the Option. The Participant hereby appoints the Company (acting by any of its directors from time to time) as the Participant's attorney to (a) sell sufficient Company Shares as specified in Section 7; and (b) execute any joint election that must be entered into under this Section, in the Participant's name and on the Participant's behalf. The Company may appoint one or more persons to act as substitute attorney(s) for the Participant and to exercise one or more of the powers conferred on the Company by the power of attorney set out in this Section, other than the power to appoint a substitute attorney. The Company may subsequently revoke any such appointment. The power of attorney set out in this Section shall be irrevocable, save with the consent of the Company, and is given by security to secure the interest of the Company (for itself and as trustee under this Option Award Agreement on behalf of any employer or former employer of the Participant) as a person liable to account for or pay any relevant Tax Liability. For the purposes of this

Section: (1) "Taxable Event" means any event or circumstance that gives rise to a liability for the Participant to pay income tax, national insurance contributions or both (or their equivalents in any jurisdiction) in respect of (a) the Option, including its exercise, assignment or surrender for consideration, or the receipt of any benefit in connection with it; (b) any Company Shares (or other securities or assets): (i) earmarked or held to satisfy the Option; (ii) acquired on exercise of the Option; (iii) acquired as a result of holding the Option; or (iv) acquired in consideration of the assignment or surrender of the Option; (c) any securities (or other assets) acquired or earmarked as a result of holding Company Shares (or other securities or assets) mentioned in (b) above; or (d) any amount due under pay as you earn (PAYE) in respect of securities or assets in (a) to (c) above, including any failure by the Participant to make good such an amount in the time limit specified in section 222 ITEPA; and (2) "Tax Liability" means the total of (a) any income tax and primary class 1 (employee) national insurance contributions (or their equivalents in any jurisdiction) for which any employer (or former employer) of the Participant is or may be liable to account (or reasonably believes it is or may be liable to account) as a result of any Taxable Event; and (b) any national insurance contributions (or equivalent in any jurisdiction) that any employer (or former employer) of the Participant is or may be liable to pay (or reasonably believes it is or may be liable to pay) as a result of any Taxable Event that can be recovered lawfully from the Participant.

Section 17 shall be deleted in its entirety and replaced with the following language:

Data Protection; Consent to use of personal data: The Participant hereby acknowledges and consents to the Company and any Subsidiary collecting, processing, storing, sharing and exchanging his/her information (including personal details, data relating to participation, salary, taxation and employment and sensitive personal data, e.g. data relating to physical or mental health, criminal conviction or the alleged commission of offences) (the "Information"), and providing the Company and/or the Subsidiary's agents and/or third parties with the Information, for the sole purpose of the administration and operation of the Plan. The Participant explicitly acknowledges and accepts that the Information may be sent to a country outside of the European Economic Area (such as the United States), whose regulatory provisions in respect of the protection of personal data may differ from those in force in the United Kingdom. The Participant understands that Information will be held only as long as is necessary to implement, administer and manage his /her participation in the Plan. The Participant understands that s/he may, at any time, view Information, request additional information about the storage and processing of Information, obtain the correction, deletion or blocking of Information if it is incomplete or inaccurate, object to the processing of Information on compelling legitimate grounds relating to his/her personal situation or refuse or withdraw the consents herein, in any case without cost, by contacting in writing his/her local human resources representative. The Participant acknowledges that s/he has the right to request a list of the names and addresses of any potential recipients of the Information. The Participant acknowledges that the collection, processing and transfer of the Information is important to Plan administration and that failure to consent to same may prohibit participation in the Plan.

IN WITNESS WHEREOF, the parties hereto have executed this Option Award Agreement as of the date set forth above.

PATHEON N.V.

By /s/ Jim Mullen

Print Name: Jim Mullen

Title: Chief Executive Officer

The undersigned hereby accepts and agrees to all the terms and provisions of the Plan and foregoing Option Award Agreement.

PARTICIPANT

Signature: /s/ Michel Lagarde

Print Name: Michel Lagarde

Option Award Agreement

Form as of 2/25/20

THERMO FISHER SCIENTIFIC INC.
PERFORMANCE RESTRICTED STOCK UNIT AGREEMENT

Granted Under
the **[Name of Equity Incentive Plan]**

1. Award of Restricted Stock Units.

This agreement (the "Agreement") sets forth the terms and conditions of an award by Thermo Fisher Scientific Inc., a Delaware corporation (the "Company"), on _____, 20__ (the "Award Date") to _____ (the "Participant") of _____ restricted stock units of the Company (individually, an "RSU" and collectively, the "RSUs" or the "Award"). Each RSU represents the right to receive one share of common stock, \$1.00 par value, of the Company ("Common Stock") pursuant to the terms, conditions and restrictions set forth in this Agreement and in the Company's **[Name of Equity Incentive Plan]** (the "Plan"). The shares of Common Stock that are issuable upon vesting of the RSUs are referred to in this Agreement as Shares and the number of RSUs shown above is referred to as the "Target Award." Capitalized terms used in this Agreement and not otherwise defined shall have the same meaning as in the Plan.

2. Vesting Schedule.

Except as otherwise provided in paragraphs (b) through (d) of Section 3, the RSUs shall vest in accordance with Schedule A attached hereto and incorporated herein provided that on each Vesting Date (as defined in Schedule A), the Participant is, and has been at all times since the Award Date, an employee, officer or director of, or consultant or advisor to, the Company (an "Eligible Participant").

3. Additional Vesting Provisions.

(a) Termination of Relationship with the Company. In the event that the Participant ceases to be an Eligible Participant for any reason other than those set forth in paragraphs (b) through (d) below before the Final Vesting Date (as defined in Schedule A), the RSUs that have not previously vested shall be immediately forfeited to the Company.

(b) Death or Disability. In the event that the Participant's employment with the Company is terminated by reason of death or Disability after the Performance Certification Date (as defined in Schedule A) but prior to the Final Vesting Date, then all unvested RSUs (based on the number of RSUs determined on the Performance Certification Date to be eligible to be received) shall vest 100% upon the date of such termination due to death or Disability.

(c) Change in Control Event. In the event that the Participant's employment or service is terminated by the Company due to a Qualifying Termination (as defined in Section 5(c) below) within 18 months after a Change in Control Event that occurs prior to the Performance Certification Date, then all unvested RSUs (based on the number of RSUs determined to be eligible to be received assuming the last day of the performance period was the last day of the fiscal quarter immediately prior to the Change in Control Event) shall vest immediately upon such Qualifying Termination (without regard to performance for any periods following the last day of the fiscal quarter immediately prior to the Change in Control Event), provided that the Compensation Committee of the Board of Directors has certified the achievement of the performance conditions. In the event of such termination on or after the Performance Certification Date but before the Final Vesting Date, then all unvested RSUs (based on the number of RSUs determined on the Performance Certification Date to be eligible to be received) shall vest upon the date of such termination.

(d) Retirement. If the Participant Retires from the Company after the later of (i) the Performance Certification Date or (ii) the second anniversary of the Award Date, then nevertheless the Participant shall become vested in the remaining RSUs to be delivered (calculated based on the units earned as of the Performance Certification Date).

(e) Discharge for Cause. In the event that the Participant is discharged by the Company for Cause (as defined below), all unvested RSUs and all vested RSUs that have not been delivered in accordance with Section 4 below shall terminate immediately upon the effective date of such discharge. The Participant shall be considered to have been discharged for Cause if the Company determines, within thirty (30) days after the Participant's resignation, that discharge for Cause was warranted.

4. Delivery of Shares.

(a) Except as provided in (b) below, the Company shall deliver the Shares that become issuable pursuant to an RSU within the sixty (60) day period following the date the RSUs vest pursuant to Sections 2 or 3 above, but in no event later than the last day of the period specified in Treas. Reg. section 1.409A-1(b)(4)(i)(A).

(b) In the event that the Participant Retires under the conditions of Section 3(d) above, the Company shall deliver the Shares that become issuable pursuant to an RSU, to the extent not previously delivered, within the sixty (60) day period following the date such RSUs would have vested had the Participant remained employed with the Company.

(c) The Company shall not be obligated to deliver Shares to the Participant unless the issuance and delivery of such Shares shall comply with all relevant provisions of law and other legal requirements including, without limitation, any applicable federal or state securities laws and the requirements of any stock exchange upon which shares of Common Stock may then be listed.

5. Meaning and Use of Certain Terms.

For purposes of this Agreement,

(a) “Change in Control Event” has the meaning ascribed to it in the Plan, except that for purposes of Section 4, the liquidation of the Company shall not be treated as a Change in Control Event. Payments in connection with the liquidation of the Company shall be made only as permitted under Section 409A of the Treasury Regulations Code (“Section 409A”).

(b) “Disability” or “Disabled.” A Participant shall be deemed to be disabled at such time as the Participant is receiving disability benefits under the Company’s Long Term Disability Coverage, as then in effect; provided however that the Participant shall not be treated as Disabled unless the disability is described under Section 409A.

(c) “Qualifying Termination.” A Participant has a Qualifying Termination if the Participant’s employment or service is terminated by the Company without Cause or by the Participant for Good Reason and such termination results in a separation from service under Section 409A.

(d) “Retire” or “Retirement.” A Participant shall be deemed to have retired from the Company upon his or her resignation from employment with the Company either (i) after the age of fifty-five (55) and the completion of ten (10) continuous years of service to the Company comprising at least twenty (20) hours per week or (ii) after the age of sixty (60) and the completion of five (5) continuous years of service to the Company comprising at least twenty (20) hours per week. For purposes of this Agreement and for the sake of clarity, subject to execution of a release of claims in a form acceptable to the Company, the Participant may seek to re-characterize any termination of employment initiated by the Company, or a subsidiary of the Company, that is not a “termination for Cause” as a voluntary termination by reason of Retirement, in which case the Participant shall not be entitled to receive any severance or other benefits that would have otherwise been provided by the Company to the Participant pursuant to any agreement between the Company and the Participant or any Company policy. Any such determination shall be made by the Committee in its sole discretion.

6. Restrictions on Transfer.

The Participant shall not sell, assign, transfer, pledge, hypothecate, or otherwise dispose of, by operation of law or otherwise (collectively “transfer”) any RSUs, or any interest therein, except by will or the laws of descent and distribution.

7. Provisions of the Plan.

This Agreement is subject to the provisions of the Plan, a copy of which is furnished to the Participant with this Agreement.

8. Dividends; Other Corporate Transactions.

(a) If at any time during the period between the Performance Certification Date and the date that Shares are delivered after the RSU vests, the Company pays a dividend or other distribution with respect to its Common Stock, including without limitation a distribution of shares of the Company’s stock by reason of a stock dividend, stock split or otherwise, then on the

date the Shares issuable upon vesting of the RSU are delivered, the Company shall pay the Participant, at the time of delivery of Shares pursuant to Section 4, the dividend or other distribution that would have been paid on such Shares if the Participant had owned such Shares during the period beginning on the Performance Certification Date and ending on the respective delivery date. No dividend or other distribution shall be paid with respect to RSUs that are forfeited.

(b) In the event of a Reorganization Event, then the rights of the Company under this Agreement and all other terms of this Agreement (including without limitation vesting provisions) shall inure to the benefit of the Company's successor and shall apply to the cash, securities, or other property which the Common Stock was converted into or exchanged for pursuant to such Reorganization Event in the same manner and to the same extent as they applied to the Shares. Such cash, securities, or other property shall be delivered or paid at the time provided in Section 4.

(c) Except as set forth in Section 8(a) or (b) above and in the Plan, neither the Participant nor any person claiming under or through the Participant shall be, or have any rights or privileges of, a stockholder of the Company in respect of the Shares issuable pursuant to the RSUs granted hereunder until the Shares have been delivered to the Participant.

9. Withholding Taxes; No Section 83(b) Election.

(a) The Participant expressly acknowledges that the delivery of Shares to the Participant will give rise to "wages" subject to withholding. Unless the Participant provides notice to the Company prior to the delivery of the Shares that the Participant will make payment to the Company on the date of delivery to satisfy all required withholding taxes, the Participant hereby authorizes the Company to hold back from the shares to be delivered pursuant to Section 4 of this Agreement that number of shares calculated to satisfy all such federal, state, local, or other applicable taxes required to be withheld in connection with such delivery of Shares; provided, however, that the total tax withholding where Shares are being used to satisfy such tax obligations cannot exceed the Company's minimum statutory withholding obligations (based on minimum statutory withholding rates for federal and state tax purposes, including payroll taxes, that are applicable to such wages).

(b) The Participant acknowledges that no election under Section 83(b) of the Code may be filed with respect to this Award.

10. No Right To Employment or Other Status. The grant of an award of RSUs shall not be construed as giving the Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with the Participant free from any liability or claim under the Plan or this Agreement, except as expressly provided herein.

11. Conflicts With Other Agreements. In the event of any conflict or inconsistency between the terms of this Agreement and any employment, severance, or other agreement between the Company and the Participant, the terms of this Agreement shall govern.

12. Governing Law. Except as provided in Addendum A, this Agreement shall be governed by and interpreted in accordance with the laws of the State of Delaware without regard to any applicable conflicts of laws and in the event of a dispute related to or arising out of this Agreement, the parties submit to the exclusive jurisdiction and venue of the Delaware federal and Chancery Courts.

13. Unfunded Rights. The right of the Participant to receive Common Stock pursuant to this Agreement is an unfunded and unsecured obligation of the Company. The Participant shall have no rights under this Agreement other than those of an unsecured general creditor of the Company.

14. Compliance with Section 409A of the Code. This Agreement is intended to provide for deferred compensation that is exempt from or compliant with Section 409A and shall be interpreted consistently with such intent. Accordingly, the Participant shall have no right to designate the taxable year of payment. Notwithstanding any other provision of this Agreement, if and to the extent any portion of any payment under this Agreement to the Participant is payable upon his or her separation from service and the Participant is a specified employee as defined in Section 409A(a)(2)(B)(i), as determined by the Company in accordance with its procedures, by which determination the Participant (through accepting the Award) agrees that he or she is bound, such portion of the payment, compensation or other benefit shall not be paid before the day that is six (6) months plus one (1) day after the date of "separation from service", except as Section 409A may then permit.

The Company makes no representations or warranty and shall have no liability to the Participant or any other person if any provisions of or payments, compensation or other benefits under this Agreement are determined to constitute nonqualified deferred compensation subject to Section 409A but do not satisfy the conditions of that section.

15. Clawback. In accepting this Award, the Participant expressly agrees to be bound by, and subject to, the following clawback policy and any clawback policy that the Company has in effect or may adopt in the future:

(a) The Award is intended to align the Participant's long-term interests with those of the Company. Accordingly, subject to Addendum A and unless otherwise expressly provided in the Plan or any other applicable agreement, plan, or policy, and to the extent permitted by applicable law, the Company may terminate any unsettled RSUs, whether vested or unvested ("Termination"), recapture any Shares acquired pursuant to the RSUs ("Recapture"), or require the Participant to reimburse the Company for any and all amounts realized from the acquisition or disposition of Shares acquired pursuant to the RSUs ("Reimbursement"), upon the occurrence of any of the following events (collectively, the "Conditions"):

(i) the Participant has engaged in misuse of the Company's confidential information and/or conduct in breach of any (A) confidentiality obligation to the Company under any agreement between the Company and the Participant, or any policy or plan of the Company, including but not limited to, the Company's standard form of Information and Invention Agreement applicable to such Participant, or (B) applicable noncompetition or nonsolicitation obligation to the Company under any applicable

agreement between the Company and the Participant, or any policy or plan of the Company, including but not limited to the Company's standard form of Noncompetition Agreement applicable to such Participant;

(ii) the Participant has been terminated for willfully engaging in illegal conduct or gross misconduct which is materially and demonstrably injurious to the Company ("*Cause*"). For purposes of the foregoing, no act or failure to act by the Participant shall be considered "willfull" unless it is done or omitted to be done, in bad faith and without reasonable belief that the Participant's action or omission was in the best interests of the Company; or

(iii) during his or her employment, the Participant (A) has rendered services to or otherwise directly or indirectly engaged in or assisted, any organization or business that, in the judgment of the Company in its sole and absolute discretion, is against the interest of the Company or one of its Affiliates; or (B) has engaged in activities that are materially prejudicial to or in conflict with the interests of the Company, including any breaches of fiduciary duty or the duty of loyalty.

For purposes of this Section 15, "RSU Benefits" shall mean any and all amounts realized from the acquisition or disposition of Shares acquired pursuant to the RSUs, including any sales proceeds, dividends and/or dividend equivalents.

(b) Prior to the issuance of any Shares upon settlement of vested RSUs pursuant to this Agreement, the Participant shall, if requested in writing by the Company, certify on a form acceptable to the Company that the Participant is in compliance with the terms and conditions of this Agreement and with the obligations contained in the Plan, or any other relevant agreement, plan, or contract listed in Section 15(a).

(c) Within ten (10) calendar days after receiving notice from the Company of any such activity described in Section 15(a) of this Agreement, the Participant shall either deliver to the Company the applicable Shares or make a cash payment to the Company equal to the RSU Benefits. For purposes of the Company's exercise of its Recapture and/or Reimbursement rights hereunder, the Participant expressly and explicitly authorizes the Company to issue instructions, on the Participant's behalf, to any brokerage firm and/or third-party administrator engaged by the Company to hold Shares and other amounts acquired under the Plan to re-convey, transfer or otherwise return such Shares and/or other amounts to the Company.

(d) Notwithstanding the foregoing provisions of this Section 15, the Company may, in its sole and absolute discretion, choose to refrain from exercising its rights of Termination, Recapture and/or Reimbursement with respect to any particular act of the Participant or with respect to any other participant in the Plan, and its determination to refrain from exercising such rights shall not in any way reduce or eliminate the Company's authority to exercise its rights of Termination, Recapture and/or Reimbursement with respect to any other act of the Participant. Nothing in this Section 15 shall be construed to impose obligations on the Participant to refrain from engaging in lawful competition with the Company after the termination of employment that does not violate the Conditions, other than any obligations that are part of any applicable separate agreement between the Company and the Participant or that arise under applicable law.

(e) Notwithstanding anything to the contrary in the Plan or this Agreement, the Company shall not seek to exercise its rights of Termination, Recapture or Reimbursement relating to any RSUs that were vested and settled more than twelve (12) months prior to the date of the Participant's act or omission set forth in Section 15(a). All RSUs shall be subject to the Company's rights of Termination, Recapture and/or Reimbursement to the extent required by applicable law, including but not limited to Section 10D of the Securities Exchange Act of 1934.

16. Affirmative Acceptance of Award. As a condition to the grant of this Award, the Participant must affirmatively accept this Award and Agreement by logging onto Fidelity's website at www.netbenefits.fidelity.com and completing the acceptance procedures reflected therein within 364 calendar days of the Award Date (the "Award Acceptance Deadline"). If the Participant fails to accept this Award and Agreement by the Award Acceptance Deadline, this Award automatically will be forfeited and immediately terminate without any further action by the parties.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

THERMO FISHER SCIENTIFIC INC.

By: _____

Title: _____

Address: _____

[Name of Participant]

Address: _____

Addendum A

1. Massachusetts.

For Participants domiciled in the State of Massachusetts, the following language shall be added to Section 15(a)(i) of this Agreement:

Notwithstanding Section 12 of this Agreement, for any Termination, Recapture, and/or Reimbursement that is based, in whole or in part, on the Participant's breach of a noncompete agreement or nonsolicitation obligation, such disputes shall be governed by and interpreted in accordance with the laws of the State of Massachusetts, and any dispute arising out of the Agreement shall be asserted exclusively in the federal or state courts located in or covering the county in which the employee resides within the State of Massachusetts, and the Parties hereby submit to the personal jurisdiction and venue of those state and federal courts.

2. California.

For Participants domiciled in the State of California, Section 15(a)(i)(B) of this Agreement shall not apply except to the extent a noncompetition and/or non-solicitation agreement exists and is subject to California Business & Professions Code section 16601 *et seq.*

Form as of 2/25/20

THERMO FISHER SCIENTIFIC INC.
RESTRICTED STOCK UNIT AGREEMENT

Granted Under
the **[Name of Equity Plan]**

1. Award of Restricted Stock Units.

This agreement (the "Agreement") sets forth the terms and conditions of an award by Thermo Fisher Scientific Inc., a Delaware corporation, on _____, 20__ (the "Award Date") to _____ (the "Participant") of _____ restricted stock units of the Company (individually, an "RSU" and collectively, the "RSUs" or the "Award"). Each RSU represents the right to receive one share of common stock, \$1.00 par value, of the Company ("Common Stock") pursuant to the terms, conditions and restrictions set forth in this Agreement and in the Company's **[Name of Equity Plan]** (the "Plan"). The shares of Common Stock that are issuable in connection with the RSUs are referred to in this Agreement as Shares. Capitalized terms used in this Agreement and not otherwise defined shall have the same meaning as in the Plan.

2. Time-Based Vesting.

Except as otherwise provided in paragraphs (b) through (d) of Section 3, the RSUs shall vest as to 15% of the original number of RSUs on the date that is six months following the Award Date (the "First Vesting Date"), as to an additional 25% of the original number of RSUs on the first anniversary of the First Vesting Date (the "Second Vesting Date"), as to an additional 30% of the original number of RSUs on the second anniversary of the First Vesting Date (the "Third Vesting Date"), and as to an additional 30% of the original number of RSUs on the third anniversary of the First Vesting Date (the "Final Vesting Date" and each of the First Vesting Date, Second Vesting Date, Third Vesting Date and Final Vesting Date a "Vesting Date") provided that on each such Vesting Date, the Participant is, and has been at all times since the Award Date, an employee, officer or director of, or consultant or advisor to, the Company (an "Eligible Participant").

3. Additional Vesting Provisions.

(a) Termination of Relationship with the Company. In the event that the Participant ceases to be an Eligible Participant for any reason not described in paragraphs (b) through (d) below, RSUs that have not previously vested shall be immediately forfeited to the Company.

(b) Death or Disability. In the event that the Participant's employment with the Company is terminated by reason of death or Disability prior to the Final Vesting Date, the RSUs that have not previously vested shall vest 100% upon the date of such termination due to death or Disability.

(c) Change in Control Event. In the event that the Participant's employment or service is terminated by the Company due to a Qualifying Termination (defined in Section 5(c) below) within 18 months after a Change in Control Event that occurs prior the Final Vesting Date, the RSUs that have not previously vested shall vest 100% upon the date of such termination.

(d) Retirement. If the Participant Retires from the Company prior to the Final Vesting Date, the RSUs that have not previously vested shall vest 100% upon the effective date of such Retirement, provided that the Retirement date occurs at least two years after the Award Date.

(e) Discharge for Cause. In the event that the Participant is discharged by the Company for Cause (as defined below), all unvested RSUs and all vested RSUs that have not been delivered in accordance with Section 4 below shall terminate immediately upon the effective date of such discharge. The Participant shall be considered to have been discharged for Cause if the Company determines, within thirty (30) days after the Participant's resignation, that discharge for Cause was warranted.

4. Delivery of Shares

(a) The Company shall deliver the Shares that become issuable pursuant to an RSU within the sixty (60) day period following the date the RSUs vest pursuant to Sections 2 or 3 above.

(b) The Company shall not be obligated to deliver Shares to the Participant unless the issuance and delivery of such Shares shall comply with all relevant provisions of law and other legal requirements including, without limitation, any applicable federal or state securities laws and the requirements of any stock exchange upon which shares of Common Stock may then be listed.

5. Meaning and Use of Certain Terms

For purposes of this Agreement,

(a) "Change in Control Event" has the meaning ascribed to it in the Plan, except that for purposes of Section 4, the liquidation of the Company shall not be treated as a Change in Control Event. Payments in connection with the liquidation of the Company shall be made only as permitted under Section 409A of the Treasury Regulations Code ("Section 409A").

(b) "Disability" or "Disabled". A Participant shall be deemed to be disabled at such time as the Participant is receiving disability benefits under the Company's Long Term

Disability Coverage, as then in effect; provided however that the Participant shall not be treated as Disabled unless the disability is described under Section 409A.

(c) “Qualifying Termination”. A Participant has a Qualifying Termination if the Participant’s employment or service is terminated by the Company without Cause or by the Participant for Good Reason and such termination results in a separation from service under Section 409A.

(d) “Retire” or “Retirement”. A Participant shall be deemed to have retired from the Company upon his or her resignation from employment with the Company either (i) after the age of fifty-five (55) and the completion of ten (10) continuous years of service to the Company comprising at least twenty (20) hours per week or (ii) after the age of sixty (60) and the completion of five (5) continuous years of service to the Company comprising at least twenty (20) hours per week. For purposes of this Agreement and for the sake of clarity, subject to execution of a release of claims in a form acceptable to the Company, the Participant may seek to re-characterize any termination of employment initiated by the Company, or a subsidiary of the Company, that is not a “termination for Cause” as a voluntary termination by reason of Retirement, in which case the Participant shall not be entitled to receive any severance or other benefits that would have otherwise been provided by the Company to the Participant pursuant to any agreement between the Company and the Participant or any Company policy. Any such determination shall be made by the Committee in its sole discretion.

6. Restrictions on Transfer.

The Participant shall not sell, assign, transfer, pledge, hypothecate or otherwise dispose of, by operation of law or otherwise (collectively “transfer”) any RSUs, or any interest therein, except by will or the laws of descent and distribution.

7. Provisions of the Plan.

This Agreement is subject to the provisions of the Plan, a copy of which is furnished to the Participant with this Agreement.

8. Dividends; Other Corporate Transactions.

(a) If at any time during the period between the Award Date and the date that Shares are delivered after the RSU vests, the Company pays a dividend or other distribution with respect to its Common Stock, including without limitation a distribution of shares of the Company’s stock by reason of a stock dividend, stock split or otherwise, then on the date the Shares issuable upon vesting of the RSU are delivered, the Company shall pay the Participant, at the time of delivery of the Shares pursuant to Section 4, the dividend or other distribution that would have been paid on such Shares if the Participant had owned such Shares during the period beginning on the Award Date and ending on the respective delivery date. No dividend or other distribution shall be paid with respect to RSUs that are forfeited.

(b) In the event of a Reorganization Event, then the rights of the Company under this Agreement and all other terms of this Agreement (including without limitation vesting

provisions) shall inure to the benefit of the Company's successor and shall apply to the cash, securities or other property which the Common Stock was converted into or exchanged for pursuant to such Reorganization Event in the same manner and to the same extent as they applied to the Shares. Such cash, securities or other property shall be delivered or paid at the time provided in Section 4.

(c) Except as set forth in Section 8(a) or (b) above and in the Plan, neither the Participant nor any person claiming under or through the Participant shall be, or have any rights or privileges of, a stockholder of the Company in respect of the Shares issuable pursuant to the RSUs granted hereunder until the Shares have been delivered to the Participant.

9. Withholding Taxes; No Section 83(b) Election.

(a) The Participant expressly acknowledges that the delivery of Shares to the Participant will give rise to "wages" subject to withholding. Unless the Participant provides notice to the Company prior to the delivery of the Shares that the Participant will make payment to the Company on the date of delivery to satisfy all required withholding taxes, the Participant hereby authorizes the Company to hold back from the shares to be delivered pursuant to Section 4 of this Agreement that number of shares calculated to satisfy all such federal, state, local or other applicable taxes required to be withheld in connection with such delivery of Shares; provided, however, that the total tax withholding where Shares are being used to satisfy such tax obligations cannot exceed the Company's minimum statutory withholding obligations (based on minimum statutory withholding rates for federal and state tax purposes, including payroll taxes, that are applicable to such wages).

(b) The Participant acknowledges that no election under Section 83(b) of the Code may be filed with respect to this Award.

10. No Right To Employment or Other Status. The grant of an award of RSUs shall not be construed as giving the Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with the Participant free from any liability or claim under the Plan or this Agreement, except as expressly provided herein.

11. Conflicts With Other Agreements. In the event of any conflict or inconsistency between the terms of this Agreement and any employment, severance or other agreement between the Company and the Participant, the terms of this Agreement shall govern.

12. Governing Law. Except as provided in Addendum A, this Agreement shall be governed by and interpreted in accordance with the laws of the State of Delaware without regard to any applicable conflicts of laws and in the event of a dispute related to or arising out of this Agreement, the parties submit to the exclusive jurisdiction and venue of the Delaware federal and Chancery Courts.

13. Unfunded Rights. The right of the Participant to receive Common Stock pursuant to this Agreement is an unfunded and unsecured obligation of the Company. The Participant shall have

no rights under this Agreement other than those of an unsecured general creditor of the Company.

14. Compliance with Section 409A of the Code. This Agreement is intended to provide for deferred compensation that is exempt from or compliant with Section 409A and shall be interpreted consistently with such intent. Accordingly, the Participant shall have no right to designate the taxable year of payment. Notwithstanding any other provision of this Agreement, if and to the extent any portion of any payment under this Agreement to the Participant is payable upon his or her separation from service and the Participant is a specified employee as defined in Section 409A(a)(2)(B)(i), as determined by the Company in accordance with its procedures, by which determination the Participant (through accepting the Award) agrees that he or she is bound, such portion of the payment, compensation or other benefit shall not be paid before the day that is six (6) months plus one (1) day after the date of “separation from service”, except as Section 409A may then permit.

The Company makes no representations or warranty and shall have no liability to the Participant or any other person if any provisions of or payments, compensation or other benefits under this Agreement are determined to constitute nonqualified deferred compensation subject to Section 409A but do not satisfy the conditions of that section.

15. Clawback. In accepting this Award, the Participant expressly agrees to be bound by, and subject to, the following clawback policy and any clawback policy that the Company has in effect or may adopt in the future:

(a) The Award is intended to align the Participant’s long-term interests with those of the Company. Accordingly, subject to Addendum A and unless otherwise expressly provided in the Plan or any other applicable agreement, plan, or policy, and to the extent permitted by applicable law, the Company may terminate any unsettled RSUs, whether vested or unvested (“Termination”), recapture any Shares acquired pursuant to the RSUs (“Recapture”), or require the Participant to reimburse the Company for any and all amounts realized from the acquisition or disposition of Shares acquired pursuant to the RSUs (“Reimbursement”), upon the occurrence of any of the following events (collectively, the “Conditions”):

(i) the Participant has engaged in misuse of the Company’s confidential information and/or conduct in breach of any (A) confidentiality obligation to the Company under any agreement between the Company and the Participant, or any policy or plan of the Company, including but not limited to, the Company’s standard form of Information and Invention Agreement applicable to such Participant, or (B) applicable noncompetition or nonsolicitation obligation to the Company under any applicable agreement between the Company and the Participant, or any policy or plan of the Company, including but not limited to the Company’s standard form of Noncompetition Agreement applicable to such Participant;

(ii) the Participant has been terminated for willfully engaging in illegal conduct or gross misconduct which is materially and demonstrably injurious to the Company (“Cause”). For purposes of the foregoing, no act or failure to act by the Participant shall be considered “willfull” unless it is done or omitted to be done, in bad faith and without reasonable belief that the Participant’s action or omission was in the best interests of the Company; or

(iii) during his or her employment, the Participant (A) has rendered services to or otherwise directly or indirectly engaged in or assisted, any organization or business that, in the judgment of the Company in its sole and absolute discretion, is against the interest of the Company or one of its Affiliates; or (B) has engaged in activities that are materially prejudicial to or in conflict with the interests of the Company, including any breaches of fiduciary duty or the duty of loyalty.

For purposes of this Section 15, “RSU Benefits” shall mean any and all amounts realized from the acquisition or disposition of Shares acquired pursuant to the RSUs, including any sales proceeds, dividends and/or dividend equivalents.

(b) Prior to the issuance of any Shares upon settlement of vested RSUs pursuant to this Agreement, the Participant shall, if requested in writing by the Company, certify on a form acceptable to the Company that the Participant is in compliance with the terms and conditions of this Agreement and with the obligations contained in the Plan, or any other relevant agreement, plan, or contract listed in Section 15(a).

(c) Within ten (10) calendar days after receiving notice from the Company of any such activity described in Section 15(a) of this Agreement, the Participant shall either deliver to the Company the applicable Shares or make a cash payment to the Company equal to the RSU Benefits. For purposes of the Company's exercise of its Recapture and/or Reimbursement rights hereunder, the Participant expressly and explicitly authorizes the Company to issue instructions, on the Participant's behalf, to any brokerage firm and/or third-party administrator engaged by the Company to hold Shares and other amounts acquired under the Plan to re-convey, transfer or otherwise return such Shares and/or other amounts to the Company.

(d) Notwithstanding the foregoing provisions of this Section 15, the Company may, in its sole and absolute discretion, choose to refrain from exercising its rights of Termination, Recapture and/or Reimbursement with respect to any particular act of the Participant or with respect to any other participant in the Plan, and its determination to refrain from exercising such rights shall not in any way reduce or eliminate the Company's authority to exercise its rights of Termination, Recapture and/or Reimbursement with respect to any other act of the Participant. Nothing in this Section 15 shall be construed to impose obligations on the Participant to refrain from engaging in lawful competition with the Company after the termination of employment that does not violate the Conditions, other than any obligations that are part of any applicable separate agreement between the Company and the Participant or that arise under applicable law.

(e) Notwithstanding anything to the contrary in the Plan or this Agreement, the Company shall not seek to exercise its rights of Termination, Recapture or Reimbursement relating to any RSUs that were vested and settled more than twelve (12) months prior to the date of the Participant's act or omission set forth in Section 15(a). All RSUs shall be subject to the Company's rights of Termination, Recapture and/or Reimbursement to the extent required by applicable law, including but not limited to Section 10D of the Securities Exchange Act of 1934.

16. Affirmative Acceptance of Award. As a condition to the grant of this Award, the Participant must affirmatively accept this Award and Agreement by logging onto Fidelity's

website at www.netbenefits.fidelity.com and completing the acceptance procedures reflected therein by no later than one day prior to the First Vesting Date (the "Award Acceptance Deadline"). If the Participant fails to accept this Award and Agreement by the Award Acceptance Deadline, this Award automatically will be forfeited and immediately terminate without any further action by the parties.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

THERMO FISHER SCIENTIFIC INC.

By: _____

Title: _____

Address: _____

[Name of Participant]

Address: _____

Addendum A

1. Massachusetts.

For Participants domiciled in the State of Massachusetts, the following language shall be added to Section 15(a)(i) of this Agreement:

Notwithstanding Section 12 of this Agreement, for any Termination, Recapture, and/or Reimbursement that is based, in whole or in part, on the Participant's breach of a noncompete agreement or nonsolicitation obligation, such disputes shall be governed by and interpreted in accordance with the laws of the State of Massachusetts, and any dispute arising out of the Agreement shall be asserted exclusively in the federal or state courts located in or covering the county in which the employee resides within the State of Massachusetts, and the Parties hereby submit to the personal jurisdiction and venue of those state and federal courts.

2. California.

For Participants domiciled in the State of California, Section 15(a)(i)(B) of this Agreement shall not apply except to the extent a noncompetition and/or non-solicitation agreement exists and is subject to California Business & Professions Code section 16601 *et seq.*

Officer Form as of 2/25/20

THERMO FISHER SCIENTIFIC INC.

NONSTATUTORY STOCK OPTION AGREEMENT

Granted Under
[NAME OF EQUITY INCENTIVE PLAN]

1. Grant of Option.

This agreement evidences the grant by Thermo Fisher Scientific Inc., a Delaware corporation (the "Company"), on [], 20[] (the "Grant Date") to [] (the "Participant"), an employee, officer, consultant, or director of the Company or one of its Subsidiaries, of an Option to purchase, in whole or in part, on the terms provided herein and in the Company's *[Name of Equity Incentive Plan]* (the "Plan"), a total of [] shares (the "Shares") of common stock, \$1.00 par value per share, of the Company ("Common Stock") at \$[] per Share. Unless earlier terminated, this Option shall expire at 5:00 p.m., Eastern time, on [] (the "Final Exercise Date").

It is intended that the Option evidenced by this agreement shall not be an incentive stock Option as defined in Section 422 of the Code. Except as otherwise indicated by the context, the term "Participant", as used in this Option, shall be deemed to include any person who acquires the right to exercise this Option validly under its terms. Capitalized terms used in this Agreement and not otherwise defined shall have the same meaning as in the Plan.

2. Vesting Schedule. Except as otherwise provided in paragraphs (c) through (f) of Section 3 below and the Plan, this Option will become exercisable ("vest") as to _____. ***[The vesting of this Option shall be in accordance with the provision of the Plan. In the event of this Option vests based solely on the passage of time, insert the following in the blank above: "[]% of the original number of Shares on the [] anniversary of the Grant Date (the "First Vesting Date") and as to an additional [] % of the original number of Shares at the end of [each] anniversary of the Grant Date following the first anniversary of the Grant Date until the [] anniversary of the Grant Date"]*** provided that on each such vesting date the Participant is, and has been at all times since the Grant Date, an employee, officer or director of, or consultant or advisor to, the Company (an "Eligible Participant"). The right of exercise shall be cumulative so that to the extent the Option is not exercised in any period to the maximum extent permissible it shall continue to be exercisable, in whole or in part, with respect to all Shares for which it is vested until the earlier of the Final Exercise Date or the termination of this Option under Section 3 hereof.

3. Exercise of Option.

(a) Form of Exercise. Each election to exercise this Option shall be in accordance with the instructions provided from time to time by the Company. The Participant may purchase less than the number of shares covered hereby, provided that no partial exercise of this Option may be for any fractional share.

(b) Termination of Relationship with the Company. If the Participant ceases to be an Eligible Participant for any reason, then, except as provided in paragraphs (c)-(f) below, the right to exercise this Option shall terminate three months after such cessation (but in no event after the Final Exercise Date), provided that this Option shall be exercisable only to the extent that the Participant was entitled to exercise this Option on the date of such cessation.

(c) Death or Disability. If the Participant's employment with the Company or a Subsidiary is terminated by reason of death or "disability" (as defined below) prior to the Final Exercise Date while he or she is an Eligible Participant, this Option shall vest and become 100% exercisable upon the date of such termination due to death or disability and the right to exercise this Option shall terminate one year following such date (but in no event after the Final Exercise Date). For the purposes of this Agreement, a Participant shall be deemed to be "disabled" at such time as the Participant is receiving disability benefits under the Company's Long Term Disability Coverage, as then in effect.

(d) Discharge for Cause. If the Participant, prior to the Final Exercise Date, is discharged by the Company or a Subsidiary for "Cause" (as defined below), the right to exercise this Option shall terminate immediately upon the effective date of such discharge. The Participant shall be considered to have been discharged for Cause if the Company determines, within thirty (30) days after the Participant's resignation, that discharge for Cause was warranted.

(e) Retirement. If the Participant "retires" from the Company or a Subsidiary prior to the Final Exercise Date then, subject to Section 3(d) above, this Option shall vest and become 100% exercisable upon the date of such retirement and the right to exercise this Option shall terminate on the Final Exercise Date, provided that the retirement date occurs at least two years after the Grant Date. For the purposes of this Agreement, a Participant shall be deemed to have "retired" (i) in the event of a non-employee director of the Company, when he or she ceases to be a director of the Company and (ii) in the event of an employee of the Company or a Subsidiary, upon his or her resignation from employment with the Company or a Subsidiary either (A) after the age of fifty-five (55) and the completion of ten (10) continuous years of service to the Company or a Subsidiary comprising at least twenty (20) hours per week or (B) after the age of sixty (60) and the completion of five (5) continuous years of service to the Company or a Subsidiary comprising at least twenty (20) hours per week. For purposes of this Agreement and for the sake of clarity, subject to execution of a release of claims in a form acceptable to the Company, the Participant may seek to re-characterize any termination of employment initiated by the Company, or a subsidiary of the Company, that is not a "termination for Cause" as a voluntary termination by reason of retirement, in which case the Participant shall not be entitled to receive any severance or other benefits that would have otherwise been provided by the Company to the Participant pursuant to any agreement between the Company and the Participant or any Company policy. Any such determination shall be made by the Committee in its sole discretion.

(f) Change in Control Event. If the Participant's employment or service is terminated by the Company or any Subsidiary without "Cause" (as defined below) or by the Participant for "Good Reason" (as defined in the Plan), in each case within 18 months following a Change in Control Event, this Option shall vest and become 100% exercisable upon the date of such termination of employment or service and the right to exercise this Option shall terminate one year following such date (but in no event after the Final Exercise Date).

4. Withholding. No Shares will be issued pursuant to the exercise of this Option unless and until the Participant pays to the Company, or makes provision satisfactory to the Company for payment of, any federal, state or local withholding taxes required by law to be withheld in respect of this Option in accordance with the instructions provided from time to time by the Company; provided, however, except as otherwise permitted by the Board, the total tax withholding where stock is being used to satisfy such tax obligations cannot exceed the Company's minimum statutory withholding obligations (based on minimum statutory withholding rates for federal and state tax purposes, including payroll taxes, that are applicable to such supplemental taxable income).

5. Nontransferability of Option. This Option may not be sold, assigned, transferred, pledged or otherwise encumbered by the Participant, either voluntarily or by operation of law, except by will or the laws of descent and distribution, and, during the lifetime of the Participant, this Option shall be exercisable only by the Participant. Notwithstanding the foregoing, the Company consents to the gratuitous transfer of this Option by the Participant to or for the benefit of any immediate family member, family trust or family partnership established solely for the benefit of the Participant and/or an immediate family member thereof; provided that with respect to such proposed transferee the Company would be eligible to use a Form S-8 for the registration of the sale of the Common Stock subject to such Option under the Securities Act of 1933, as amended; and provided further that the Company shall not be required to recognize any such transfer until such time as the Participant and such permitted transferee shall, as a condition to such transfer, deliver to the Company a written instrument in form and substance satisfactory to the Company confirming that such transferee shall be bound by all of the terms and conditions of this Agreement.

6. Provisions of the Plan. This Option is subject to the provisions of the Plan, a copy of which is furnished to the Participant with this Option.

7. No Right To Employment or Other Status. The grant of this Option shall not be construed as giving the Participant the right to continued employment or any other relationship with the Company or Subsidiary. The Company and Subsidiaries expressly reserve the right at any time to dismiss or otherwise terminate its relationship with the Participant free from any liability or claim under the Plan or this Agreement, except as expressly provided herein.

8. Clawback. In accepting this Option, the Participant expressly agrees to be bound by, and subject to, the following clawback policy and any clawback policy that the Company has in effect or may adopt in the future

(a) The Option is intended to align the Participant's long-term interests with those of the Company. Accordingly, subject to Addendum A and unless otherwise expressly provided in

the Plan or any other applicable agreement, plan, or policy, and to the extent permitted by applicable law, the Company may terminate any unsettled portion of the Option, whether vested, unvested or unexercised (“Termination”), recapture any Shares acquired pursuant to the Option (“Recapture”), or require the Participant to reimburse the Company for any and all amounts realized from the acquisition or disposition of Shares acquired pursuant to the Option (“Reimbursement”), upon the occurrence of any of the following events (collectively, the “Conditions”):

(i) the Participant has engaged in misuse of the Company’s confidential information and/or conduct in breach of any (A) confidentiality obligation to the Company under any agreement between the Company and the Participant, or any policy or plan of the Company, including but not limited to, the Company’s standard form of Information and Invention Agreement applicable to such Participant, or (B) applicable noncompetition or nonsolicitation obligation to the Company under any applicable agreement between the Company and the Participant, or any policy or plan of the Company, including but not limited to the Company’s standard form of Noncompetition Agreement applicable to such Participant;

(ii) the Participant has been terminated for willfully engaging in illegal conduct or gross misconduct which is materially and demonstrably injurious to the Company (“Cause”). For purposes of the foregoing, no act or failure to act by the Participant shall be considered “willful” unless it is done or omitted to be done, in bad faith and without reasonable belief that the Participant’s action or omission was in the best interests of the Company; or

(iii) during his or her employment, the Participant (A) has rendered services to or otherwise directly or indirectly engaged in or assisted, any organization or business that, in the judgment of the Company in its sole and absolute discretion, is against the interest of the Company or one of its Affiliates; or (B) has engaged in activities that are materially prejudicial to or in conflict with the interests of the Company, including any breaches of fiduciary duty or the duty of loyalty.

For purposes of this Section 8, “Option Benefits” shall mean any and all amounts realized from the acquisition or disposition of Shares acquired pursuant to the Option, including any sales proceeds and/or dividends.

(b) Prior to the issuance of any Shares upon settlement of the Option pursuant to this Agreement, the Participant shall, if requested in writing by the Company, certify on a form acceptable to the Company that the Participant is in compliance with the terms and conditions of this Agreement and with the obligations contained in the Plan, or any other relevant agreement, plan, or contract listed in Section 8(a).

(c) Within ten (10) calendar days after receiving notice from the Company of any such activity described in Section 8(a) of this Agreement, the Participant shall either deliver to the Company the applicable Shares or make a cash payment to the Company equal to the Option Benefits. For purposes of the Company’s exercise of its Recapture and/or Reimbursement rights hereunder, the Participant expressly and explicitly authorizes the Company to issue instructions, on the Participant’s behalf, to any other brokerage firm and/or third-party administrator engaged

by the Company to hold Shares and other amounts acquired under the Plan to re-convey, transfer or otherwise return such Shares and/or other amounts to the Company.

(d) Notwithstanding the foregoing provisions of this Section 18, the Company may, in its sole and absolute discretion, choose to refrain from exercising its rights of Termination, Recapture and/or Reimbursement with respect to any particular act of the Participant or with respect to any other participant in the Plan, and its determination to refrain from exercising such rights shall not in any way reduce or eliminate the Company's authority to exercise its rights of Termination, Recapture and/or Reimbursement with respect to any other act of the Participant. Nothing in this Section 8 shall be construed to impose obligations on the Participant to refrain from engaging in lawful competition with the Company after the termination of employment that does not violate the Conditions, other than any obligations that are part of any applicable separate agreement between the Company and the Participant or that arise under applicable law.

Notwithstanding anything to the contrary in the Plan or this Agreement, the Company shall not seek to exercise its rights of Termination, Recapture or Reimbursement relating to any Options that were settled more than twelve (12) months prior to the date of the Participant's act or omission set forth in Section 8(a). All Options shall be subject to the Company's rights of Termination, Recapture and/or Reimbursement to the extent required by applicable law, including but not limited to Section 10D of the Securities Exchange Act of 1934.

9. Governing Law. Except as provided in Addendum A, this Agreement shall be governed by and interpreted in accordance with the laws of the State of Delaware without regard to any applicable conflicts of laws and in the event of a dispute related to or arising out of this Agreement, the parties submit to the exclusive jurisdiction and venue of the Delaware federal and Chancery Courts.

10. Affirmative Acceptance of Award. As a condition to the grant of this Option, the Participant must affirmatively accept this Option and Agreement by logging onto Fidelity's website at www.netbenefits.fidelity.com and completing the acceptance procedures reflected therein by no later than one day prior to the First Vesting Date (the "Award Acceptance Deadline"). If the Participant fails to accept this Option and Agreement by the Award Acceptance Deadline, this Award automatically will be forfeited and immediately terminate without any further action by the parties.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, the Company has caused this Option to be executed under its corporate seal by its duly authorized officer. This Option shall take effect as a sealed instrument.

THERMO FISHER SCIENTIFIC INC.

Dated: _____

By: _____

Name: _____

Title: _____

Addendum A

1. Massachusetts.

For Participants domiciled in the State of Massachusetts, the following language shall be added to Section 8(a)(i) of this Agreement:

Notwithstanding Section 9 of this Agreement, for any Termination, Recapture, and/or Reimbursement that is based, in whole or in part, on the Participant's breach of a noncompete agreement or nonsolicitation obligation, such disputes shall be governed by and interpreted in accordance with the laws of the State of Massachusetts, and any dispute arising out of the Agreement shall be asserted exclusively in the federal or state courts located in or covering the county in which the employee resides within the State of Massachusetts, and the Parties hereby submit to the personal jurisdiction and venue of those state and federal courts.

2. California.

For Participants domiciled in the State of California, Section 8(a)(i)(B) of this Agreement shall not apply except to the extent a noncompetition and/or non-solicitation agreement exists and is subject to California Business & Professions Code section 16601 *et seq.*

Form as of 2/25/20

THERMO FISHER SCIENTIFIC INC.

PERFORMANCE RESTRICTED STOCK UNIT AGREEMENT

Granted Under the [Name of Equity Incentive Plan]

1. Award of Restricted Stock Units.

This agreement (the "Agreement") sets forth the terms and conditions of an award by Thermo Fisher Scientific Inc., a Delaware corporation (the "Company"), on _____ (the "Award Date") to Marc N. Casper (the "Participant") of _____ restricted stock units of the Company (individually, an "RSU" and collectively, the "RSUs" or the "Award"). Each RSU represents the right to receive one share of common stock, \$1.00 par value, of the Company ("Common Stock") pursuant to the terms, conditions and restrictions set forth in this Agreement and in the Company's [Name of Equity Incentive Plan] (the "Plan"). The shares of Common Stock that are issuable upon vesting of the RSUs are referred to in this Agreement as Shares and the number of RSUs shown above is referred to as the "Target Award." Capitalized terms used in this Agreement and not otherwise defined shall have the same meaning as in the Plan.

2. Vesting Schedule.

Except as otherwise provided in paragraphs (b) through (f) of Section 3, the RSUs shall vest in accordance with Schedule A attached hereto and incorporated herein provided that on each Vesting Date (as defined in Schedule A), the Participant is, and has been at all times since the Award Date, an employee, officer or director of, or consultant or advisor to, the Company or any other entity the employees, officers, directors, consultants, or advisors of which are eligible to receive restricted stock awards under the Plan (an "Eligible Participant").

3. Additional Vesting Provisions.

(a) Termination of Relationship with the Company. In the event that the Participant ceases to be an Eligible Participant for any reason other than those set forth in paragraphs (b) through (f) below before the Final Vesting Date (as defined in Schedule A), the RSUs that have not previously vested shall be immediately forfeited to the Company.

(b) Death or Disability. In the event that the Participant's employment with the Company or a Subsidiary is terminated by reason of death or "disability" (as defined below) prior to the Performance Certification Date (as defined in Schedule A), 50% of the Target Award shall vest upon the date of such termination. In the event that such termination occurs on or after the Performance Certification Date but prior to the Final Vesting Date, 50% of the remaining unvested RSUs (based on the number of RSUs determined on the Performance Certification Date to be eligible to be received) shall vest upon the date of such termination, and the remaining RSUs shall be forfeited. For the purposes of this Agreement, a Participant shall be deemed to be

"disabled" at such time as the Participant is receiving disability benefits under the Company's Long Term Disability Coverage, as then in effect.

(c) Discharge without Cause or for Good Reason. In the event that the Participant's employment or service is terminated by the Company or any Subsidiary after the last day of the Company's fiscal quarter in which this Award was granted, and prior to the Performance Certification Date without "Cause" (as defined in Section 1.2 of the 2009 Restatement of Executive Severance Agreement between the Company and the Participant dated November 21, 2009, as may be amended from time to time (the "Severance Agreement")) or by the Participant for Good Reason (as defined in Section 1.4 of the Severance Agreement), and such termination does not entitle the Participant to severance benefits under the Executive Change in Control Retention Agreement between the Company and the Participant dated November 21, 2009, as may be amended from time to time (the "CIC Agreement"), and provided that the performance conditions (assuming the last day of the performance period was the last day of the prior fiscal quarter) are actually achieved and the Compensation Committee has certified the achievement of the performance conditions, then 1/3 of the RSUs shall vest immediately. In the event of such termination on or after the Performance Certification Date but prior to the Final Vesting Date, then the RSUs that are scheduled to vest on the next Vesting Date (based on the number of RSUs determined on the Performance Certification Date to be eligible to be received) shall vest upon the date of such termination, and the remaining RSUs shall be forfeited.

(d) Discharge for Cause. In the event that the Participant is discharged by the Company or a Subsidiary for "Cause" (as defined in Section 1.2 of the Severance Agreement), all unvested RSUs and all vested RSUs that have not been delivered in accordance with Section 4 below shall terminate immediately upon the effective date of such discharge. The Participant shall be considered to have been discharged for Cause if the Company determines, within 30 days after the Participant's resignation, that discharge for Cause was warranted.

(e) Termination by Participant without Good Reason. In the event that the Participant terminates his employment with the Company or a Subsidiary without "Good Reason" (as defined in Section 1.4 of the Severance Agreement or Section 1.4 of the CIC Agreement, as applicable), all unvested RSUs shall terminate immediately upon the effective date of such termination and all vested RSUs that have not been delivered in accordance with Section 4 below shall be delivered immediately.

(f) Change in Control Event. In the event that the Participant's employment or service is terminated by the Company or any Subsidiary without "Cause" (as defined in Section 1.3 of the CIC Agreement) or by the Participant for Good Reason (as defined in Section 1.4 of the CIC Agreement), within 18 months after a Change in Control Event that occurs prior to the Performance Certification Date, and such termination entitles the Participant to severance benefits under the CIC Agreement, then all unvested RSUs shall vest immediately, provided that the performance conditions (assuming the last day of the performance period was the last day of the fiscal quarter immediately prior to the Change in Control Event) are actually achieved (without regard to performance for any periods following the last day of the fiscal quarter immediately prior to the Change in Control Event) and the Compensation Committee has certified the achievement of the performance conditions. In the event of such termination on or after the Performance Certification Date but before the Final Vesting Date, then all unvested

RSUs (based on the number of RSUs determined on the Performance Certification Date to be eligible to be received) shall vest upon the date of such termination.

4. Delivery of Shares

(a) The Company shall deliver the Shares that become issuable upon the vesting of an RSU (i) to the Participant as soon as administratively practicable or (ii) in the event that the Participant's employment with the Company is terminated by reason of death, to the Participant's estate as soon as administratively practicable, but in no event later than the last day of the period specified in Treas. Reg. section 1.409A-1(b)(4)(i)(A).

(b) The Company shall not be obligated to deliver Shares to the Participant unless the issuance and delivery of such Shares shall comply with all relevant provisions of law and other legal requirements including, without limitation, any applicable federal or state securities laws and the requirements of any stock exchange upon which shares of Common Stock may then be listed.

5. Restrictions on Transfer.

The Participant shall not sell, assign, transfer, pledge, hypothecate or otherwise dispose of, by operation of law or otherwise (collectively "transfer") any RSUs, or any interest therein, except by will or the laws of descent and distribution. Upon delivery of Shares pursuant to Section 4 above, the Participant for two years thereafter shall not transfer more than 50% of the actual net Shares delivered (after withholding for the payment of taxes); provided, however, that this restriction shall not apply to a termination of Participant's employment under paragraphs (b), (c), (e) or (f) of Section 3 above. The Participant acknowledges that any stock certificates or other evidence of ownership of RSUs or Shares may bear a restrictive legend evidencing any applicable transfer restrictions.

6. Provisions of the Plan.

This Agreement is subject to the provisions of the Plan, a copy of which is furnished to the Participant with this Agreement.

7. Dividends; Other Corporate Transactions.

(a) If at any time during the period between the Performance Certification Date and the date that Shares are delivered after the RSU vests, the Company pays a dividend or other distribution with respect to its Common Stock, including without limitation a distribution of shares of the Company's stock by reason of a stock dividend, stock split or otherwise, then on the date the Shares issuable upon vesting of the RSU are delivered, the Company shall pay the Participant the dividend or other distribution that would have been paid on such Shares if the Participant had owned such Shares during the period beginning on the Performance Certification Date and ending on the respective delivery date. No dividend or other distribution shall be paid with respect to RSUs that are forfeited.

(b) In the event of a Reorganization Event, then the rights of the Company under this Agreement and all other terms of this Agreement (including without limitation vesting provisions) shall inure to the benefit of the Company's successor and shall apply to the cash, securities or other property which the Common Stock was converted into or exchanged for pursuant to such Reorganization Event in the same manner and to the same extent as they applied to the Shares. Such cash, securities or other property shall be delivered or paid at the time provided in Section 4.

(c) Except as set forth in Section 7(a) or (b) above and in the Plan, neither the Participant nor any person claiming under or through the Participant shall be, or have any rights or privileges of, a stockholder of the Company in respect of the Shares issuable pursuant to the RSUs granted hereunder until the Shares have been delivered to the Participant.

8. Withholding Taxes; No Section 83(b) Election.

(a) The Participant expressly acknowledges that the delivery of Shares to the Participant will give rise to "wages" subject to withholding. Unless the Participant provides notice to the Company prior to the delivery of the Shares that the Participant will make payment to the Company on the date of delivery to satisfy all required withholding taxes, the Participant hereby authorizes the Company to hold back from the shares to be delivered pursuant to Section 4 of this Agreement of that number of shares calculated to satisfy all such federal, state, local or other applicable taxes required to be withheld in connection with such delivery of Shares; provided, however, that the total tax withholding where Shares are being used to satisfy such tax obligations cannot exceed the Company's minimum statutory withholding obligations (based on minimum statutory withholding rates for federal and state tax purposes, including payroll taxes, that are applicable to such wages).

(b) The Participant acknowledges that no election under Section 83(b) of the Code may be filed with respect to this Award.

9. No Right To Employment or Other Status. The grant of an award of RSUs shall not be construed as giving the Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with the Participant free from any liability or claim under the Plan or this Agreement, except as expressly provided herein.

10. Conflicts With Other Agreements. In the event of any conflict or inconsistency between the terms of this Agreement and any employment, severance or other agreement between the Company and the Participant, the terms of this Agreement shall govern.

11. Governing Law. This Agreement shall be governed by and interpreted in accordance with the laws of the State of Delaware without regard to any applicable conflicts of laws and in the event of a dispute related to or arising out of this Agreement, the parties submit to the exclusive jurisdiction and venue of the Delaware federal and Chancery Courts. Notwithstanding the foregoing, for any Termination (defined below), Recapture (defined below), and/or Reimbursement (defined below) that is based, in whole or in part, on the Participant's breach of a noncompete agreement or nonsolicitation obligation, such disputes shall be governed by and

interpreted in accordance with the laws of the State of Massachusetts, and any dispute arising out of this Agreement shall be asserted exclusively in the federal or state courts located in or covering the county in which the employee resides within the State of Massachusetts, and the parties hereby submit to the personal jurisdiction and venue of those state and federal courts.

12. Unfunded Rights. The right of the Participant to receive Common Stock pursuant to this Agreement is an unfunded and unsecured obligation of the Company. The Participant shall have no rights under this Agreement other than those of an unsecured general creditor of the Company.

13. Compliance with Section 409A of the Code. This Agreement is intended to provide for deferred compensation that is exempt from or compliant with Section 409A and shall be interpreted consistently with such intent. Accordingly, a Participant shall have no right to designate the taxable year of payment. Notwithstanding any other provision of this Agreement, if and to the extent any portion of any payment under this Agreement to the Participant is payable upon his or her separation from service and the Participant is a specified employee as defined in Section 409A(a)(2)(B)(i), as determined by the Company in accordance with its procedures, by which determination the Participant (through accepting the Award) agrees that he or she is bound, such portion of the payment, compensation or other benefit shall not be paid before the day that is six months plus one day after the date of "separation from service", except as Section 409A may then permit.

The Company makes no representations or warranty and shall have no liability to the Participant or any other person if any provisions of or payments, compensation or other benefits under this Agreement are determined to constitute nonqualified deferred compensation subject to Section 409A but do not to satisfy the conditions of that section.

14. Clawback. In accepting this Award, the Participant expressly agrees to be bound by, and subject to, the following clawback policy and any clawback policy that the Company has in effect or may adopt in the future:

(a) The Award is intended to align the Participant's long-term interests with those of the Company. Accordingly, unless otherwise expressly provided in the Plan or any other applicable agreement, plan, or policy, and to the extent permitted by applicable law, the Company may terminate any unsettled RSUs, whether vested or unvested ("Termination"), recapture any Shares acquired pursuant to the RSUs ("Recapture"), or require the Participant to reimburse the Company for any and all amounts realized from the acquisition or disposition of Shares acquired pursuant to the RSUs ("Reimbursement"), upon the occurrence of any of the following events (collectively, the "Conditions"):

(i) the Participant has engaged in misuse of the Company's confidential information and/or conduct in breach of any (A) confidentiality obligation to the Company under any agreement between the Company and the Participant, or any policy or plan of the Company, including but not limited to, the Company's standard form of Information and Invention Agreement applicable to such Participant, or (B) applicable noncompetition or nonsolicitation obligation to the Company under any applicable agreement between the Company and the

Participant, or any policy or plan of the Company, including but not limited to the Company's standard form of Noncompetition Agreement applicable to such Participant;

(ii) the Participant has been discharged by the Company or a Subsidiary for "Cause" (as defined in Section 1.2 of the Severance Agreement); or

(iii) during his or her employment, the Participant (A) has rendered services to or otherwise directly or indirectly engaged in or assisted, any organization or business that, in the judgment of the Company in its sole and absolute discretion, is against the interest of the Company or one of its Affiliates; or (B) has engaged in activities that are materially prejudicial to or in conflict with the interests of the Company, including any breaches of fiduciary duty or the duty of loyalty.

For purposes of this Section 14, "RSU Benefits" shall mean any and all amounts realized from the acquisition or disposition of Shares acquired pursuant to the RSUs, including any sales proceeds, dividends and/or dividend equivalents.

(b) Prior to the issuance of any Shares upon settlement of vested RSUs pursuant to this Agreement, the Participant shall, if requested in writing by the Company, certify on a form acceptable to the Company that the Participant is in compliance with the terms and conditions of this Agreement and with the obligations contained in the Plan, or any other relevant agreement, plan, or contract listed in Section 14(a).

(c) Within ten (10) calendar days after receiving notice from the Company of any such activity described in Section 14(a) of this Agreement, the Participant shall either deliver to the Company the applicable Shares or make a cash payment to the Company equal to the RSU Benefits. For purposes of the Company's exercise of its Recapture and/or Reimbursement rights hereunder, the Participant expressly and explicitly authorizes the Company to issue instructions, on the Participant's behalf, to any brokerage firm and/or third-party administrator engaged by the Company to hold Shares and other amounts acquired under the Plan to re-convey, transfer or otherwise return such Shares and/or other amounts to the Company.

(d) Notwithstanding the foregoing provisions of this Section 14, the Company may, in its sole and absolute discretion, choose to refrain from exercising its rights of Termination, Recapture and/or Reimbursement with respect to any particular act of the Participant or with respect to any other participant in the Plan, and its determination to refrain from exercising such rights shall not in any way reduce or eliminate the Company's authority to exercise its rights of Termination, Recapture and/or Reimbursement with respect to any other act of the Participant. Nothing in this Section 14 shall be construed to impose obligations on the Participant to refrain from engaging in lawful competition with the Company after the termination of employment that does not violate the Conditions, other than any obligations that are part of any applicable separate agreement between the Company and the Participant or that arise under applicable law.

(e) Notwithstanding anything to the contrary in the Plan or this Agreement, the Company shall not seek to exercise its rights of Termination, Recapture or Reimbursement relating to any RSUs that were vested and settled more than twelve (12) months prior to the date of the Participant's act or omission set forth in Section 14(a). All RSUs shall be subject to the

Company's rights of Termination, Recapture and/or Reimbursement to the extent required by applicable law, including but not limited to Section 10D of the Securities Exchange Act of 1934.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

THERMO FISHER SCIENTIFIC INC.

By:

Marc N. Casper

Form as of 2/25/20 (Marc Casper)

THERMO FISHER SCIENTIFIC INC.
RESTRICTED STOCK UNIT AGREEMENT

Granted Under
the [Name of Equity Incentive] Plan

1. Award of Restricted Stock Units.

This agreement (the "Agreement") sets forth the terms and conditions of an award by Thermo Fisher Scientific Inc., a Delaware corporation, on _____ (the "Award Date") to Marc N. Casper (the "Participant") of _____ restricted stock units of the Company (individually, an "RSU" and collectively, the "RSUs" or the "Award"). Each RSU represents the right to receive one share of common stock, \$1.00 par value, of the Company ("Common Stock") pursuant to the terms, conditions and restrictions set forth in this Agreement and in the Company's [Name of Equity Incentive Plan] Plan (the "Plan"). The shares of Common Stock that are issuable in connection with the RSUs are referred to in this Agreement as Shares. Capitalized terms used in this Agreement and not otherwise defined shall have the same meaning as in the Plan.

2. Time-Based Vesting.

Except as otherwise provided in paragraphs (b) through (f) of Section 3, the RSUs shall vest as to 15% of the original number of RSUs on the date that is six months following the Award Date (the "First Vesting Date"), as to an additional 25% of the original number of RSUs on the first anniversary of the First Vesting Date (the "Second Vesting Date"), as to an additional 30% of the original number of RSUs on the second anniversary of the First Vesting Date (the "Third Vesting Date"), and as to an additional 30% of the original number of RSUs on the third anniversary of the First Vesting Date (the "Final Vesting Date" and each of the First Vesting Date, Second Vesting Date, Third Vesting Date and Final Vesting Date a "Vesting Date") provided that on each such Vesting Date, the Participant is, and has been at all times since the Award Date, an employee, officer or director of, or consultant or advisor to, the Company (an "Eligible Participant").

3. Additional Vesting Provisions.

(a) Termination of Relationship with the Company. In the event that the Participant ceases to be an Eligible Participant for any reason not described in paragraphs (b) through (f) below, RSUs that have not previously vested shall be immediately forfeited to the Company.

(b) Death or Disability. In the event that the Participant's employment with the Company or a Subsidiary is terminated by reason of death or "disability" (as defined below)

prior to the Final Vesting Date, 50% of the unvested RSUs shall vest upon the date of such termination due to death or disability, and the remaining RSUs shall be forfeited. For the purposes of this Agreement, a Participant shall be deemed to be "disabled" at such time as the Participant is receiving disability benefits under the Company's Long Term Disability Coverage, as then in effect.

(c) Discharge without Cause or for Good Reason. In the event that the Participant's employment or service is terminated by the Company or any Subsidiary without "Cause" (as defined in Section 1.2 of the 2009 Restatement of Executive Severance Agreement between the Company and the Participant dated November 21, 2009, as may be amended from time to time (the "Severance Agreement")) or by the Participant for Good Reason (as defined in Section 1.4 of the Severance Agreement), and such termination does not entitle the Participant to severance benefits under the Executive Change in Control Retention Agreement between the Company and the Participant dated November 21, 2009, as may be amended from time to time (the "CIC Agreement"), the RSUs that are scheduled to vest on the next Vesting Date will vest on such Vesting Date (and the Participant shall be deemed to have been an Eligible Participant up through such Vesting Date), and the remaining RSUs shall be forfeited.

(d) Discharge for Cause. In the event that the Participant is discharged by the Company or a Subsidiary for "Cause" (as defined in Section 1.2 of the Severance Agreement), all unvested RSUs and all vested RSUs that have not been delivered in accordance with Section 4 below shall terminate immediately upon the effective date of such discharge. The Participant shall be considered to have been discharged for Cause if the Company determines, within 30 days after the Participant's resignation, that discharge for Cause was warranted.

(e) Termination by Participant without Good Reason. In the event that the Participant terminates his employment with the Company or a Subsidiary without "Good Reason" (as defined in Section 1.4 of the Severance Agreement or Section 1.4 of the CIC Agreement, as applicable), all unvested RSUs shall terminate immediately upon the effective date of such termination and all vested RSUs that have not been delivered in accordance with Section 4 below shall be delivered immediately.

(f) Change in Control Event. In the event that the Participant's employment or service is terminated by the Company or any Subsidiary without "Cause" (as defined in Section 1.3 of the CIC Agreement) or by the Participant for Good Reason (as defined in Section 1.4 of the CIC Agreement) and such termination entitles the Participant to severance benefits under the CIC Agreement, then all unvested RSUs shall vest upon the date of such termination.

4. Delivery of Shares

(a) The Company shall deliver the Shares that become issuable pursuant to an RSU within the sixty (60) day period following the date the RSUs vest pursuant to Section 2 or 3 above.

(b) The Company shall not be obligated to deliver Shares to the Participant unless the issuance and delivery of such Shares shall comply with all relevant provisions of law and other legal requirements including, without limitation, any applicable federal or state securities laws

and the requirements of any stock exchange upon which shares of Common Stock may then be listed.

5. Restrictions on Transfer.

The Participant shall not sell, assign, transfer, pledge, hypothecate or otherwise dispose of, by operation of law or otherwise (collectively “transfer”) any RSUs, or any interest therein, except by will or the laws of descent and distribution. Upon delivery of Shares pursuant to Section 4 above, the Participant for two years thereafter shall not transfer more than 50% of the actual net Shares delivered (after withholding for the payment of taxes); provided, however, that this restriction shall not apply to a termination of Participant’s employment under paragraphs (b), (c), (e) or (f) of Section 3 above. The Participant acknowledges that any stock certificates or other evidence of ownership of RSUs or Shares may bear a restrictive legend evidencing any applicable transfer restrictions.

6. Provisions of the Plan.

This Agreement is subject to the provisions of the Plan, a copy of which is furnished to the Participant with this Agreement.

7. Dividends; Other Corporate Transactions.

(a) If at any time during the period between the Award Date and the date that Shares are delivered after the RSU vests, the Company pays a dividend or other distribution with respect to its Common Stock, including without limitation a distribution of shares of the Company’s stock by reason of a stock dividend, stock split or otherwise, then on the date the Shares issuable upon vesting of the RSU are delivered, the Company shall pay the Participant the dividend or other distribution that would have been paid on such Shares if the Participant had owned such Shares during the period beginning on the Award Date and ending on the respective delivery date. No dividend or other distribution shall be paid with respect to RSUs that are forfeited.

(b) In the event of a Reorganization Event, then the rights of the Company under this Agreement and all other terms of this Agreement (including without limitation vesting provisions) shall inure to the benefit of the Company's successor and shall apply to the cash, securities or other property which the Common Stock was converted into or exchanged for pursuant to such Reorganization Event in the same manner and to the same extent as they applied to the Shares. Such cash, securities or other property shall be delivered or paid at the time provided in Section 4.

(c) Except as set forth in Section 7(a) or (b) above and in the Plan, neither the Participant nor any person claiming under or through the Participant shall be, or have any rights or privileges of, a stockholder of the Company in respect of the Shares issuable pursuant to the RSUs granted hereunder until the Shares have been delivered to the Participant.

8. Withholding Taxes; No Section 83(b) Election.

(a) The Participant expressly acknowledges that the delivery of Shares to the Participant will give rise to "wages" subject to withholding. Unless the Participant provides notice to the Company prior to the delivery of the Shares that the Participant will make payment to the Company on the date of delivery to satisfy all required withholding taxes, the Participant hereby authorizes the Company to hold back from the shares to be delivered pursuant to Section 4 of this Agreement that number of shares calculated to satisfy all such federal, state, local or other applicable taxes required to be withheld in connection with such delivery of Shares; provided, however, that the total tax withholding where Shares are being used to satisfy such tax obligations cannot exceed the Company's minimum statutory withholding obligations (based on minimum statutory withholding rates for federal and state tax purposes, including payroll taxes, that are applicable to such wages).

(b) The Participant acknowledges that no election under Section 83(b) of the Code may be filed with respect to this Award.

9. No Right To Employment or Other Status. The grant of an award of RSUs shall not be construed as giving the Participant the right to continued employment or any other relationship with the Company. The Company expressly reserves the right at any time to dismiss or otherwise terminate its relationship with the Participant free from any liability or claim under the Plan or this Agreement, except as expressly provided herein.

10. Conflicts With Other Agreements. In the event of any conflict or inconsistency between the terms of this Agreement and any employment, severance or other agreement between the Company and the Participant, the terms of this Agreement shall govern.

11. Governing Law. This Agreement shall be governed by and interpreted in accordance with the laws of the State of Delaware without regard to any applicable conflicts of laws and in the event of a dispute related to or arising out of this Agreement, the parties submit to the exclusive jurisdiction and venue of the Delaware federal and Chancery Courts. Notwithstanding the foregoing, for any Termination (defined below), Recapture (defined below), and/or Reimbursement (defined below) that is based, in whole or in part, on the Participant's breach of a noncompete agreement or nonsolicitation obligation, such disputes shall be governed by and interpreted in accordance with the laws of the State of Massachusetts, and any dispute arising out of this Agreement shall be asserted exclusively in the federal or state courts located in or covering the county in which the employee resides within the State of Massachusetts, and the parties hereby submit to the personal jurisdiction and venue of those state and federal courts.

12. Unfunded Rights. The right of the Participant to receive Common Stock pursuant to this Agreement is an unfunded and unsecured obligation of the Company. The Participant shall have no rights under this Agreement other than those of an unsecured general creditor of the Company.

13. Compliance with Section 409A of the Code. This Agreement is intended to provide for deferred compensation that is exempt from or compliant with Section 409A and shall be interpreted consistently with such intent. Accordingly, a Participant shall have no right to designate the taxable year of payment. Notwithstanding any other provision of this Agreement, if and to the extent any portion of any payment under this Agreement to the Participant is

payable upon his or her separation from service and the Participant is a specified employee as defined in Section 409A(a)(2)(B)(i), as determined by the Company in accordance with its procedures, by which determination the Participant (through accepting the Award) agrees that he or she is bound, such portion of the payment, compensation or other benefit shall not be paid before the day that is six months plus one day after the date of “separation from service”, except as Section 409A may then permit.

The Company makes no representations or warranty and shall have no liability to the Participant or any other person if any provisions of or payments, compensation or other benefits under this Agreement are determined to constitute nonqualified deferred compensation subject to Section 409A but do not satisfy the conditions of that section.

14. **Clawback.** In accepting this Award, the Participant expressly agrees to be bound by, and subject to, the following clawback policy and any clawback policy that the Company has in effect or may adopt in the future:

(a) The Award is intended to align the Participant’s long-term interests with those of the Company. Accordingly, unless otherwise expressly provided in the Plan or any other applicable agreement, plan, or policy, and to the extent permitted by applicable law, the Company may terminate any unvested RSUs, whether vested or unvested (“Termination”), recapture any Shares acquired pursuant to the RSUs (“Recapture”), or require the Participant to reimburse the Company for any and all amounts realized from the acquisition or disposition of Shares acquired pursuant to the RSUs (“Reimbursement”), upon the occurrence of any of the following events (collectively, the “Conditions”):

(i) the Participant has engaged in misuse of the Company’s confidential information and/or conduct in breach of any (A) confidentiality obligation to the Company under any agreement between the Company and the Participant, or any policy or plan of the Company, including but not limited to, the Company’s standard form of Information and Invention Agreement applicable to such Participant, or (B) applicable noncompetition or nonsolicitation obligation to the Company under any applicable agreement between the Company and the Participant, or any policy or plan of the Company, including but not limited to the Company’s standard form of Noncompetition Agreement applicable to such Participant;

(ii) the Participant has been discharged by the Company or a Subsidiary for “Cause” (as defined in Section 1.2 of the Severance Agreement); or

(iii) during his or her employment, the Participant (A) has rendered services to or otherwise directly or indirectly engaged in or assisted, any organization or business that, in the judgment of the Company in its sole and absolute discretion, is against the interest of the Company or one of its Affiliates; or (B) has engaged in activities that are materially prejudicial to or in conflict with the interests of the Company, including any breaches of fiduciary duty or the duty of loyalty.

For purposes of this Section 14, “RSU Benefits” shall mean any and all amounts realized from the acquisition or disposition of Shares acquired pursuant to the RSUs, including any sales proceeds, dividends and/or dividend equivalents.

(b) Prior to the issuance of any Shares upon settlement of vested RSUs pursuant to this Agreement, the Participant shall, if requested in writing by the Company, certify on a form acceptable to the Company that the Participant is in compliance with the terms and conditions of this Agreement and with the obligations contained in the Plan, or any other relevant agreement, plan, or contract listed in Section 14(a).

(c) Within ten (10) calendar days after receiving notice from the Company of any such activity described in Section 14(a) of this Agreement, the Participant shall either deliver to the Company the applicable Shares or make a cash payment to the Company equal to the RSU Benefits. For purposes of the Company's exercise of its Recapture and/or Reimbursement rights hereunder, the Participant expressly and explicitly authorizes the Company to issue instructions, on the Participant's behalf, to any brokerage firm and/or third-party administrator engaged by the Company to hold Shares and other amounts acquired under the Plan to re-convey, transfer or otherwise return such Shares and/or other amounts to the Company.

(d) Notwithstanding the foregoing provisions of this Section 14, the Company may, in its sole and absolute discretion, choose to refrain from exercising its rights of Termination, Recapture and/or Reimbursement with respect to any particular act of the Participant or with respect to any other participant in the Plan, and its determination to refrain from exercising such rights shall not in any way reduce or eliminate the Company's authority to exercise its rights of Termination, Recapture and/or Reimbursement with respect to any other act of the Participant. Nothing in this Section 14 shall be construed to impose obligations on the Participant to refrain from engaging in lawful competition with the Company after the termination of employment that does not violate the Conditions, other than any obligations that are part of any applicable separate agreement between the Company and the Participant or that arise under applicable law.

(e) Notwithstanding anything to the contrary in the Plan or this Agreement, the Company shall not seek to exercise its rights of Termination, Recapture or Reimbursement relating to any RSUs that were vested and settled more than twelve (12) months prior to the date of the Participant's act or omission set forth in Section 14(a). All RSUs shall be subject to the Company's rights of Termination, Recapture and/or Reimbursement to the extent required by applicable law, including but not limited to Section 10D of the Securities Exchange Act of 1934.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

THERMO FISHER SCIENTIFIC INC.

By: _____

Name:

Title:

Marc N. Casper

Form as of 2/25/20 (Marc Casper)

THERMO FISHER SCIENTIFIC INC.

NONSTATUTORY STOCK OPTION AGREEMENT

Granted Under
[Name of Equity Incentive Plan]

1. Grant of Option.

This agreement evidences the grant by Thermo Fisher Scientific Inc., a Delaware corporation (the "Company"), on _____ (the "Grant Date") to Marc N. Casper (the "Participant"), an employee and officer of the Company, of an Option to purchase, in whole or in part, on the terms provided herein and in the Company's [Name of Equity Incentive Plan] (the "Plan"), a total of _____ shares (the "Shares") of common stock, \$1.00 par value per share, of the Company ("Common Stock") at \$_____ per Share. Unless earlier terminated, this Option shall expire at 5:00 p.m., Eastern time, on _____ (the "Final Exercise Date").

It is intended that this Option evidenced by this agreement shall not be an incentive stock option as defined in Section 422 of the Code. Except as otherwise indicated by the context, the term "Participant", as used in this Option, shall be deemed to include any person who acquires the right to exercise this Option validly under its terms. Capitalized terms used in this Agreement and not otherwise defined shall have the same meaning as in the Plan.

2. Vesting Schedule. Except as otherwise provided in paragraphs (c) through (f) of Section 3 below and the Plan, this Option will become exercisable ("vest") as to 25% of the original number of Shares on the first anniversary of the Grant Date (the "First Vesting Date") and as to an additional 25% of the original number of Shares on each anniversary of the Grant Date following the first anniversary of the Grant Date until the fourth anniversary of the Grant Date provided that on each such vesting date, the Participant is, and has been at all times since the Grant Date, an employee, officer or director of, or consultant or advisor to, the Company (an "Eligible Participant"). The right of exercise shall be cumulative so that to the extent the Option is not exercised in any period to the maximum extent permissible it shall continue to be exercisable, in whole or in part, with respect to all Shares for which it is vested until the earlier of the Final Exercise Date or the termination of this Option under Section 3 hereof.

3. Exercise of Option.

(a) Form of Exercise. Each election to exercise this Option shall be in accordance with the instructions provided from time to time by the Company. The Participant may purchase less than the number of shares covered hereby, provided that no partial exercise of this Option may be for any fractional share.

(b) Termination of Relationship with the Company. If the Participant ceases to be an Eligible Participant for any reason, then, except as provided in paragraphs (c) through (f) below, the right to exercise this Option shall terminate three months after such cessation (but in no event after the Final Exercise Date), provided that this Option shall be exercisable only to the extent that the Participant was entitled to exercise this Option on the date of such cessation.

(c) Death or Disability. If the Participant's employment with the Company or a Subsidiary is terminated by reason of death or "disability" (as defined below) prior to the Final Exercise Date while he is an Eligible Participant, this Option shall vest and become 100% exercisable upon the date of such termination due to death or disability and the right to exercise this Option shall terminate one year following such date (but in no event after the Final Exercise Date). For the purposes of this Agreement, a Participant shall be deemed to be "disabled" at such time as the Participant is receiving disability benefits under the Company's Long Term Disability Coverage, as then in effect.

(d) Discharge Without Cause or for Good Reason. If the Participant's employment or service is terminated by the Company or any Subsidiary without "Cause" (as defined in Section 1.2 of the 2009 Restatement of Executive Severance Agreement between the Company and the Participant dated November 21, 2009, as may be amended from time to time (the "Severance Agreement")) or by the Participant for Good Reason (as defined in Section 1.4 of the Severance Agreement), and such termination does not entitle the Participant to severance benefits under the Executive Change in Control Retention Agreement between the Company and the Participant dated November 21, 2009, as may be amended from time to time (the "CIC Agreement") prior to the Final Exercise Date, the unvested portion of this Option shall vest as to the 25% tranche of this Option next scheduled to vest under this Agreement (the "Accelerated Option Shares"), and the Accelerated Option Shares shall become exercisable upon the date of such termination of employment or service, and the right to exercise this Option (including the Accelerated Option Shares) shall terminate two years following such date (but in no event after the Final Exercise Date).

(e) Discharge for Cause. If the Participant, prior to the Final Exercise Date, is discharged by the Company or a Subsidiary for "Cause" (as defined in Section 1.2 of the Severance Agreement), the right to exercise this Option shall terminate immediately upon the effective date of such discharge. The Participant shall be considered to have been discharged for Cause if the Company determines, within thirty (30) days after the Participant's resignation, that discharge for Cause was warranted.

(f) Change in Control Event. If the Participant's employment or service is terminated by the Company or any Subsidiary without "Cause" (as defined in Section 1.3 of the CIC Agreement) or by the Participant for Good Reason (as defined in Section 1.4 of the CIC Agreement) and such termination entitles the Participant to severance benefits under the CIC Agreement, this Option shall vest and become 100% exercisable upon the date of such termination of employment or service and the right to exercise this Option shall terminate two years following such date (but in no event after the Final Exercise Date).

4. Withholding. No Shares will be issued pursuant to the exercise of this Option unless and until the Participant pays to the Company, or makes provision satisfactory to the Company for

payment of, any federal, state or local withholding taxes required by law to be withheld in respect of this Option in accordance with the instructions provided from time to time by the Company; provided, however, except as otherwise permitted by the Board, the total tax withholding where stock is being used to satisfy such tax obligations cannot exceed the Company's minimum statutory withholding obligations (based on minimum statutory withholding rates for federal and state tax purposes, including payroll taxes, that are applicable to such supplemental taxable income).

5. Nontransferability of Option. This Option may not be sold, assigned, transferred, pledged or otherwise encumbered by the Participant, either voluntarily or by operation of law, except by will or the laws of descent and distribution, and, during the lifetime of the Participant, this Option shall be exercisable only by the Participant. Notwithstanding the foregoing, the Company consents to the gratuitous transfer of this Option by the Participant to or for the benefit of any immediate family member, family trust or family partnership established solely for the benefit of the Participant and/or an immediate family member thereof; provided that with respect to such proposed transferee the Company would be eligible to use a Form S-8 for the registration of the sale of the Common Stock subject to such Option under the Securities Act of 1933, as amended; and provided further that the Company shall not be required to recognize any such transfer until such time as the Participant and such permitted transferee shall, as a condition to such transfer, deliver to the Company a written instrument in form and substance satisfactory to the Company confirming that such transferee shall be bound by all of the terms and conditions of this Agreement.

6. Provisions of the Plan. This Option is subject to the provisions of the Plan, a copy of which is furnished to the Participant with this Option.

7. No Right To Employment or Other Status. The grant of this Option shall not be construed as giving the Participant the right to continued employment or any other relationship with the Company or Subsidiary. The Company and Subsidiaries expressly reserve the right at any time to dismiss or otherwise terminate its relationship with the Participant free from any liability or claim under the Plan or this Agreement, except as expressly provided herein.

8. Clawback. In accepting this Option, the Participant expressly agrees to be bound by, and subject to, the following clawback policy and any clawback policy that the Company has in effect or may adopt in the future

(a) The Option is intended to align the Participant's long-term interests with those of the Company. Accordingly, unless otherwise expressly provided in the Plan or any other applicable agreement, plan, or policy, and to the extent permitted by applicable law, the Company may terminate any unsettled portion of the Option, whether vested, unvested or unexercised ("Termination"), recapture any Shares acquired pursuant to the Option ("Recapture"), or require the Participant to reimburse the Company for any and all amounts realized from the acquisition or disposition of Shares acquired pursuant to the Option ("Reimbursement"), upon the occurrence of any of the following events (collectively, the "Conditions"):

(i) the Participant has engaged in misuse of the Company's confidential information and/or conduct in breach of any (A) confidentiality obligation to the Company under any agreement between the Company and the Participant, or any policy or plan of the Company, including but not limited to, the Company's standard form of Information and Invention Agreement applicable to such Participant, or (B) applicable noncompetition or nonsolicitation obligation to the Company under any applicable agreement between the Company and the Participant, or any policy or plan of the Company, including but not limited to the Company's standard form of Noncompetition Agreement applicable to such Participant;

(ii) the Participant has been discharged by the Company or a Subsidiary for "Cause" (as defined in Section 1.2 of the Severance Agreement); or

(iii) during his or her employment, the Participant (A) has rendered services to or otherwise directly or indirectly engaged in or assisted, any organization or business that, in the judgment of the Company in its sole and absolute discretion, is against the interest of the Company or one of its Affiliates; or (B) has engaged in activities that are materially prejudicial to or in conflict with the interests of the Company, including any breaches of fiduciary duty or the duty of loyalty.

For purposes of this Section 8, "Option Benefits" shall mean any and all amounts realized from the acquisition or disposition of Shares acquired pursuant to the Option, including any sales proceeds and/or dividends.

(b) Prior to the issuance of any Shares upon settlement of the Option pursuant to this Agreement, the Participant shall, if requested in writing by the Company, certify on a form acceptable to the Company that the Participant is in compliance with the terms and conditions of this Agreement and with the obligations contained in the Plan, or any other relevant agreement, plan, or contract listed in Section 8(a).

(c) Within ten (10) calendar days after receiving notice from the Company of any such activity described in Section 8(a) of this Agreement, the Participant shall either deliver to the Company the applicable Shares or make a cash payment to the Company equal to the Option Benefits. For purposes of the Company's exercise of its Recapture and/or Reimbursement rights hereunder, the Participant expressly and explicitly authorizes the Company to issue instructions, on the Participant's behalf, to any brokerage firm and/or third-party administrator engaged by the Company to hold Shares and other amounts acquired under the Plan to re-convey, transfer or otherwise return such Shares and/or other amounts to the Company.

(d) Notwithstanding the foregoing provisions of this Section 18, the Company may, in its sole and absolute discretion, choose to refrain from exercising its rights of Termination, Recapture and/or Reimbursement with respect to any particular act of the Participant or with respect to any other participant in the Plan, and its determination to refrain from exercising such rights shall not in any way reduce or eliminate the Company's authority to exercise its rights of Termination, Recapture and/or Reimbursement with respect to any other act of the Participant. Nothing in this Section 8 shall be construed to impose obligations on the Participant to refrain from engaging in lawful competition with the Company after the termination of employment that

does not violate the Conditions, other than any obligations that are part of any applicable separate agreement between the Company and the Participant or that arise under applicable law.

Notwithstanding anything to the contrary in the Plan or this Agreement, the Company shall not seek to exercise its rights of Termination, Recapture or Reimbursement relating to any Options that were settled more than twelve (12) months prior to the date of the Participant's act or omission set forth in Section 8(a). All Options shall be subject to the Company's rights of Termination, Recapture and/or Reimbursement to the extent required by applicable law, including but not limited to Section 10D of the Securities Exchange Act of 1934.

9. Governing Law. This Agreement shall be governed by and interpreted in accordance with the laws of the State of Delaware without regard to any applicable conflicts of laws and in the event of a dispute related to or arising out of this Agreement, the parties submit to the exclusive jurisdiction and venue of the Delaware federal and Chancery Courts. Notwithstanding the foregoing, for any Termination, Recapture, and/or Reimbursement that is based, in whole or in part, on the Participant's breach of a noncompete agreement or nonsolicitation obligation, such disputes shall be governed by and interpreted in accordance with the laws of the State of Massachusetts, and any dispute arising out of this Agreement shall be asserted exclusively in the federal or state courts located in or covering the county in which the employee resides within the State of Massachusetts, and the parties hereby submit to the personal jurisdiction and venue of those state and federal courts.

IN WITNESS WHEREOF, the Company has caused this Option to be executed under its corporate seal by its duly authorized officer. This Option shall take effect as a sealed instrument.

THERMO FISHER SCIENTIFIC INC.

By: _____

Name:

Title:

Participant: _____

Marc N. Casper

THERMO FISHER SCIENTIFIC INC. SUBSIDIARIES

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Thermo Fisher Scientific Operating Company LLC	Delaware	100
Thermo Fisher Scientific Senior Financing LLC	Delaware	100
Thermo Fisher Scientific (DE) Holding S.a.r.l.	Luxembourg	100
Laboratory Management Systems, Inc.	Delaware	100
Thermo Fisher Scientific Peru S.R.L. [1% by Fisher Clinical Services (Peru) LLC]	Peru	99
Thermo Fisher Scientific Malaysia Sdn. Bhd.	Malaysia	100
Thermo Fisher Scientific (Barbados) Holding, Limited	Barbados	100
Fisher Clinical Logistics LLC	Delaware	100
Fisher Clinical Services (Suzhou) Co., Ltd.	China	100
Fisher Clinical Services Limited Liability Company [1% by Thermo Fisher Scientific Inc.]	Russia	99
Fisher Clinical Services Japan K.K.	Japan	100
Fisher Clinical Services (Korea) Co., Ltd	Korea	100
TFLP LLC	Delaware	100
Cohesive Technologies Inc.	Delaware	100
Cohesive Technologies (UK) Limited	England	100
Thermo Hypersil-Keystone LLC	Delaware	100
Thermo Electron A/S	Denmark	100
TWX, LLC [22.5% by Thermo Scientific Portable Analytical Instruments Inc.]	Massachusetts	77.5
Thermo Fisher GP LLC	Delaware	100
Thermo Fisher Scientific C.V. [1% by TFLP LLC]	Netherlands	99
Phadia GmbH	Germany	100
Thermo Fisher Scientific (Australia) C.V. [.00009% by Thermo Fisher GP LLC]	Netherlands	99.99991
Thermo Dutch Holdings Limited Partnership [1% by Thermo Finland Holdings LLC]	England	99
Fisher Clinical Services Mexico, S. de R.L. de C.V. [1% by Fisher Clinical Services (Mexico) LLC]	Mexico	99
Fisher Clinical Services (Mexico) LLC	Delaware	100
D-finitive Technologies, Inc.	South Carolina	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Thermo Fisher Scientific Africa Proprietary Ltd	South Africa	100
Thermo Fisher Scientific Middle East Holdings Inc.	Delaware	100
Thermo Portable Holdings LLC	Delaware	100
TSP Holdings I LLC	Delaware	100
Thermo Scientific Portable Analytical Instruments Inc.	Delaware	100
Thermo Fisher Germany B.V.	Netherlands	100
NovaWave Technologies, Inc.	California	100
Thermo Fisher Re Ltd. [20% by Thermo Fisher Insurance Holdings Inc.]	Bermuda	80
Thermo Fisher RE I Corporation	Delaware	100
Thermo Fisher RE II Corporation	Delaware	100
Thermo Fisher Scientific Re Ltd.	Bermuda	100
Thermo Finland Holdings LLC	Delaware	100
Pelican Acquisition Corporation	Delaware	100
Priority Air Holdings Corp	Delaware	100
Priority Air Express, LLC	Delaware	100
Priority Air Express UK Limited	England	100
Priority Air Express Pte. Ltd.	Singapore	100
PAX – DSI Acquisition LLC	Delaware	100
Distribution Solutions International, Inc.	Michigan	100
Thermo EGS Gauging LLC	Delaware	100
EGS Gauging Technical Services Company	Delaware	100
EGS Gauging Ltd.	England	100
Thermo Asset Management Services Inc.	Delaware	100
Thermo CRS Holdings Ltd.	Canada	100
Thermo CRS Ltd. [Series 1 Preferred Shares held by Oxoid Company, Diagnostix Ltd. and Thermo Fisher Scientific (Mississauga) Inc.]	Canada	100
Robocon Labor- und Industrieroboter Gesellschaft m.b.H	Austria	100
Thermo Fisher Scientific West Palm Holdings LLC	Delaware	100
Thermo Electron North America LLC	Delaware	100
picoSpin, LLC	Colorado	100
Loftus Furnace Company	Pennsylvania	100
NAPCO, Inc.	Connecticut	100
Fisher Clinical Services (Colombia) LLC	Delaware	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Fisher Clinical Services Colombia S.A.S.	Colombia	100
Fisher Clinical Services (Peru) LLC	Delaware	100
Fisher Clinical Services Peru S.R.L [1% by Thermo Fisher Scientific Inc.]	Peru	99
Fisher Servicios Clinicos (Chile) LLC	Delaware	100
Fisher Servicios Clinicos Chile Ltda [1% by Thermo Fisher Scientific Inc.]	Chile	99
Staten Island Cogeneration Corporation	New York	100
Doe & Ingalls Investors, Inc.	Delaware	100
Doe & Ingalls Management, LLC [47% by Thermo Fisher Scientific Inc.]	Delaware	53
Doe & Ingalls of California Operating LLC	North Carolina	100
Doe & Ingalls of Florida Operating LLC	Florida	100
Doe & Ingalls of Maryland Operating LLC	North Carolina	100
Doe & Ingalls of Massachusetts Operating LLC	North Carolina	100
Doe & Ingalls of North Carolina Operating LLC	North Carolina	100
Doe & Ingalls Properties II, LLC	North Carolina	100
Doe & Ingalls Properties, LLC	North Carolina	100
Thermo Electron Export Inc.	Barbados	100
Thermo Fisher Scientific (Mexico City) LLC	Delaware	100
Odyssey Luxembourg Holdings S.C.S. [1% by Odyssey Holdings LLC]	Luxembourg	99
Fisher Worldwide Gene Distribution SPV	Cayman Islands	100
Thermo Fisher Scientific Odyssey Financing (Barbados) SRL	Barbados	100
Thermo Fisher Scientific Odyssey Holdings Limited	England	100
Odyssey Venture Corporation	Delaware	100
Thermo Fisher Scientific Luxembourg Venture Holdings I S.a.r.l.	Luxembourg	100
Thermo Fisher Scientific Luxembourg Venture Holdings II S.a.r.l.	Luxembourg	100
Odyssey Holdings Corporation	Delaware	100
One Lambda, Inc	California	100
Linkage Biosciences, Inc.	California	100
Linkage Biosciences, S.a.r.l.	Switzerland	100
Odyssey Luxembourg IP Holdings 1 S.à r.l.	Luxembourg	100
Odyssey Luxembourg IP Holdings 2 S.à r.l.	Luxembourg	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Thermo Foundation, Inc.	Massachusetts	100
Thermo Fisher Financial Services Inc.	Delaware	100
Thermo Fisher Scientific Chemicals Inc.	Delaware	100
Russell pH Limited	Scotland	100
Thermo Keytek LLC	Delaware	100
Thermo Finland Holdings MT2 B.V. [10% by Thermo Finland Holdings LLC]	Netherlands	90
Thermo Cayman Holdings Ltd. [21.26% by Thermo Cambridge Limited]	Cayman Islands	78.73
European Laboratory Holdings Limited	Ireland	100
Thermo Fisher Investments (Cayman) Ltd.	Cayman Islands	100
Thermo Fisher Scientific Investments (Luxembourg) II S.a.r.l.	Luxembourg	100
Thermo Fisher Investments (Cayman) LLC	Delaware	100
Thermo Suomi Holding B.V. [33.33% by Life Sciences International Holdings BV]	Netherlands	66.67
Thermo Fisher (Finland Holdings 2) LLC	Delaware	100
Thermo Fisher (Finland Holdings) Limited Partnership [.5% by Thermo Fisher (Finland Holdings 2) LLC]	England	99.5
Thermo Finland Holdings MT1 B.V. [.5% by Thermo Fisher (Finland Holdings 2) LLC]	Netherlands	99.5
Thermo Fisher Scientific Oy	Finland	100
Thermo Electron Manufacturing Limited	England	100
Thermo Nicolet Limited	England	100
Thermo Elemental Limited	England	100
Thermo Finnigan Limited	England	100
Thermo Hypersil Ltd	England	100
G V Instruments Limited	England	100
GV Instruments Inc	Delaware	100
GV Instruments Canada Ltd.	Canada	100
Thermo Fisher India Holding B.V. [6.13% by Thermo Fisher Scientific Inc., .68% by Thermo Gamma-Metrics LLC and 30.74% by Thermo Fisher Scientific (Asheville) LLC]	Netherlands	62.45
Thermo Fisher Scientific India Pvt Ltd [.00161 % by Thermo Fisher Scientific Inc., .00320% by Thermo Electron LED GmbH, 2.66891% by Phadia Holding AB, .00001% by Phadia AB, and 22.23825% by Dionex Corporation]	India	75.08802

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
JSC "Thermo Fisher Scientific"	Russia	100
Thermedics Detection de Argentina S.R.L. [10% by Thermo Ramsey LLC]	Argentina	90
Fisher Clinical Services Latin America S.R.L. [10% by Thermo Ramsey LLC]	Argentina	90
Thermo Detection de Mexico S. de R.L. de C.V. [.00815586% by Thermo Environmental Instruments LLC and .02975898% by Thermo Fisher Scientific (Mexico City) LLC]	Mexico	99.96208516
Thermo Fisher Scientific eCommerce Solutions, LLC	Delaware	100
Goring Kerr Detection Limited	England	100
Thermo Sentron Canada Inc. [10% by Thermo Fisher Scientific Inc.]	Canada	90
Thermo Ramsey S.A.	Spain	100
Thermo Ramsey LLC	Massachusetts	100
Thermo Fisher Project Cyprus LLC	Delaware	100
Thermo Fisher Scientific Brasil Instrumentos de Processo Ltda. [.01% by Thermo Ramsey LLC]	Brazil	99.99
IntegenX, Inc.	California	100
IntegenX Ltd	England	100
Thermo Re, Ltd.	Bermuda	100
Thermo Electron (Proprietary) Limited	South Africa	100
Odyssey Holdings LLC	Delaware	100
TFS Group Holding I LLC [12.51% by Thermo Luxembourg Holding LLC, 4.70% by Molecular BioProducts, Inc., 20.48% by Fisher Scientific Worldwide Inc., .37% by Fisher Clinical Services Inc., .70% by Liberty Lane Investment LLC, .15% by Fisher Scientific International LLC, 7.40% by Thermo Fisher Scientific Life Investments US Financing II LLC, 13.37% by Erie LP Holding LLC, preferred shares held by Thermo Fisher Scientific Life Investments US Financing I LLC, Fisher Scientific Worldwide Holdings I C.V., and Thermo Fisher Scientific Investments (Sweden) S.a.r.l.]	Delaware	40.32
Thermo Fisher Scientific Luxembourg Sweden Holdings I S.à r.l	Luxembourg	100
Thermo Fisher Scientific Life Investments IV S.a.r.l	Luxembourg	100
Thermo Fisher Scientific Life Investments Malta II Limited [.00001% by Thermo Fisher Scientific Life Investments Malta Holding I LLC and 8.82109% by Thermo Fisher Scientific Life Investments IV S.a.r.l.]	Malta	91.17891
Thermo Fisher Scientific Life Investments Malta Holding I LLC	Delaware	100
TFS Group Holding II LLC [12.39% by Thermo Fisher Scientific Life Investments C.V.]	Delaware	87.61

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
TFS Life Holding LLC [6.19% by Thermo Fisher Scientific Life Technologies Investment UK I Limited, .01% by Thermo Fisher Scientific Life Investments US Financing II LLC, preferred shares held by Thermo Fisher Scientific Investments (Sweden) S.a.r.l. and Thermo Fisher Scientific Sweden Holdings LLC]	Delaware	93.80
FSWH II LLC	Delaware	100
FSWH I LLC	Delaware	100
FSWH II C.V. [1.4695% by FSWH II LLC]	Netherlands	98.5305
Thermo Fisher Scientific Canada Financing 1 ULC	Canada	100
Thermo Fisher Scientific Senior Holdings LP [.01% held by Thermo Fisher Scientific Canada Financing 2 ULC]	Canada	99.99
690,000 Class A Life Technologies Inc. [109,472 Class B by Thermo Fisher Scientific Life Canada Holding ULC and by Fisher Scientific Company]	Canada	100
Thermo Fisher Scientific Canada Financing 2 ULC	Canada	100
Thermo Fisher (CN) Luxembourg Holding S.a.r.l.	Luxembourg	100
Thermo Fisher Scientific Panama I Cayman Ltd	Cayman Islands	100
Thermo Fisher Senior Canada Holdings LLC	Delaware	100
Thermo CN Luxembourg LLC	Delaware	100
Thermo Fisher Scientific (Finance I) S.a.r.l. [1.26% by Thermo Luxembourg Holding S.a.r.l.]	Luxembourg	98.74
Fisher Canada Holding ULC 1	Canada	100
Fisher Canada Holding ULC 2	Canada	100
Fisher CLP Holding Limited Partnership [2.65574447% by Fisher Canada Holding ULC 2]	Canada	97.34425553
Fisher Canada Holding ULC 3	Canada	100
Thermo Fisher Scientific Beteiligungsverwaltungs GmbH	Germany	100
Thermo Fisher Diagnostics Aps	Denmark	100
Phadia s.r.o. [1% by Phadia AB]	Czech Republic	99
Phadia Taiwan Inc.	Taiwan	100
Thermo Fisher Diagnostics Limited	England	100
Thermo Fisher Diagnostics K.K.	Japan	100
Thermo Fisher Diagnostics Austria GmbH	Austria	100
Thermo Fisher Diagnostics NV [.0016% by Thermo Fisher Diagnostics Limited]	Belgium	99.9984

	NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
	Thermo Fisher Diagnostics, Sociedade Unipessoal Lda	Portugal	100
	Thermo Fisher Diagnostics, S.L.U.	Spain	100
	Thermo Fisher Diagnostics Oy	Finland	100
	Fiberlite Centrifuge LLC	Delaware	100
	Fisher Canada Limited Partnership [1.14% by Fisher Canada Holding ULC 3]	Canada	98.86
	Thermo Fisher Scientific (CN) Limited Partnership [.01% by Fisher Canada Holding ULC 3]	Canada	99.99
	Fisher Scientific Company	Canada	100
	Patheon Inc.	Canada	100
	Patheon KK	Japan	100
	Patheon U.S. Holdings LLC	Delaware	100
	Thermo Fisher Scientific PNM Limited Liability Partnership [50% by Patheon Inc.]	England	50
	Thermo Fisher Scientific (PN-I) SRL	Barbados	100
	Thermo Fisher Scientific PNM S.a.r.l	Luxembourg	100
	Patheon I B.V.	Netherlands	100
	Patheon Cooperatief U.A. [1% by Patheon Finance LLC]	Netherlands	99
	Patheon Softgels B.V.	Netherlands	100
	Patheon Finance LLC	Delaware	100
	Patheon Holdings SAS	France	100
	Patheon France SAS	France	100
	Patheon International AG	Switzerland	100
	Patheon Italia S.p.A.	Italy	100
	Thermo Fisher Scientific (PN1) UK Ltd	England	100
	Patheon UK Limited	England	100
	Patheon Calculus Merger LLC	Delaware	100
	Patheon Puerto Rico, Inc.	Puerto Rico	100
Acquisitions	Patheon Puerto Rico Corporation	Puerto Rico	100
Corporation	CEPH International	Puerto Rico	100
	Patheon U.S. Holdings Inc.	Delaware	100
Services Inc.	Patheon Pharmaceuticals	Delaware	100
	Patheon Pharmaceuticals Inc.	Delaware	100

	NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Inc.	Patheon Banner U.S. Holdings	Delaware	100
	Patheon Softgels Inc.	Delaware	100
S.A. de Banner	Pharmacaps Mexicana C.V. [.2% by Patheon U.S. Holdings Inc.]	Mexico	99.8
	Thermo Fisher Scientific (PN) UK LLC	Delaware	100
	Patheon UK Pension Trustees Limited	England	100
LLC]	Thermo Fisher Scientific (PN) UK Limited Partnership [1% by Thermo Fisher Scientific (PN) UK	England	99
	Thermo Fisher Scientific FSUKHCO Financing (Barbados) SRL	Barbados	100
	Diagnostix Ltd.	Canada	100
	Fisher Scientific Oxoid Holdings Ltd.	England	100
	Oxoid Company	Canada	100
	Fisher Scientific Luxembourg S.a.r.l.	Luxembourg	100
	Perbio Science (Canada) Company	Canada	100
	Fisher Scientific UK Holding Company Limited	England	100
	Fisher Scientific Oy	Finland	100
	Fisher Scientific Norway AS	Norway	100
	Fisher Scientific A/S	Norway	100
	Doublecape Holding Limited	England	100
	I.Q. (BIO) Limited	England	100
	Oxoid (ELY) Limited	England	100
	Doublecape Limited	England	100
	Fisher Scientific Ireland Limited	Ireland	100
	Doe & Ingalls Limited	Ireland	100
	Fisher Scientific Holding U.K., Limited	England	100
	Fisher Scientific U.K., Limited	England	100
	Orme Scientific Limited	England	100
	FSUK Holdings Limited	England	100
	Sterilin Limited	England	100
	Fisher Scientific UK Holding Company 2	England	100
	Fisher Clinical Services U.K. Limited	England	100
	Fisher Clinical Services Pte Ltd.	Singapore	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Fisher Clinical Services (Beijing) Co., Ltd.	China	100
Fisher Scientific Europe Holdings B.V.	Netherlands	100
Perbio Science International Netherlands B.V.	Netherlands	100
Fisher Scientific The Hague III B.V. [35.00095% by Fisher Scientific Europe Holdings B.V.]	Netherlands	64.99905
Fisher Scientific The Hague IV B.V. [4.545% by Fisher Scientific The Hague I B.V.]	Netherlands	95.455
Acros Organics B.V.B.A. [.3333 by Fisher Scientific The Hague II B.V.]	Belgium	99.6667
Fisher Scientific AG [17.55% by Fisher Scientific S.A.S.]	Switzerland	82.45
Ecochem N.V. [.3333% by Fisher Scientific The Hague II B.V.]	Belgium	99.6667
Fisher Scientific The Hague V B.V.	Netherlands	100
Fisher Clinical Services GmbH	Switzerland	100
Limited Fisher BioPharma Services (India) Private Limited] [.315% by Fisher Clinical Services U.K.]	India	99.685
Fisher Scientific Ireland Investments Unlimited [.10% by Fisher Scientific Europe Holdings B.V.]	Ireland	99.90
Fisher Scientific of the Netherlands B.V.	Netherlands	100
Fisher Emergo B.V.	Netherlands	100
Fisher Scientific The Hague II B.V.	Netherlands	100
Fisher Scientific The Hague I B.V.	Netherlands	100
Fisher Scientific Jersey Island Limited	Jersey	100
Fisher Maybridge Holdings Limited	England	100
Maybridge Chemical Holdings Limited	England	100
Maybridge Limited	England	100
Maybridge Chemical Company Limited	England	100
Fisher Bioblock Holding II SNC [.99% by Fisher Scientific The Hague II BV]	France	99.01
Thermo Electron Holdings SAS [22.12% by Fisher Canada Limited Partnership]	France	77.88
Inel SAS	France	100
Inel Inc.	Delaware	100
Thermo Electron SAS	France	100
Thermo Electron LED S.A.S.	France	100

	NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
	Jouan Limited	England	100
	Thermo Electron Industries	France	100
	S.C.I. du 10 rue Dugay Trouin [2% by Thermo Electron Industries]	France	98
	Thermo Fisher Scientific Milano Srl [.05% by Thermo Electron Industries]	Italy	99.95
	Thermo Fisher Production et Services SAS	France	100
	Perbio Science France SAS	France	100
	Fisher Scientific S.A.S.	France	100
	Fisher Scientific SPRL [.1% by Fisher Bioblock Holding II SNC]	Belgium	99.9
	SCI Inno 92 [.0004% by Fisher Bioblock Holding II SNC]	France	99.9996
	Fisher Scientific S.L.	Spain	100
	Fisher Scientific, Unipessoal, Lda.	Portugal	100
Biotecnología e	Bonsai Technologies - Sistemas para Industria, Unipessoal Lda	Portugal	100
	Oxoid Holding SAS	France	100
	Thermo Fisher Diagnostics SAS	France	100
	Oxoid Senior Holdings Limited	England	100
	Oxoid UKH LLC	Delaware	100
	Oxoid 2000 Limited	England	100
	Oxoid Holdings Limited	England	100
	Oxoid International Limited	England	100
	Oxoid A/S	Denmark	100
	Oxoid Australia Pty. Limited	Australia	100
	OXOID CZ s.r.o. [1% by Oxoid Limited]	Czech Republic	99
	Thermo Fisher Diagnostics AS	Norway	100
	Thermo Fisher Diagnostics AB	Sweden	100
	Thermo Fisher Diagnostics AG	Switzerland	100
	Thermo Fisher Diagnostics B.V.	Netherlands	100
	Oxoid Inc.	Delaware	100
	Oxoid New Zealand Limited	New Zealand	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Oxoid N.V. [.01% by Oxoid Holdings Limited]	Belgium	99.99
Thermo Fisher Diagnostics S.p.A.	Italy	100
Oxoid Limited	England	100
Thermo Fisher (Heysham) Limited	England	100
Avocado Research Chemicals Limited	England	100
Thermo Fisher (Kandel) GmbH	Germany	100
G & M Procter Limited	Scotland	100
Oxoid Limited	Ireland	100
Oxoid Pension Trustees Limited	England	100
Thermo Fisher (CN-I) Luxembourg LLC	Delaware	100
Thermo Fisher (CN-II) Luxembourg LLC	Delaware	100
Thermo Fisher Scientific (PN-II) SRL	Barbados	100
Fisher Worldwide Distribution SPV	Cayman Islands	100
Thermo Fisher (CN) Luxembourg S.a.r.l.	Luxembourg	100
Thermo Fisher Scientific PN2 C.V. [1% by Thermo Fisher Scientific PN2 LLC]	Netherlands	99
Thermo Fisher Scientific PN2 LLC	Delaware	100
Thermo Fisher Scientific (PN) Austria Holding GmbH	Austria	100
Thermo Fisher Scientific (Panama) B.V.	Netherlands	100
Thermo Fisher Scientific (Panama) II B.V.	Netherlands	100
Thermo Fisher Scientific (Panama) Dutch LLC	Delaware	100
Patheon B.V.	Netherlands	100
Patheon Holdings B.V.	Netherlands	100
Patheon Holdings I B.V.	Netherlands	100
Patheon Holdings II B.V.	Netherlands	100
Thermo Cayman USC Ltd.	Cayman	100
Thermo USC I LLC	Delaware	100
Patheon Biologics Australia Pty Ltd	Australia	100
Patheon Biologics B.V.	Netherlands	100
Patheon Regensburg GmbH	Germany	100
Patheon Life Science Products International GmbH	Austria	100
Patheon I Holding GmbH	Austria	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Patheon Austria GmbH & Co. KG [0% by Patheon I Holding GmbH]	Austria	100
DPI Newco LLC	Delaware	100
Patheon Manufacturing Services LLC	Delaware	100
Patheon Development Services Inc.	Delaware	100
REP GBP I-B Blocker, Inc.	Delaware	100
Patheon Biologics LLC [24% by REP GBP I-B Blocker, Inc.]	Delaware	76
Patheon Biologics (NJ) LLC	Delaware	100
Patheon API Inc.	South Carolina	100
Patheon API Services Inc.	South Carolina	100
Patheon API Manufacturing Inc.	South Carolina	100
Greenville Service Company, Inc. [50% held privately]	Delaware	50
DSM Pharmaceutical Products, Inc.	Delaware	100
Percivia LLC [50% held privately]	Delaware	50
Thermo Fisher Insurance Holdings Inc.	Delaware	100
Perbio Science BVBA	Belgium	100
Thermo Fisher Insurance Holdings LLC [45.62% by Thermo Fisher Re Ltd.]	Delaware	54.38
Thermo Scientific Microbiology Sdn Bhd	Malaysia	100
Thermo Scientific Microbiology Pte Ltd.	Singapore	100
TFS FEI Holding LLC [16.41% by Thermo Fisher Scientific (Finance I) S.a.r.l.]	Delaware	83.59
Thermo Fisher Scientific Sweden Holdings S.a.r.l. [1% by Thermo Fisher Scientific Sweden Holdings LLC]	Luxembourg	99
FSII Sweden Holdings I AB	Sweden	100
FSII Sweden Holdings II AB	Sweden	100
Power Sweden Holdings I AB	Sweden	100
FSII Sweden Holdings AB	Sweden	100
Thermo Fisher Scientific Life Canada Holding ULC	Canada	100
Life Technologies Japan Ltd.	Japan	100
Pasteur U.S. Corporation	Delaware	100
Phadia US Market Holdings LLC	Delaware	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Life Technologies GmbH	Germany	100
Fermentas Sweden AB	Sweden	100
Fermentas UK Limited	England	100
Thermo Fisher Scientific GENEART GmbH	Germany	100
LTC Tech South Africa PTY Ltd.	South Africa	100
Power Sweden Holdings II AB	Sweden	100
Perbio Science AB	Sweden	100
Thermo Fisher Scientific PRB Malta Limited [.03997% by Thermo Fisher Scientific PRB LLC]	Malta	99.96003
Thermo Fisher Scientific PRB LLC	Delaware	100
Thermo Fisher Scientific PRB S.a.r.l.	Luxembourg	100
Thermo Fisher Scientific Investments (Luxembourg) S.a.r.l. [1% by FSII Sweden Holdings AB]	Luxembourg	99
Thermo Fisher Scientific CMN LLC	Delaware	100
Thermo Fisher Scientific Malta Holdings LLC	Delaware	100
Thermo Fisher Scientific Investments (Malta) Limited [.00000066% by Thermo Fisher Scientific Malta Holdings LLC]	Malta	99.9999934
Thermo Fisher Scientific Life Investments II S.à r.l.	Luxembourg	100
Thermo Fisher Scientific Life Investments US Financing II LLC [1% by Perbio Science Sweden Holdings AB]	Delaware	99
Life Technologies BPD AB	Sweden	100
Perbio Science Sweden Holdings AB	Sweden	100
Phadia Luxembourg Holdings S.a.r.l.	Luxembourg	100
Phadia Malta Holdings Limited [.00000045935% by Phadia Luxembourg Holdings S.a.r.l.]	Malta	99.9999954065
Fisher Scientific GTF AB	Sweden	100
Fisher Scientific Biotech Line ApS	Denmark	100
CB Diagnostics Holding AB	Sweden	100
CB Diagnostics I AB	Sweden	100
CB Diagnostics AB	Sweden	100
Sweden DIA (Sweden) AB	Sweden	100
Phadia Sweden AB	Sweden	100
Phadia Holding AB	Sweden	100
Phadia Diagnosticos Ltda [1% by Phadia AB]	Brazil	99

	NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
	Beijing Phadia Diagnostics Co Ltd	China	100
	Allergon AB	Sweden	100
Ltd	Nanjing WeiKangLe Trading Industrial Co	China	100
	Laboratory Specialties Proprietary Ltd.	South Africa	100
	Phadia AB	Sweden	100
	Phadia Real Property AB	Sweden	100
	Phadia US Inc.	Delaware	100
	Life Technologies BPD UK Limited	England	100
	Perbio Science UK Limited	England	100
	Perbio Science Invest AB	Sweden	100
	Perbio Science Nederland B.V.	Netherlands	100
	Perbio Science Projekt AB	Sweden	100
	Perbio Science Switzerland SA	Switzerland	100
	Thermo Fisher Scientific (Finance III) S.a.r.l.	Luxembourg	100
	Thermo Fisher (CN) Malta Holdings Limited [.0000001% by Thermo Fisher Scientific (Finance III) LLC]	Malta	99.9999999
	Thermo Fisher Scientific (Finance III) LLC	Delaware	100
	Thermo Fisher Scientific (Finance II) S.a.r.l.	Luxembourg	100
	Thermo Fisher CM II LLC	Delaware	100
	Thermo Fisher Scientific Falcon Senior Holdings Inc.	Delaware	100
	FEI Company	Oregon	100
	ASPEX Corporation	Pennsylvania	100
	FEI Korea Ltd.	Korea	100
	FEI Houston, Inc.	Delaware	100
	FEI Melbourne Pty Ltd.	Australia	100
	FEI Saudi Arabia LLC [10% by FEI Europe B.V.]	Saudi Arabia	90
	FEI Technologies, Inc.	Oregon	100
	FEI EFA, Inc.	Delaware	100
	Thermo Fisher Scientific FLC Hong Kong Limited	Hong Kong	100
	DCG Systems GmbH	Germany	100
	Thermo Fisher Scientific FLC B.V.	Netherlands	100
	Thermo Fisher Scientific B.V.	Netherlands	100
	Thermo Optek S.A.	Spain	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Thermo Fisher Scientific Finance Company BV	Netherlands	100
Thermo Quest S.A.	Spain	100
Thermo Fisher Scientific FLC II B.V.	Delaware	100
Thermo Fisher Scientific FLC II B.V.	Netherlands	100
FEI Global Holdings C.V. [1% by FEI Technologies, Inc.]	Netherlands	99
FEI Electron Optics International B.V.	Netherlands	100
Thermo Fisher (FEI) Ireland Ltd	Ireland	100
FEI Microscopy Solutions Ltd	Israel	100
FEI CPD B.V.	Netherlands	100
DCG Systems LLC	Delaware	100
DCG Systems C.V. [.01% by DCG Systems, LLC]	Netherlands	99.99
DCG Systems B.V.	Netherlands	100
FEI EFA International Pte. Ltd.	Singapore	100
DCG Systems G.K.	Japan	100
DCG Systems Korea Ltd.	Korea	100
FEI Company of USA (S.E.A.) Pte Ltd.	Singapore	100
FEI Europe B.V.	Netherlands	100
FEI Electron Optics B.V.	Netherlands	100
FEI Hong Kong Company Limited	Hong Kong	100
FEI Trading (Shanghai) Co., Ltd.	China	100
Thermo Fisher Scientific Brno s.r.o.	Czech Republic	100
FEI Asia Pacific Co., Ltd.	China	100
FEI Technology de Mexico S.A. de C.V. [2% by FEI Company]	Mexico	98
FEI Servicios de Nanotecnologia Ltda. [1% by FEI Europe B.V.]	Brazil	99
FEI UK Ltd.	England	100
FEI France SAS	France	100
FEI Italia Srl	Italy	100
FEI SAS	France	100
FEI Company Japan Ltd.	Japan	100
FEI Norway Holding AS	Norway	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
FEI Australia Pty Ltd	Australia	100
FEI Trondheim AS	Norway	100
Thermo Fisher Scientific Norway US Investments LLC	Delaware	100
Thermo Fisher Scientific Norway Holdings AS	Norway	100
Thermo Fisher Scientific Life Senior Holdings, Inc. [15.37% by Thermo Fisher Scientific Norway Holdings AS]	Delaware	84.63
Erie UK 1 LLC	Delaware	100
Thermo Fisher Scientific Invitrogen Financing (Barbados) SRL	Barbados	100
Invitrogen Holdings Ltd.	Scotland	100
Invitrogen Europe Limited	Scotland	100
Erie N2 LLC	Delaware	100
Erie N10 LLC	Delaware	100
Erie UK 4 Limited	England	100
Thermo Fisher Scientific AU II Limited	England	100
Erie Finance LLC	Delaware	100
Applied Biosystems International Inc.	Delaware	100
ABII 2 Limited	England	100
Remel Europe Limited	England	100
Erie N2 UK Limited	England	100
Life Technologies Corporation	Delaware	100
Thermo Fisher Scientific Life Technologies Israel Investment I Limited	England	100
Thermo Fisher Scientific Life Technologies Israel Investment II Limited	England	100
Thermo Fisher Israel Ltd.	Israel	100
STC Bio Manufacturing, Inc.	Illinois	100
HyClone International Trade (Tianjin) Co., Ltd	China	100
Invitrogen Argentina SA	Argentina	100
Invitrogen BioServices India Private Limited [1% by Invitrogen Holdings LLC]	India	99
Invitrogen IP Holdings, Inc.	Delaware	100
Ion Torrent Systems, Inc.	Delaware	100
Molecular Probes, Inc.	Oregon	100
Acoustic Cytometry Systems, Inc.	Delaware	100
Matrix MicroScience Inc.	Colorado	100
Gold Cattle Standard Testing Labs, Inc.	Texas	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Westover Scientific, Inc.	Washington	100
Kettlebrook Insurance Co. Ltd. [32.5% by Invitrogen Europe Limited]	Hawaii	67.5
Invitrogen Finance Corp.	Delaware	100
CellzDirect, Inc.	Delaware	100
Applied Biosystems, LLC	Delaware	100
NewcoGen PE, LLC	Delaware	100
BioTrove Corporation	Delaware	100
BioTrove International, Inc.	Delaware	100
Life Technologies Clinical Services Lab, Inc.	Delaware	100
Compendia Bioscience, Inc.	Michigan	100
AcroMetrix LLC	California	100
Ambion, Inc.	Delaware	100
CHK Holdings Inc.	Delaware	100
Applied Biosystems de Mexico S. de R.L. de C.V. [.002% by Applied Biosystems, LLC]	Mexico	99.998
Thermo Fisher Scientific (IVGN) Limited [.84% by Ambion, Inc.]	Hong Kong	99.16
Applied Biosystems B.V.	Netherlands	100
Life Technologies New Zealand Ltd.	New Zealand	100
Invitrogen Hong Kong Limited	Hong Kong	100
Life Technologies Limited [23.5% by Applied Biosystems BV]	Hong Kong	76.5
Life Technologies Holdings PTE Ltd.	Singapore	100
Affymetrix Biotech Shanghai Ltd	China	100
Affymetrix UK Ltd	England	100
Life Technologies Magyarorszag Kft	Hungary	100
Life Technologies Czech Republic s.r.o	Czech Republic	100
Life Technologies Polska Sp z.o.o. [.08% by Invitrogen Holdings LLC]	Poland	99.92
Life Technologies International B.V.	Netherlands	100
Life Technologies Europe B.V.	Netherlands	100
Prionics AG	Switzerland	100
Prionics Italia S.r.l.	Italy	100
Prionics USA Inc.	Delaware	100

	NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
	Prionics Lelystad B.V.	Netherlands	100
	Prionics France SAS	France	100
	Prionics Asia Ltd.	Hong Kong	100
	IDnostics AG	Switzerland	100
	Applied Biosystems Finance B.V.	Netherlands	100
	Life Technologies SA	Spain	100
	Stokes Bio Ltd.	Ireland	100
	Life Technologies s.r.o [2.1% by Applied Biosystems BV]	Slovakia	97.9
	Life Technologies AS	Norway	100
LLC	Life Technologies Norway Investments US	Delaware	100
	Nihon Dynal K.K. [40% held privately]	Japan	60
	Dynal Biotech Beijing Limited	China	100
	Life Technologies SAS	France	100
	Laboratoire Service International - L.S.I	France	100
	BAC BV	Netherlands	100
	BAC IP BV	Netherlands	100
	Thermo Fisher Scientific (IVGN) B.V.	Netherlands	100
	Thermo Fisher Scientific Life Tech Korea Holdings LLC	Delaware	100
Biocologia	Life Technologies Brasil Comercio e Industria de Produtos para Ltda [3.45% by Thermo Fisher CHK Holding LLC]	Brazil	96.55
	Thermo Fisher CHK Holding LLC	Delaware	100
	Invitrogen Holdings LLC	Delaware	100
(Shanghai) Co.,	Thermo Fisher Bioprocessing Research and Development Ltd.	China	100
	Invitrogen (Shanghai) Investment Co., Ltd.	China	100
	Thermo Fisher Scientific (Guangzhou) Co., Ltd	China	100
Holding LLC	Thermo Fisher Scientific Life Technologies Luxembourg	Delaware	100
Technologies UK Holding	Thermo Fisher Scientific Luxembourg Life S.à r.l	Luxembourg	100
Enterprise Holding	Thermo Fisher Scientific Life Technologies Limited	England	100
Enterprise Holdings	Thermo Fisher Scientific Luxembourg S.à r.l.	Luxembourg	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
	Delaware	100
Enterprises GP	Thermo Fisher Scientific Life Enterprises GP LLC Thermo Fisher Scientific Life Enterprises C.V. [.10% by Thermo Fisher Scientific Life LLC]	Netherlands 99.90
GP	Thermo Fisher Scientific Life International Holdings LLC	Delaware 100
Scientific	Thermo Fisher Scientific Life International Holdings I C.V. [.10% by Thermo Fisher Life International GP Holdings LLC]	Netherlands 99.90
Holdings	Thermo Fisher Scientific Life CV GP II LLC	Delaware 100
International Thermo S.a.r.l. Scientific	Thermo Fisher Scientific Life Holdings II C.V. [.55383943% by Fisher Scientific Life Investments IV and .00000004% by Thermo Fisher Life CV GP Holding II LLC]	Netherlands 99.44616054
NL	Thermo Fisher Scientific Life Holdings GP LLC	Delaware 100
by NL	Thermo Fisher Scientific Life Netherlands Holding C.V. [10% Thermo Fisher Scientific Life Holdings GP LLC]	Netherlands 90
Life UK I	Thermo Fisher Scientific Technologies Investment Limited	England 100
Scientific Fisher Technologies .53% Scientific LP]	Thermo Fisher Holdings (Cayman) I [49.21% by Thermo Scientific Life Investment I LLC and by Thermo Fisher Life Technologies Investments Holding	Cayman Islands 50.26
Scientific (Cayman) II	Thermo Fisher Holdings	Cayman Islands 100
Fisher Cayman LLC	Thermo Scientific Investments	Delaware 100

NAME		STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
II	Thermo Fisher Scientific (Luxembourg) S.a.r.l.	Luxembourg	100
Fisher LLC	Thermo Scientific (Cayman)	Delaware	100
	Invitrogen Trading (Shanghai) Co., Ltd.	China	100
	Life Technologies DaAn Diagnostic (Guangzhou) Co., Ltd. [42.5% held privately]	China	57.5
	Life Technologies Finance Ltd.	Scotland	100
	Thermo Fisher Scientific (Thailand) Co., Ltd.	Thailand	100
	Thermo Fisher Scientific Solutions LLC [20% by Thermo Fisher Scientific Life Tech Korea Holdings LLC]	Korea	80
	Applied Biosystems Trading (Shanghai) Company Ltd.	China	100
	Shanghai Life Technologies Biotechnology Co. Limited	China	100
	Applied Biosystems Taiwan LLC	Delaware	100
	Life Technologies Co., Ltd. [42.6% by Applied Biosystems BV]	Taiwan	57.4
	Life Technologies Chile SpA	Chile	100
	PE AG	Switzerland	100
	ZAO PE Biosystems	Russia	100
	Affymetrix, Inc	Delaware	100
	Affymetrix Japan K.K.	Japan	100
	Bender MedSystems GmbH	Austria	100
	eBioscience, Ltd	England	100
	eBioscience SAS	France	100
	Panomics, L.L.C.	California	100
	Panomics S.R.L.	Italy	100
	USB Corporation	Ohio	100
	Thermo Fisher Scientific Sweden Holdings LLC [2936% by Thermo Fisher Scientific Investments (Sweden) S.a.r.l.]	Delaware	99.7064
	Princeton Gamma-Tech Instruments LLC	Delaware	100
	TPI Real Estate Holdings LLC	Delaware	100
	Comtest Limited	England	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Thermo Electron Metallurgical Services, Inc.	Texas	100
ONIX Systems Inc.	Delaware	100
Thermo Process Instruments GP, LLC	Delaware	100
Thermo Process Instruments, L.P [.10% by Thermo Process Instruments GP, LLC]	Texas	99.90
Thermo Measuretech Canada Inc.	Canada	100
Onix Holdings Limited	England	100
CAC Limited	England	100
Thermo Measurement Ltd	England	100
Thermo Onix Limited	England	100
Thermo Electron Scientific Instruments LLC	Delaware	100
Thermo Fisher Scientific Japan Holdings I B.V.	Netherlands	100
Fuji Partnership [17.8184% by Thermo Fisher Scientific Japan Holdings II B.V. and 10.1634% by Thermo Fisher Scientific Japan Holdings III B.V.]	Japan	72.0182
TK Partnership (aka Silent Partnership) [44.66% by Thermo Fisher Scientific K.K.]	Japan	55.34
Thermo Fisher Scientific (NK) LLC	Delaware	100
Thermo Fisher Eurobonds Ltd.	Cayman Islands	100
Thermo Fisher Scientific LSI Financing (Barbados) SRL	Barbados	100
Thermo Fisher Scientific (Mississauga) Inc. [Thermo Finnigan LLC owns 100 Series A Preferred shares]	Canada	100
Life Sciences International Limited	England	100
Hybaid Limited	England	100
Equibio Limited	England	100
Thermo Optek Limited	England	100
Thermo Cambridge Limited	England	100
VG Systems Limited	England	100
Thermo Radiometrie Limited	England	100
Thermo Electron Limited	England	100
Thermo Electron Weighing & Inspection Limited	England	100
Thermo Sentron Limited	England	100
Thermo Allen Coding Limited	England	100
Thermo Electron (Management Services) Limited	England	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Life Sciences International Holdings BV	Netherlands	100
Bioanalysis Labsystems, S.A. [10% by Thermo Fisher Scientific B.V.]	Spain	90
Life Sciences International (Poland) SP z O.O	Poland	100
Thermo Ramsey Italia S.r.l.	Italy	100
Helmet Securities Limited	England	100
Life Sciences International LLC	Delaware	100
Thermo Fisher Scientific (Asheville) LLC	Delaware	100
Thermo Neslab LLC	New Hampshire	100
Thermo Fisher Scientific Japan Holdings II B.V.	Netherlands	100
Lab-Line Instruments, Inc.	Delaware	100
Thermo Scientific Services, Inc.	California	100
Thermo Fisher Scientific (Fuji) LLC	Delaware	100
Jouan LLC	Delaware	100
Thermo KeveX X-Ray LLC	Delaware	100
Thermo Gamma-Metrics LLC	Delaware	100
ThermoSpectra Limited	England	100
Thermo Fisher Scientific Cork Ltd	Ireland	100
Laser Analytical Systems, Inc.	California	100
Thermo Finnigan LLC	Delaware	100
TMOI Inc.	Delaware	100
Thermo Fisher Scientific (China) Holding Limited	England	100
TFS Singapore HK Limited	Hong Kong	100
Thermo Fisher Scientific NHK Limited	Hong Kong	100
Thermo Fisher Scientific TR Limited	Hong Kong	100
GmbH] Thermo Fisher Scientific Baltics UAB [18.24% by Thermo Fisher Scientific (IVGN) Limited and 3.86% by Oxoid Investments	Lithuania	77.90
Fermentas China Co., Ltd	China	100
Thermo Fisher Scientific BHK (I) Limited	Hong Kong	100
Thermo Fisher China Business Trust II [1% by Thermo Fisher Scientific BHK (II) Limited]	China	99
Thermo Fisher Scientific BHK (II) Limited	Hong Kong	100
Thermo Fisher Scientific (China-HK) Holding Limited	Hong Kong	100
Alfa Aesar (Hong Kong) Limited	Hong Kong	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Alfa Aesar (China) Chemical Co. Ltd.	China	100
Thermo Fisher Scientific (Shanghai) Instruments Co., Ltd.	China	100
Thermo Fisher Scientific (Suzhou) Instruments Co., Ltd	China	100
Thermo Fisher Scientific (China) Co., Ltd.	China	100
Thermo Fisher Scientific (Shanghai) Management Co., Ltd.	China	100
Thermo Fisher Scientific (Hong Kong) Limited	Hong Kong	100
Thermo Life Science International Trading (Tianjin) Co., Ltd.	China	100
Thermo Fisher Scientific SL	Spain	100
Thermo Fisher (Cayman) Holdings I Ltd.	Cayman Islands	100
Thermo Fisher (Gibraltar) Limited [50% by Thermo Fisher (Cayman) Holdings II Ltd.]	Gibraltar	50
Thermo Fisher (Gibraltar) II Limited	Gibraltar	100
Navaho Acquisition Corp.	Delaware	100
NanoDrop Technologies LLC	Delaware	100
Thermo Fisher (Cayman) Holdings II Ltd.	Cayman Islands	100
Thermo BioAnalysis LLC [5.1% by Life Sciences International Limited and 9.4% by Life Sciences International LLC]	Delaware	85.5
Thermo Fisher Scientific Senior Holdings Australia LLC	Delaware	100
Thermo LabSystems S.A.	Spain	100
Thermo Fisher German Holdings LLC	Delaware	100
Thermo Holding European Operations LLC	Delaware	100
Thermo DMA Inc.	Texas	100
Thermo BioAnalysis Limited	England	100
Thermo Fast U.K. Limited	England	100
Thermo Projects Limited	England	100
Thermo LabSystems Inc.	Massachusetts	100
InnaPhase Limited	England	100
InnaPhase, Inc.	Canada	100
Core Informatics, LLC	Connecticut	100
Core Informatics UK Ltd.	England	100
Thermo Environmental Instruments LLC	California	100
27 Forge Parkway LLC	Delaware	100
Thermo Electron (Calgary) Limited	Canada	100
Thermo Orion Inc.	Massachusetts	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Thermo Fisher Scientific Aquasensors LLC	Delaware	100
Thermo Electron Puerto Rico, Inc.	Puerto Rico	100
Thermo CIDTEC Inc.	New York	100
Thermo Power Corporation	Massachusetts	100
ACI Holdings Inc.	New York	100
Thermo Securities Corporation	Delaware	100
Thermo Eberline Holdings I LLC [49% by Thermo Fisher Scientific Inc.]	Delaware	51
Thermo Eberline Holdings II LLC	Delaware	100
Thermo Eberline LLC	Delaware	100
Thermo Instrument Controls de Mexico, S.A. de C.V. [2% by Thermo Fisher Scientific Inc.]	Mexico	98
ThermoLase LLC	Delaware	100
Trex Medical Corporation	Delaware	100
Fermentas Inc.	Maryland	100
TFS LLC	Massachusetts	100
Thermo Corporation	Delaware	100
Fisher Scientific GmbH	Germany	100
Fisher Scientific Germany Beteiligungs GmbH	Germany	100
Fisher Scientific, spol. S.r.o	Czech Republic	100
Fisher Scientific (Austria) GmbH	Austria	100
Thermo Fisher Scientific Germany BV & Co. KG [0% by Thermo Fisher Germany B.V.]	Germany	100
Fisher Clinical Services GmbH	Germany	100
Fisher Clinical Services Rheinfelden GmbH	Germany	100
Thermo Fisher Scientific (Holding II) B.V. & Co. KG [0% by Thermo Fisher Germany B.V.]	Germany	100
FEI Deutschland GmbH	Germany	100
Thermo Fisher Diagnostics GmbH	Germany	100
Microgenics Corporation	Delaware	100
Consolidated Technologies, Inc.	Wisconsin	100
Microgenics Diagnostics Pty Limited	Australia	100
Remel Inc.	Wisconsin	100
Trek Diagnostic Systems LLC	Delaware	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Trek Holding Company Ltd.	England	100
Trek Holding Company II Ltd.	England	100
Trek Diagnostic Systems Ltd.	England	100
Thermo Luxembourg Holding LLC	Delaware	100
Thermo MT II Limited [.0000003% by Thermo MT II LLC]	Malta	99.9999997
Thermo MT II LLC	Delaware	100
Thermo Luxembourg Holding S.a.r.l.	Luxembourg	100
Thermo Luxembourg U.S. S.a.r.l.	Luxembourg	100
Thermo Fisher Scientific Vector Senior Holdings II UAB	Lithuania	100
Thermo Fisher Scientific Vector Senior Holdings I UAB	Lithuania	100
Thermo Fisher Scientific Vector Holdings UAB	Lithuania	100
Thermo Fisher Scientific Vector Holdings LLC	Delaware	100
FB2 Blocker, LLC	Delaware	100
Brammer Bio Holding Company, LLC [43.18% by Thermo Fisher Scientific Vector Holdings LLC]	Delaware	56.82
Brammer Bio, LLC	Delaware	100
Brammer Bio MA, LLC	Delaware	100
Thermo Fisher Scientific Asset Management 1 GmbH	Germany	100
Thermo Fisher Scientific Asset Management 2 GmbH	Germany	100
Thermo Fisher Scientific Biosciences Corp.	Canada	100
Oxoid Investments GmbH	Germany	100
B.R.A.H.M.S. GmbH [5.025% by Thermo Fisher Scientific Beteiligungsverwaltungs GmbH]	Germany	94.975
B.R.A.H.M.S. Biotech GmbH [6% held privately]	Germany	94
Cezanne S.A.S.	France	100
HENO GmbH i.L.	Germany	100
B.R.A.H.M.S. UK Ltd	England	100
Thermo Fisher Scientific Luxembourg German Holdings S.a.r.l.	Luxembourg	100
Dionex (UK) Limited [.10% by Dionex Corporation]	England	99.90
Thermo Fisher Scientific Chromatography Holdings S.à r.l. [5.28% by Oxoid Investments GmbH]	Luxembourg	94.72
Thermo Fisher Scientific Chromatography Holdings Aps	Denmark	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Dionex Corporation	Delaware	100
Thermo Fisher Scientific Pte. Ltd.	Singapore	100
Dionex Sweden AB	Sweden	100
Dionex I, LLC	Delaware	100
Dionex (Switzerland) AG	Switzerland	100
Dionex Canada Ltd.	Canada	100
Dionex Austria GmbH	Austria	100
Dionex Benelux B.V.	Netherlands	100
Dionex Holding GmbH	Germany	100
Dionex Softron GmbH	Germany	100
Dionex Singapore Pte Ltd.	Singapore	100
Thermo Fisher Scientific Korea Ltd.	Korea	100
Dionex S.A.	France	100
Thermo Fisher Diagnostics (Ireland) Limited	Ireland	100
Dionex S.p.A. [.08% held privately]	Italy	99.92
Dionex China Limited	Hong Kong	100
Dionex (China) Analytical Ltd	China	100
Thermo Fisher Scientific Taiwan Co., Ltd.	Taiwan	100
Dionex Denmark A/S	Denmark	100
Thermo Fisher Scientific (Breda) Holding BV	Netherlands	100
Thermo Luxembourg S.a.r.l.	Luxembourg	100
Thermo TLH L.P. [.01% by Thermo TLH (U.K.) Limited]	Delaware	99.99
Thermo TLH (UK) Limited	England	100
Thermo TLH (MT) Limited [.000003% by Thermo TLH L.P.]	Malta	99.999997
Thermo TLH Luxembourg S.a.r.l.	Luxembourg	100
Thermo Fisher Scientific IT Services GmbH	Germany	100
Thermo Fisher Scientific GmbH	Germany	100
BmT GmbH Laborprodukte	Germany	100
Thermo Fisher Scientific (Real Estate 1) S.a.r.l.	Luxembourg	100
Thermo Fisher Scientific Messtechnik GmbH [10.04% by Thermo Fisher Scientific (Real Estate 1) GmbH & Co. KG]	Germany	89.96

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Thermo Electron (Karlsruhe) GmbH [10% by Thermo Fisher Scientific (Real Estate 1) GmbH & Co. KG]	Germany	90
Thermo Electron Pension Trust GmbH	Germany	100
Thermo Fisher Scientific (Real Estate 1) GmbH & Co. KG [0% by Fisher Scientific Germany Beteiligungs GmbH]	Germany	100
Thermo Fisher Scientific (Bremen) GmbH [10% by Thermo Fisher Scientific (Real Estate 1) GmbH & Co. KG]	Germany	90
La-Pha-Pack GmbH	Germany	100
Thermo Electron LED GmbH [10% by Thermo Fisher Scientific (Real Estate 1) GmbH & Co. KG]	Germany	90
Thermo Electron LED GmbH	Austria	100
Oxoid Deutschland GmbH	Germany	100
Microgenics B.V. & Co. KG [.01% by Thermo Fisher Germany B.V.]	Germany	99.9
ILS Laboratories Scandinavia, AB	Sweden	100
Advanced Scientifics International, Inc.	Pennsylvania	100
Advanced Scientifics, Inc.	Pennsylvania	100
Avances Cientificos de Mexico, S. de R.L. de C.V. [1.005% by Advanced Scientifics International, Inc.]	Mexico	98.995
Barnstead Thermolyne LLC	Delaware	100
Thermo Fisher Scientific China Holdings I B.V.	Netherlands	100
Thermo Fisher Scientific China Holdings II B.V.	Netherlands	100
Thermo Fisher Scientific China Holdings III B.V.	Netherlands	100
Thermo Fisher China Business Trust [1% by Thermo Fisher Scientific China Holdings IV B.V.]	China	99
Thermo Fisher Scientific China Holdings IV B.V.	Netherlands	100
Fisher Scientific International LLC	Delaware	100
NERL Diagnostics LLC	Wisconsin	100
FHP LLC	Delaware	100
Alchematrix, Inc.	Delaware	100
Fisher Internet Minority Holdings L.L.C.	Delaware	100
Alchematrix LLC	Delaware	100
Apogent Technologies Inc.	Wisconsin	100
Apogent Holding Company	Delaware	100
Niton Asia Limited	Hong Kong	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Matrix Technologies LLC	Delaware	100
Molecular BioProducts, Inc.	California	100
Intrinsic BioProbes, Inc.	Arizona	100
Labomex MBP, S. de R. L. De C.V. [.04% by Apogent Technologies Inc.]	Mexico	99.96
National Scientific Company	Wisconsin	100
Lab-Chrom-Pack LLC	New York	100
Robbins Scientific LLC	California	100
Apogent Transition Corp.	Delaware	100
Erie Scientific LLC	Delaware	100
Lab Vision (UK) Limited [.05% by Erie U.K. Limited]	England	99.95
Microm Laborgerate S.L.	Spain	100
Thermo Fisher Scientific Life Holdings II C.V. [10.000012% by Fisher WWD Holding L.L.C., .000060% by Fisher Scientific Worldwide Inc., and .000001% by Apogent Technologies Inc.]	Netherlands	89.999927
Thermo Fisher Scientific AL-1 LLC	Delaware	100
Thermo Fisher Scientific Life Holdings III C.V. [33.19378799% by Erie Scientific LLC, 20.30539491% by Thermo Fisher Scientific Inc., 2.01316373% by Thermo BioAnalysis LLC, and .00000002% by Thermo Fisher Scientific AL-1 LLC]	Netherlands	44.48765335
Thermo Fisher Scientific Life Investments GP LLC	Delaware	100
Thermo Fisher Scientific Life Investments C.V. [.00000002% by Thermo Fisher Scientific Life Investments GP LLC]	Netherlands	99.99999998
Thermo Fisher Scientific Life Senior GP Holdings II LLC	Delaware	100
Thermo Fisher Scientific Life Senior GP Holdings LLC	Delaware	100
Thermo Fisher Scientific Life Senior Holdings II C.V. [.01% by Thermo Fisher Scientific Life Senior GP Holdings II LLC]	Netherlands	99.99
TFSL Senior GP Holdings 2 LLC	Delaware	100
Thermo Fisher Scientific Life Senior Holdings C.V. [.01% by TFSL Senior GP Holdings 2 LLC]	Netherlands	99.99
TFSL Financing GP LLC	Delaware	100
Thermo Fisher Scientific Life CV GP Holdings LLC	Delaware	100
Thermo Fisher Scientific Life Holdings I C.V. [.01% by Thermo Fisher Scientific Life CV GP Holdings LLC]	Netherlands	99.99
Thermo Fisher Scientific Life Switzerland Holdings GP LLC	Delaware	100

	NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
	Thermo Fisher Scientific Switzerland Holdings C.V. [.01% by Thermo Fisher Scientific Life Switzerland Holdings GP LLC]	Netherlands	99.99
	Thermo Fisher Scientific AU LLC	Delaware	100
	Thermo Fisher Scientific AU C.V. [1% by Thermo Fisher Scientific AU LLC]	Netherlands	99
	Thermo Fisher Scientific Life Technologies Investment I LLC	Delaware	100
	Thermo Fisher Scientific Life Technologies Investment II LLC	Delaware	100
Holding LP Investment I LLC]	Thermo Fisher Scientific Life Technologies Investments [.10% by Thermo Fisher Scientific Life Technologies	England	99.90
	Thermo Electron Australia Pty Limited	Australia	100
	Thermo Trace Pty Ltd.	Australia	100
	Thermo Fisher Scientific Australia Pty Ltd	Australia	100
	Dionex Pty Limited	Australia	100
	Life Technologies Australia PTY Ltd.	Australia	100
	Lomb Scientific (Aust) Pty Limited	Australia	100
	Technology Design Solutions Pty Ltd	Australia	100
	App-Tek International Pty Ltd	Australia	100
Holdings Limited	Thermo Fisher Scientific New Zealand	New Zealand	100
	Thermo Fisher Scientific New Zealand	New Zealand	100
	Thermo Gamma-Metrics Holdings Pty Ltd.	Australia	100
	Thermo Gamma-Metrics Pty Ltd	Australia	100
	Thermo Electron (Chile) S.p.A.	Chile	100
	Thermo Fisher Scientific Life Financing (Cayman)	Cayman Islands	100
SRL	Thermo Fisher Scientific Life Financing (Barbados)	Barbados	100
UK II Limited	Thermo Fisher Scientific Life Technologies Investment	England	100
	Thermo Fisher Scientific Life Holdings Limited	England	100
Limited	Thermo Fisher Scientific Life Financing	England	100
	Thermo Fisher Scientific AU Limited	England	100
	Life Technologies Limited	Scotland	100
	Matrix MicroScience Ltd.	England	100
	Thermo Fisher Scientific Luxembourg Sweden Holdings II S.à r.l.	Luxembourg	100
	Thermo Fisher Scientific Switzerland B.V.	Netherlands	100
	SwissAnalytic Group GmbH	Switzerland	100
	Thermo Fisher Scientific (Ecublens) SARL	Switzerland	100

	NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
	Thermo Fisher Scientific Holdings Europe Limited	England	100
	Thermo Fisher Scientific SpA	Italy	100
	Fisher Luxembourg Danish Holdings SARL	Luxembourg	100
	Fisher Holdings ApS	Denmark	100
	Apogent Denmark ApS	Denmark	100
	Fisher BioImage ApS	Denmark	100
	Nunc A/S	Denmark	100
	Proxeon Biosystems ApS	Denmark	100
	Kendro Laboratory Products Ltd	England	100
	Kendro Containment & Services Limited	England	100
Limited	Thermo Fisher Scientific (Johannesburg) (Proprietary)	South Africa	100
	Thermo Fisher Scientific (Schweiz) AG	Switzerland	100
	Thermo Fisher Scientific Wissenschaftliche Geräte GmbH	Austria	100
	Thermo Fisher Scientific (Praha) s.r.o.	Czech Republic	100
	Thermo Electron Sweden Forvaltning AB [10.08% by Dionex Corporation]	Sweden	89.92
	Spectra-Physics AB	Sweden	100
	Thermo Fisher Scientific Spectra Malta Limited [.03997% by Thermo Fisher Scientific Spectra LLC]	Malta	99.96003
	Thermo Fisher Scientific Spectra S.a.r.l.	Luxembourg	100
Luxembourg II	Thermo Fisher Scientific Spectra-Physics Holdings S.à r.l.	Luxembourg	100
	Thermo MF Physics LLC	Delaware	100
Luxembourg	Thermo Fisher Scientific Spectra-Physics Holdings I S.à r.l.	Luxembourg	100
	Spectra-Physics Holdings USA, LLC	Delaware	100
Investments Malta Holdings USA,	Thermo Fisher Scientific Spectra-Physics Limited [.0000011% by Spectra-Physics LLC]	Malta	99.9999989
	Thermo Fisher Scientific Spectra LLC	Delaware	100
	Spectra-Physics Holdings Limited	England	100
	Thermo Fisher Scientific Japan Holdings III B.V.	Netherlands	100
	Thermo Fisher Scientific K.K. [0% by TFS Breda B.V. – preferred shares]	Japan	100
	Saroph Sweden AB	Sweden	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Thermo Electron Sweden AB	Sweden	100
Thermo Life Sciences AB	Sweden	100
TFS Breda B.V. [.25% by Thermo Fisher Scientific C.V.]	Netherlands	99.75
Thermo Fisher Scientific Life Financing C.V. [38.65428508% by Thermo Fisher Scientific Life Holdings I C.V. and .00000003% by TFSL Financing GP LLC]	Netherlands	61.34571489
Metavac LLC	Delaware	100
Abgene Inc.	Delaware	100
Apogent Finance Company	Delaware	100
Capitol Vial, Inc.	Alabama	100
Capitol Scientific Products, Inc.	New York	100
Chase Scientific Glass, Inc. [50% by Apogent Holding Company]	Wisconsin	50
EP Scientific Products LLC	Delaware	100
Erie Scientific Company of Puerto Rico	Delaware	100
Erie Scientific Hungary Ipari és Szolgáltató Kft	Hungary	100
Erie UK Holding Company	Delaware	100
Erie LP Holding LLC	Delaware	100
Fisher Scientific Investments (Cayman), Ltd.	Cayman Islands	100
Thermo Fisher Scientific Erie Financing (Barbados) SRL	Barbados	100
Erie U.K. Limited	England	100
Nalge Nunc International Corporation	Delaware	100
Epsom Glass Industries Limited	England	100
Thermo Fisher Scientific (Monterrey), S. De R.L. De C.V. [1% by Nalge Nunc International (Monterrey) LLC]	Mexico	99
236 Perinton Parkway, LLC	New York	100
ARG Services LLC	Delaware	100
Owl Separation Systems LLC	Wisconsin	100
Nalge Nunc International (Monterrey) LLC	Delaware	100
Erie UK Senior Holding Limited [1.01% by Erie LP Holding LLC]	England	98.99
LambTrack Limited	England	100
Erie UK 2 Limited	England	100
Thermo BioSciences Holdings LLC	Delaware	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Pierce Biotechnology, Inc.	Delaware	100
Perbio Science, Inc.	Delaware	100
Pierce Milwaukee, Inc.	Delaware	100
Pierce Milwaukee Holding Corp.	Delaware	100
Thermo Fisher Scientific (Milwaukee) LLC [1% by Pierce Milwaukee, Inc.]	Delaware	99
Advanced Biotechnologies Limited	England	100
Abgene Limited	England	100
Apogent U.K. Limited	England	100
Matrix Technologies Corporation Limited	England	100
Nalge (Europe) Limited	England	100
Chromacol Limited	England	100
Ever Ready Thermometer Co., Inc.	Wisconsin	100
Fisher Asia Manufacturing Ventures Inc. [20% held privately]	British Virgin Islands	80
Samco Scientific LLC	Delaware	100
Samco Scientific (Monterrey) LLC	Delaware	100
Seradyn Inc.	Delaware	100
Applied Scientific Corporation	California	100
Cellomics, Inc.	Delaware	100
Fisher BioSciences Japan G.K.	Japan	100
CTPS LLC	Delaware	100
Clintrak Pharmaceutical Services, LLC	Delaware	100
Fisher Clinical Services (Bristol), LLC	Delaware	100
Clintrak Clinical Labeling Services, LLC	Delaware	100
Columbia Diagnostics, Inc.	Delaware	100
Drakeside Real Estate Holding Company LLC	Delaware	100
Duke Scientific Corporation	California	100
Fisher Clinical Services Inc.	Pennsylvania	100
Eutech Instruments Pte Ltd.	Singapore	100
Eutech Instruments Europe B.V.	Netherlands	100
Eutech Instruments Sdn Bhd	Malaysia	100
Thermo Fisher Scientific Brasil Serviços de Logística Ltda [.001% by Fisher BioServices Inc.]	Brazil	99.999

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Fisher BioServices Inc.	Virginia	100
Southern Trials (Pty) Ltd.	South Africa	100
Schantz Road LLC	Pennsylvania	100
Specialty (SMI) Inc.	California	100
Fisher Germany Holdings GmbH	Germany	100
Fisher Hamilton China Inc.	Delaware	100
Fisher Manufacturing (Malaysia) Sdn Bhd	Malaysia	100
Fisher Scientific Brazil Inc.	Delaware	100
Systems Manufacturing Corporation	Delaware	100
Fisher Scientific Central America Inc.	Delaware	100
Fisher Scientific Chile Inc.	Delaware	100
Consultores Fisher Scientific Chile Ltd [50% by Fisher Scientific Worldwide Inc.]	Chile	50
Fisher Scientific Colombia Inc.	Delaware	100
Fisher Scientific Company L.L.C.	Delaware	100
Fisher Scientific Costa Rica Sociedad de Responsabilidad Limitada	Costa Rica	100
Thermo Fisher Scientific Brahms LLC	Delaware	100
Biochemical Sciences LLC	Delaware	100
Fisher Scientific de Mexico S.A.	Mexico	100
Medical Analysis Systems, Inc.	Delaware	100
Medical Analysis Systems International, Inc.	California	100
Medical Diagnostics Systems, Inc.	California	100
United Diagnostics, Inc.	Delaware	100
Fisher Scientific Latin America Inc.	Delaware	100
Fisher Scientific Mexico Inc.	Delaware	100
FS Mexicana Holdings LLC [.01% by Fisher Scientific Mexicana, S. de R.L. de C.V.]	Delaware	99.99
Fisher Alder S. de R.L. de C.V. [.0020% by Fisher Scientific International LLC]	Mexico	99.9980
Fisher Hamilton Mexico LLC	Delaware	100
Fisher Scientific Mexicana, S. de R.L. de C.V. [.01% by Fisher Scientific Worldwide Inc.]	Mexico	99.99
FS Casa Rocas Holdings LLC [1% by Fisher Mexico, S. de R.L. de C.V.]	Delaware	99

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Fisher Mexico, S. de R.L. de C.V. [.0000269% by FS Casa Rocas Holdings LLC]	Mexico	99.9999731
Fisher Scientific Middle East and Africa Inc.	Delaware	100
Fisher Scientific Operating Company	Delaware	100
Fisher Scientific Venezuela Inc.	Delaware	100
Fisher Scientific Worldwide (Shanghai) Co., Ltd.	China	100
FRC Holding Inc., V	Delaware	100
FS (Barbados) Capital Holdings Ltd.	Barbados	100
Golden West Indemnity Company Limited	Bermuda	100
Liberty Lane Real Estate Holding Company LLC	Delaware	100
New FS Holdings Inc.	Delaware	100
Hangar 215, Inc.	Delaware	100
Fisher Scientific Worldwide Inc.	Delaware	100
FSIR Holdings (US) Inc. [1.265% by Fisher Clinical Services Inc.]	Delaware	98.735
Liberty Lane Investment LLC	Delaware	100
Fisher Scientific Holding Company LLC	Delaware	100
Fisher Scientific Holdings (M) Sdn Bhd	Malaysia	100
Bumi-Sans Sendirian Berhad	Malaysia	100
Fisher Scientific (M) Sdn Bhd	Malaysia	100
General Scientific Company Sdn Bhd (M)	Malaysia	100
Fisher Scientific Holdings (S) Pte Ltd	Singapore	100
Fisher Scientific Pte. Ltd. [16.57% by Fisher Scientific International LLC]	Singapore	83.43
Fisher Scientific (SEA) Pte. Ltd.	Singapore	100
Fisher Scientific Australia Pty Limited	Australia	100
FSIR Holdings (UK) Limited	England	100
FSWH Company LLC	Delaware	100
FSI Receivables Company LLC	Delaware	100
Fisher Bermuda Holdings Limited	Bermuda	100
Thermo Fisher Scientific FSIR Financing (Barbados) SRL	Barbados	100
Thermo Fisher Scientific FSIR Financing S.a.r.l.	Luxembourg	100
Fisher Scientific Worldwide Holdings I C.V. [12% by Fisher Scientific Worldwide Inc.]	Netherlands	88

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Finesse Solutions, Inc.	Delaware	100
Finesse Scientific Equipment (Shanghai) Co., Ltd.	China	100
Finesse Solutions AG	Switzerland	100
FSWH International Holdings LLC	Delaware	100
Thermo Fisher Scientific Life Investments US Financing I LLC [1% by FSIR Holdings (US) Inc.]	Delaware	99
Phadia International Holdings C.V. [10% by FSIR Holdings (US) Inc.]	Netherlands	90
Power Sweden Holdings III Aktiebolag	Sweden	100
Phadia International LLC	Delaware	100
Thermo Fisher Scientific B.V.B.A.	Belgium	100
Thermo Fisher Scientific Worldwide Investments (Cayman)	Cayman Islands	100
Thermo Fisher Scientific Worldwide Investments (Luxembourg) S.a.r.l.	Luxembourg	100
Thermo Fisher Scientific Worldwide Investments LLC	Delaware	100
Thermo Fisher Scientific Investments (Sweden) S.a.r.l. [16.086% by CHK Holdings Inc.]	Luxembourg	83.914
Thermo Fisher Scientific Life Investments I S.a.r.l.	Luxembourg	100
Thermo Fisher Scientific Investments (Sweden) II LLC	Delaware	100
Thermo Fisher Scientific Investments Malta (Sweden Financing) Limited [.00000002% by Thermo Fisher Scientific Investments (Sweden) LLC and 26.76040344% by Thermo Fisher Scientific Life Investments I S.a.r.l.]	Malta	73.23959654
Thermo Fisher Scientific Investments (Sweden) LLC	Delaware	100
Thermo Fisher Scientific Denmark Senior Holdings ApS	Denmark	100
Fisher Scientific Holding HK Limited [.01% by Fisher Scientific Holding Company LLC]	Hong Kong	99.99
Fisher Scientific (Hong Kong) Limited [.022% Fisher Scientific Holding Company LLC]	Hong Kong	99.978
Fisher Scientific Japan, Ltd.	Japan	100
Fisher Scientific Korea Ltd	Korea	100
Fisher WWD Holding L.L.C.	Delaware	100
Kyle Jordan Investments LLC	Delaware	100
Pacific Rim Far East Industries LLC	Delaware	100
Pacific Rim Investment, LLC	Delaware	100
Marketbase International Limited	Hong Kong	100
Thermo-Fisher Biochemical Product (Beijing) Co., Ltd.	China	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
HighChem s.r.o.	Slovakia	100
Thermo Fisher Scientific HR Services Mexico, S. de R.L. de C.V. [1% by Fisher Clinical Services (Mexico) LLC]	Mexico	99
Thermo Fisher Scientific China (C-I) LLC	Delaware	100
Shanghai Thermo Fisher (C-I) Trading Co. Ltd	China	100
Pasteur Acquisition SRL	Barbados	100
Thermo Fisher Scientific China (S) LLC	Delaware	100
Shanghai Thermo Fisher (S) Trading Co. Ltd	China	100
Molecular Transfer, Inc.	Delaware	100
Thermo Fisher Scientific Cyprus I Ltd	Cayman Islands	100
Thermo Fisher Scientific Cyprus II Ltd	Cayman Islands	100
Thermo Fisher Scientific India Holding LLC	Delaware	100
Thermo Fisher Scientific Cyprus III Ltd	Cayman Islands	100
Thermo Fisher Cyprus Holdings LLC	Delaware	100
Thermo Fisher Detection Mexico LLC	Delaware	100
Thermo Fisher Scientific Cyprus I C.V. [1% by Thermo Fisher Cyprus Holdings LLC]	Netherlands	99
Thermo Fisher Scientific Cyprus II C.V. [1% by Thermo Fisher Cyprus Holdings LLC]	Netherlands	99
Thermo Fisher Scientific Cyprus III C.V. [1% by Thermo Fisher Cyprus Holdings LLC]	Netherlands	99
Thermo Fisher Scientific Cyprus IV C.V. [1% by Thermo Fisher Cyprus Holdings LLC]	Netherlands	99
Thermo Fisher Scientific Cyprus V C.V. [1% by Thermo Fisher Cyprus Holdings LLC]	Netherlands	99
Thermo Fisher Costa Rica Sociedad de Responsabilidad Limitada [1% by Fisher Scientific Company L.L.C.]	Costa Rica	99
Thermo Fisher Scientific South Africa Proprietary Ltd	South Africa	100
TFS Third Avenue (Barbados) I Srl	Barbados	100
TFS (Barbados) I Srl	Barbados	100
Thermo Services (Hungary) Kft	Hungary	100
Thermo Fisher Scientific One Limited	England	100
Erie UK 1 Limited	England	100
Erie UK 5 Limited	England	100
Erie US II LLC	Delaware	100

NAME	STATE OR JURISDICTION OF INCORPORATION	PERCENT OF OWNERSHIP
Erie Finance Holding Limited	England	100
Erie Finance Limited	England	100
Erie Finance 1 Limited	England	100
Erie UK 3 Limited [1% by Erie US III LLC]	England	99
Erie Finance 2 Limited	England	100
Thermo Fisher Scientific (Finance I) B.V.	Netherlands	100
Life Technologies Finland Oy	Finland	100
Erie US III LLC	Delaware	100
Thermo Fisher Scientific Erie Financing S.a r.l	Luxembourg	100
Erie Luxembourg LLC	Delaware	100
Thermo Fisher Scientific Erie 1 Financing (Barbados) SRL	Barbados	100
Thermo Fisher Scientific EMEA Limited	Ireland	100

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-3 (No. 333-229951) and Form S-8 (Nos. 33-51189, 33-54347, 333-127246, 333-146068, 333-152344, 333-161939, 333-188846 and 333-220231) of Thermo Fisher Scientific Inc. of our report dated February 26, 2020 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts
February 26, 2020

THERMO FISHER SCIENTIFIC INC.

CERTIFICATION REQUIRED BY EXCHANGE ACT RULES 13a-14(a) and 15d-14(a),
AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Marc N. Casper, certify that:

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

Date: February 26, 2020

/s/ Marc N. Casper

Marc N. Casper

Chairman, President and Chief Executive Officer

THERMO FISHER SCIENTIFIC INC.CERTIFICATION REQUIRED BY EXCHANGE ACT RULES 13a-14(a) and 15d-14(a),
AS ADOPTED PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Stephen Williamson, certify that:

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

Date: February 26, 2020

/s/ Stephen Williamson

Stephen Williamson
Senior Vice President and Chief Financial Officer

THERMO FISHER SCIENTIFIC INC.

CERTIFICATION REQUIRED BY EXCHANGE ACT RULES 13a-14(b) and 15d-14(b),
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K of Thermo Fisher Scientific Inc. (the "Company") for the period ended December 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, Marc N. Casper, Chairman, President and Chief Executive Officer of the Company, hereby certifies, pursuant to Securities Exchange Act of 1934 Rules 13a-14(b) and 15d-14(b), that:

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

Dated: February 26, 2020

/s/ Marc N. Casper

Marc N. Casper
Chairman, President and Chief Executive Officer

A signed original of this written statement required by Section 906, or other document authenticating, acknowledging, or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906, has been provided to Thermo Fisher Scientific Inc. and will be retained by Thermo Fisher Scientific Inc. and furnished to the Securities and Exchange Commission or its staff upon request.

THERMO FISHER SCIENTIFIC INC.

CERTIFICATION REQUIRED BY EXCHANGE ACT RULES 13a-14(b) and 15d-14(b),
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report on Form 10-K of Thermo Fisher Scientific Inc. (the "Company") for the period ended December 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, Stephen Williamson, Senior Vice President and Chief Financial Officer of the Company, hereby certifies, pursuant to Securities Exchange Act of 1934 Rules 13a-14(b) and 15d-14(b), that:

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

Dated: February 26, 2020

/s/ Stephen Williamson

Stephen Williamson
Senior Vice President and Chief Financial Officer

A signed original of this written statement required by Section 906, or other document authenticating, acknowledging, or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906, has been provided to Thermo Fisher Scientific Inc. and will be retained by Thermo Fisher Scientific Inc. and furnished to the Securities and Exchange Commission or its staff upon request.