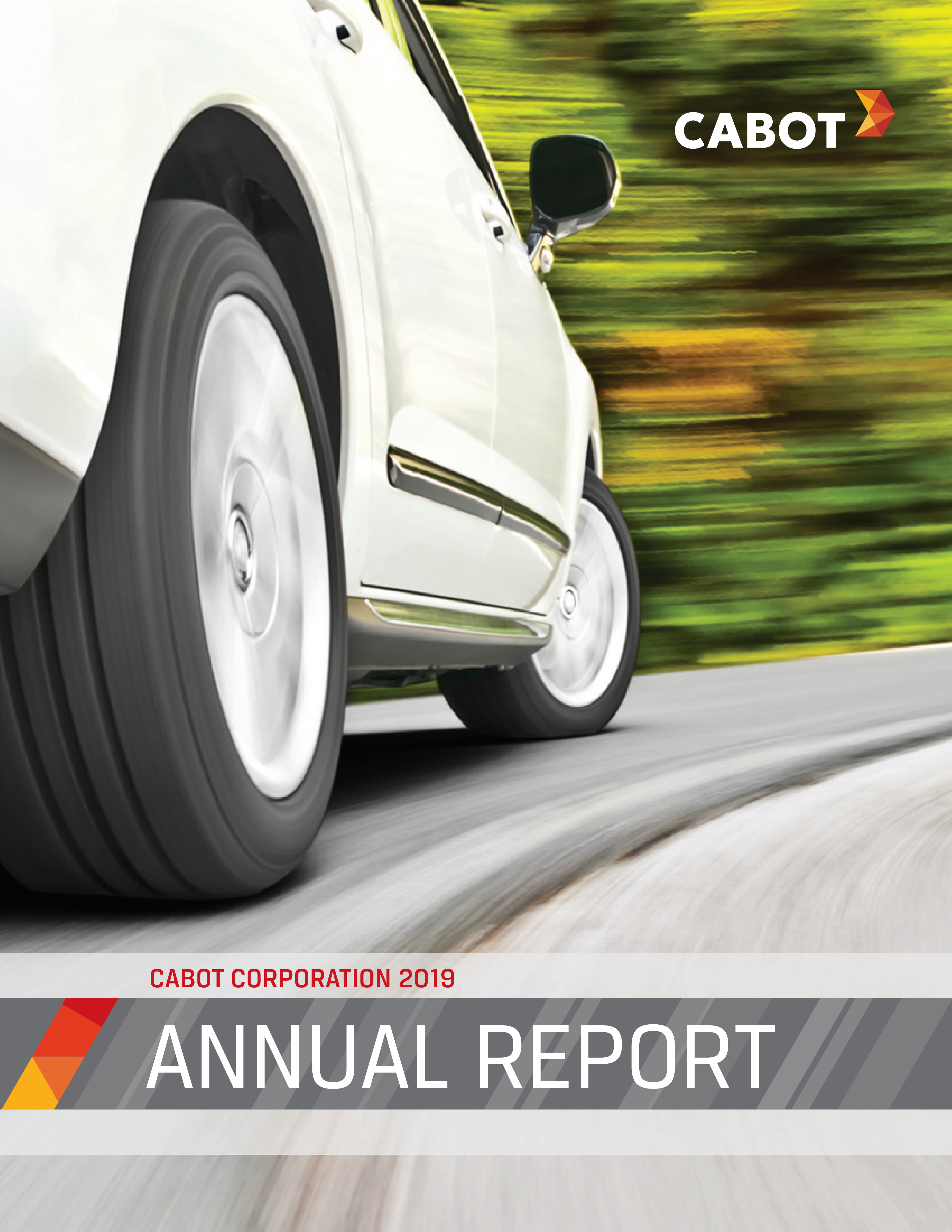
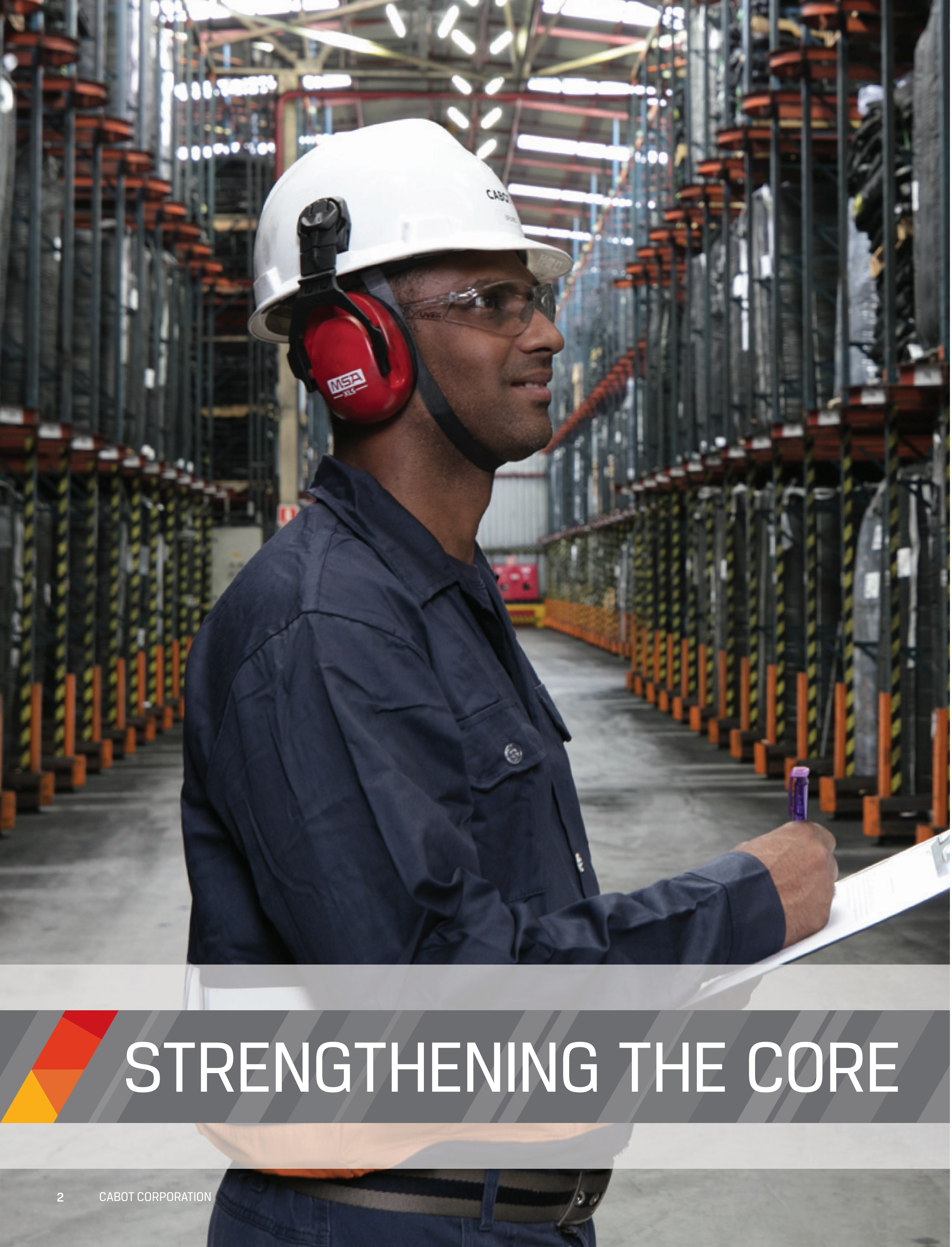
CABOT



CABOT CORPORATION 2019

ANNUAL REPORT



STRENGTHENING THE CORE

Cabot Corporation is a leading global specialty chemicals and performance materials company headquartered in Boston, Massachusetts, USA, that has delivered innovative performance solutions to customers for over 135 years.

We strive to be the most innovative, respected and responsible leader in our markets — delivering performance that makes a difference. As a market leader, we collaborate with customers to find innovative solutions that will help them advance their own products for a wide range of industries, from transportation and infrastructure to environment and consumer goods. Our customers worldwide trust our solutions to help them address their needs and accelerate innovation in key applications — creating value and delivering an advantage over the competition.

Our global network consists of 42 manufacturing facilities throughout 20 countries. All are joined by our commitment and continued dedication to safety, health and environmental leadership and progress.

OUR BUSINESS SEGMENTS

REINFORCEMENT MATERIALS

Rubber Blacks; Elastomer Composites

Carbon black to reinforce and optimize the performance of rubber products including: tires, hoses, belts, molded goods

PERFORMANCE CHEMICALS

Specialty Carbons and Formulations; Metal Oxides

Specialty additives that enable performance in: plastics, wire and cable, toners, coatings, adhesives and sealants, electronics, batteries, inks, inkjet printing, composites, silicones, building construction materials, industrial insulation

PURIFICATION SOLUTIONS

Activated Carbon

Activated carbon for purification in various applications including: air and water, food and beverages, pharmaceuticals, catalysts

A MESSAGE TO OUR SHAREHOLDERS

As we welcome a new year, it is important to reflect on what our team has achieved over the past year and exciting to look ahead to the opportunities in front of us. In fiscal 2019, we strengthened our leadership and competitive position in our core markets while advancing our commitment to sustainability.

Advancing Our Strategy

We are committed to long-term value creation for our shareholders and this requires a consistency of strategic action. I am pleased that we advanced a number of key strategic investments in the fiscal year and have achieved important milestones. With the divestiture of the Specialty Fluids business, we further focused our portfolio and used the proceeds to repurchase shares above our stated capital allocation framework and to invest in advantaged opportunities in our core businesses.

We commenced operations at our new fumed silica plant in Wuhai, China, extending our market leading position. Given that China produces nearly 50% of the world's silicones, it is a critical geography for the long-term growth of fumed silica. In the year, we also began the upgrade of our new carbon black site in Pizhou, China to produce specialty carbons. We believe this investment will prove to be a very capital efficient platform to further expand our specialty carbons business in Asia Pacific over time.

While these important investments will enable growth in our core businesses, our strategy is also built around application innovation in attractive high growth markets. On this front, we are particularly excited about our investments in our Energy Materials and Cabot Elastomer Composites product lines. Lithium-ion batteries are central to the growth of vehicle electrification and energy storage, and conductive carbon additives play an important role in the battery chemistry. Over the last few years, we have been investing in our assets, product portfolio and customer qualifications to build a long-term position in this valuable high growth application. While still relatively small, we believe this business will become a material contributor to the Performance Chemicals segment in the next five years.

Cabot Elastomer Composites (CEC) has the potential to transform key applications in the tire industry over time, by driving greater wear performance. After achieving commercial validation a few years ago with a major global tire producer, our efforts are focused on driving broader adoption and continued penetration into a range of tire applications. We achieved key development milestones in fiscal 2019 and remain excited by the long-term growth potential of CEC.

Driving Financial Performance

Fiscal year 2019 was certainly more challenging than anticipated for the chemical and materials sector. Demand in several of our important end markets declined, including automotive production, which was down more than 5%, with particular weakness in China and Europe. Furthermore, the US/China trade friction contributed to a slowdown in the Chinese economy, with the industrial and manufacturing sectors in China experiencing their lowest growth rates in recent years.

Despite these challenges, our team navigated well and delivered solid performance in the year, driven by a countermeasure mentality and a strong focus on execution. We delivered diluted earnings per share (EPS) of $2.63 and adjusted EPS* of $3.91 in the fiscal year and strong cash generation performance, with operating cash flow of $363 million and free cash flow* of $137 million. Our focus on cash generation allowed us to remain committed to our capital allocation framework, which seeks to balance investments for growth in our core businesses with strong cash return to our shareholders. I am pleased with our performance on this front.

Focusing on Sustainability

In uncertain times like this, it is important to stay true to our vision. At Cabot, we strive to be the most innovative, respected and responsible leader in our markets, delivering performance that makes a difference. We believe that corporations have an obligation to serve a broad set of stakeholders and long-term success requires a commitment to sustainability in its broadest form and a balanced approach to managing stakeholder expectations.

I am proud of our continued leadership in this area, led by our strong and diverse board and executive management team. We are committed to operating responsibly and these commitments are best captured in our annual Sustainability Report. Based on our outstanding environmental, social and governance transparency and performance, we were recognized by *Corporate Responsibility Magazine* in 2019 as one of the 100 best companies. I am also pleased to share that Cabot received a Gold rating from EcoVadis for our sustainability program for the fourth year in a row. Validation from independent organizations like EcoVadis demonstrates to all stakeholders our level of commitment and transparency. I am immensely proud of these achievements and I know each of our 4,500 employees worldwide take great pride in our performance and are committed to a spirit of continuous improvement.

Innovation is a critical dimension of our sustainability agenda and it is essential to our ability to win in the marketplace and grow. This is why we are committed to further embedding sustainability into our product development engagements with customers. A great example of this is the work we are doing to help plastics converters address sustainability challenges from their customers. We recently launched a new black masterbatch series that utilizes postindustrial carbon black and recycled polymers. These formulations are specifically designed to help the value chain lower its carbon footprint and increase the amount of recycled and secondary content in end products. In line with our sustainability objectives, we became a signatory of the Ellen MacArthur Foundation's New Plastics Economy Global Commitment. We have also pledged to take actions to reduce plastic waste as part of the Operation Clean Sweep® program.

At Cabot, we recognize that a diverse and inclusive workforce is vital for our sustained success and we strive to build a workplace where everyone can contribute, grow and thrive. I am honored to have joined more than 800 CEOs in taking the CEO Action for Diversity & Inclusion™ pledge. With this pledge, we commit to continue working to foster an environment of inclusion, where the richness of ideas, backgrounds and perspectives is accepted, respected and valued.

Looking Ahead

As we look ahead, we will continue to focus on the long-term and make decisions that strengthen our company. Our aim is to build leadership by executing flawlessly and investing for advantaged growth. Cash generation will remain a focus and we will continue our commitment to capital allocation, with a balance of growth investments in our core businesses and cash return.

In closing, I would like to express my deep gratitude and appreciation to our employees for their commitment to Cabot. It is their hard work and dedication that enables us to excel. I also want to thank you, our shareholders, for your ongoing support, confidence and trust.

Thank you,

Sean D. Keohane
President and Chief Executive Officer

** Non-GAAP financial measure. Refer to non-GAAP reconciliations on page 10.*

CABOT 2019 MILESTONES

Celebrated 50 Years on the New York Stock Exchange

We celebrated our 50th anniversary of being listed on the New York Stock Exchange (NYSE) by ringing The Closing Bell.

Received EcoVadis Gold Level Rating for Fourth Consecutive Year

We received a gold level rating from EcoVadis for the fourth consecutive year. We achieved our highest score ever and ranked in the top 1% of all companies assessed, highlighting our leadership position and commitment to best practices.

Divested Specialty Fluids Segment

We completed the sale of our Specialty Fluids business to Sinomine (Hong Kong) Rare Metals Resources Co. Limited for approximately $135 million.

Increased Carbon Black Capacity

We continued to increase global carbon black capacity through plant expansions, operational improvements and debottlenecking projects. Following the completion of the purchase of our new carbon black plant in Pizhou, China we began upgrading the facility to serve our specialty carbons customers.

Signed the CEO Action for Diversity and Inclusion™ Pledge

We joined more than 800 CEOs in signing the CEO Action for Diversity & Inclusion™ pledge – underscoring our commitment to advancing diversity and inclusion while creating a workplace where all employees can contribute, thrive and grow.

CEO ACT!ON FOR DIVERSITY & INCLUSION

Completed Responsible Care® 14001 Certification for all China Manufacturing Operations

We completed RC14001® certification at all of our operating carbon black and fumed silica manufacturing sites in China. The Cabot China certifications are the first independent third party RC14001 Certifications to be recognized by the Certification and Accreditation Administration of the People's Republic of China (CNCA) as well as the American Chemistry Council (ACC).

Celebrated Grand Opening of New Wuhai Fumed Silica Facility

We commissioned a new, state-of-the-art fumed silica manufacturing site in Wuhai, China. The additional capacity extended our global leadership position and made us the largest provider of fumed silica in China.

Achieved First FSSC 22000 Food Safety System Certification

Our activated carbon plant in Klazienaveen, the Netherlands received FSSC 22000 Food Safety System Certification, the highest level of food safety assurance, adding an extra layer of assurance for food manufacturers seeking the safest, highest quality ingredients and purification products.

Named to *CR Magazine* 100 Best Corporate Citizens of 2019

We were recognized for our outstanding environmental, social and governance (ESG) transparency and performance by ranking #47 on *CR Magazine's* 100 Best Corporate Citizens of 2019 list.

Celebrated First Ever Global Sustainability Day

Since 2008, we have celebrated Global Safety Day each year during which our employees around the world took time to recognize our accomplishments and reaffirm our 'Drive to Zero' and safety commitments. In 2019, we expanded our focus by celebrating our first ever Global Sustainability Day to further engage our team in our overall sustainability efforts.

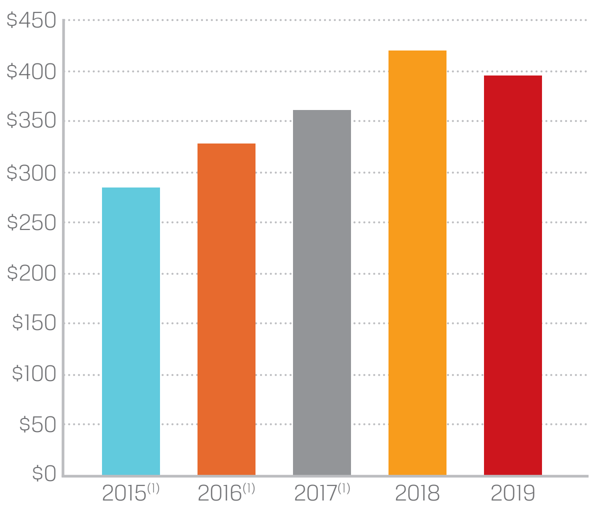
CABOT CORPORATION FINANCIAL HIGHLIGHTS

(dollars in USD millions, except per share amounts)

Fiscal Year	2015[(1)]	2016[(1)]	2017[(1)]	2018	2019
Operating Results					
Operating revenues	$2,871	$2,411	$2,717	$3,242	**$3,337**
Net income (loss) attributable to Cabot Corporation[(2)]	$(334)	$147	$248	$(113)	**$157**
Per diluted common share[(2)]	$(5.27)	$2.32	$3.91	$(1.85)	**$2.63**
Adjusted earnings per share[(3)]	$2.71	$3.10	$3.54	$4.03	**$3.91**
Financial Positions					
Total assets	$3,063	$3,052	$3,338	$3,244	**$3,004**
Net property, plant and equipment	$1,383	$1,290	$1,305	$1,296	**$1,348**
Stockholders' equity	$1,338	$1,389	$1,625	$1,279	**$1,134**

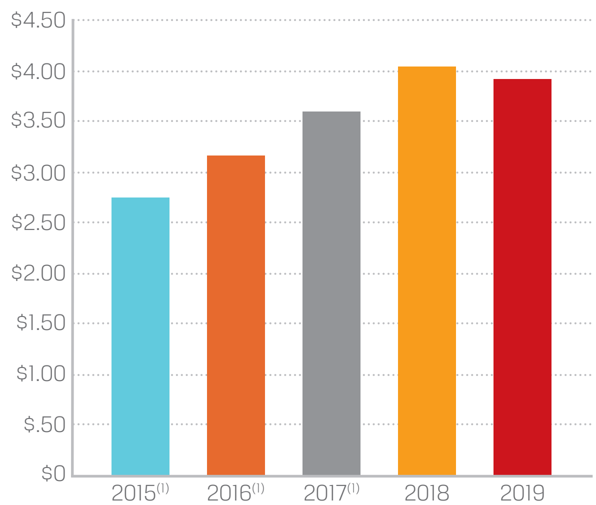
Adjusted EBIT ($M)[(3)]

$M/fiscal year



Adjusted Earnings Per Share ($)[(3)]

$ per share/fiscal year



(1) In fiscal 2018, the Company elected to change its inventory valuation method of accounting for its U.S. carbon black inventories from the last-in, first-out ("LIFO") method to the first-in, first-out ("FIFO") method. The Company applied this change retrospectively and fiscal 2017 and 2016 balances have been updated accordingly. Fiscal 2015 has not been updated to reflect this change and may not be comparable to the other years presented.

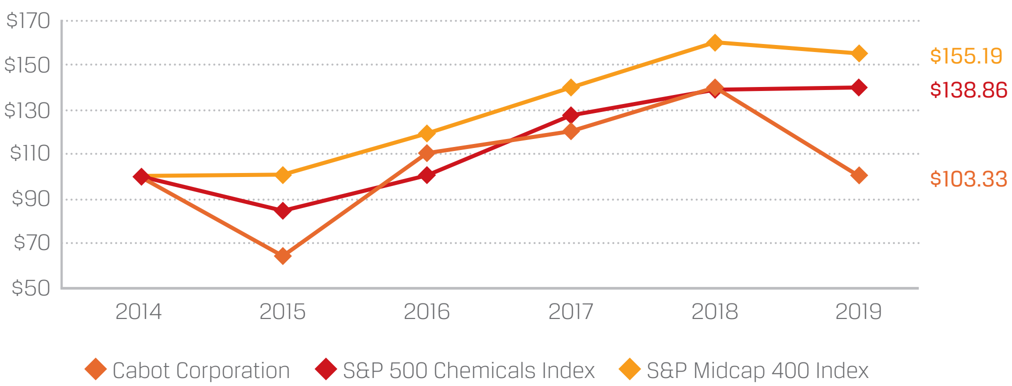
(2) Fiscal 2018 results include after-tax certain items totaling a charge of $365 million, or $5.88 per share. The certain items charge is primarily due to the Purification Solutions impairment and the impact from the recent U.S. tax reform. Fiscal 2015 results include after-tax certain items totaling a charge of $510 million, or $7.98 per share. The certain items charge is primarily due to the Purification Solutions impairment.

(3) Non-GAAP financial measure, excludes financial results of divested businesses and certain items. Refer to non-GAAP reconciliations on page 10 for a reconciliation of these measures to their most directly comparable GAAP financial measure.

FINANCIAL PERFORMANCE

PERFORMANCE GRAPH

The graph compares the cumulative total stockholder return on Cabot common stock for the five-year period ending September 30, 2019 with the S&P 500 Chemicals Index and the S&P Midcap 400 Index. The comparisons assume the investment of $100 on October 1, 2014 in Cabot's common stock and in each of the indices and the reinvestment of all dividends.



RETURNED **$253 MILLION** TO SHAREHOLDERS

DILUTED EPS OF **$2.63** AND ADJUSTED EPS* OF **$3.91**

FREE CASH FLOW* **$139 MILLION** AND OPERATING CASH FLOW OF **$363 MILLION**

** Non-GAAP financial measure. Refer to non-GAAP reconciliations on page 10.*

FINANCIAL PERFORMANCE

NON-GAAP RECONCILIATIONS

Adjusted EPS, adjusted EBIT and free cash flow are not measures of financial performance under U.S. generally accepted accounting principles (GAAP) and should not be considered in isolation from, or as replacements for, earnings per share from continuing operations or income from continuing operations before taxes determined in accordance with GAAP, nor as substitutes for measures of profitability or performance reported in accordance with GAAP. Adjusted EPS and adjusted EBIT exclude certain items of expense or income that management does not consider representative of our ongoing performance. The following tables reconcile non-GAAP measures used in this report to the closest GAAP measure.

Reconciliation of Adjusted Earnings Per Share (EPS)

Per Share / Fiscal Year	2015	2016	2017	2018[1]	2019
Net income (loss) per share attributable to Cabot Corporation[1]	$(5.27)	$2.32	$3.91	$(1.85)	**$2.63**
Less: Net income (loss) per share from discontinued operations	$0.02	$0.02	$ -	$ -	**$ -**
Net income (loss) per share from continuing operations[1]	$(5.29)	$2.30	$3.91	$(1.85)	**$2.63**
Less: Certain items per share and dilutive impact of shares[1]	$(8.00)	$(0.80)	$0.37	$(5.88)	**$(1.28)**
Adjusted earnings per share	**$2.71**	**$3.10**	**$3.54**	**$4.03**	**$3.91**

Reconciliation of Adjusted Earnings Before Interest and Taxes (EBIT)

Dollars in Millions / Fiscal Year	2015	2016	2017	2018[1]	2019
Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies[1]	$(377)	$191	$299	$117	**$255**
Interest expense	$53	$54	$53	$54	**$59**
Certain items[1]	$617	$81	$3	$248	**$87**
General unallocated expense	$(11)	$(4)	$(3)	$(2)	**$(8)**
Equity in earnings of affiliated companies	$4	$3	$7	$2	**$1**
Adjusted EBIT	**$286**	**$325**	**$359**	**$419**	**$394**

Reconciliation of Free Cash Flow

Dollars in Millions / Fiscal Year	2015[4]	2016[4]	2017[4]	2018	2019
Cash flow from operating activities[2]	$499	$392	$348	$298	**$363**
Less: Additions to property, plant and equipment	$141	$112	$147	$229	**$224**
Free Cash Flow	**$358**	**$280**	**$201**	**$69**	**$139**

[1] Fiscal 2018 results include after-tax certain items totaling a charge of $365 million, or $5.88 per share. The certain items charge is primarily due to the Purification Solutions impairment and the impact of tax reform in the U.S. Fiscal 2015 results include after-tax certain items totaling a charge of $510 million, or $8.00 per share. The certain items charge is primarily due to the Purification Solutions impairment. In both fiscal 2018 and fiscal 2015, the certain items per share amount also includes the dilutive impact of shares, which was $0.02 in both periods. Due to the Company's Net Loss position in fiscal 2018 and fiscal 2015 primarily driven by the certain items described above, GAAP EPS was calculated using basic weighted average shares to avoid anti-dilution. However, in order to provide an Adjusted Non-GAAP EPS with a weighted average share figure that is consistent with all other periods presented, the Company included this reconciling item to quantify the difference between basic and diluted weighted average shares.

[2] As provided in the Consolidated Statement of Cash Flows for the presented period.

[3] In fiscal 2018, the Company elected to change its inventory valuation method of accounting for its U.S. carbon black inventories from the last-in, first-out ("LIFO") method to the first-in, first-out ("FIFO") method. Additionally, in fiscal 2018 the Company adopted a new standard issued by the Financial Accounting Standards Board ("FASB") that amends the accounting standard for stock compensation by simplifying several aspects of the accounting for employee share-based payment transactions, which includes classification in the Statements of Cash Flows. The Company applied these changes retrospectively and fiscal 2017 and 2016 balances have been updated accordingly. Fiscal 2015 balance have not been updated to reflect these changes and may not be comparable to the other years presented.

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 September 30, 2019

or

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

For the transition period from to

Commission File Number 1-5667

Cabot Corporation

(Exact name of Registrant as specified in its Charter)

Delaware	**04-2271897**
(State or other jurisdiction of incorporation or organization)	*(I.R.S. Employer Identification No.)*
Two Seaport Lane, Suite 1300 Boston, Massachusetts	**02210**
(Address of Principal Executive Offices)	*(Zip Code)*

Registrant's telephone number, including area code: (617) 345-0100

Securities registered pursuant to Section 12(b) of the Securities Exchange Act of 1934:

Title of each class	Trading symbol(s)	Name of each exchange on which registered
Common Stock, $1 par value per share	CBT	The New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Securities Exchange Act of 1934: None.

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

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

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

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

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

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

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

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

As of the last business day of the Registrant's most recently completed second fiscal quarter (March 31, 2019), the aggregate market value of the Registrant's common stock held by non-affiliates was $2,411,701,500. As of November 18, 2019, there were 56,977,900 shares of the Registrant's common stock outstanding.

Portions of the Registrant's definitive proxy statement for its 2020 Annual Meeting of Shareholders are incorporated by reference into Part III of this report.

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PART IV

Information Relating to Forward-Looking Statements

This annual report on Form 10-K contains "forward-looking statements" under the Federal securities laws. These forward-looking statements address expectations or projections about the future, including our expectations regarding our future business performance and overall prospects; segment growth and the assumptions underlying our growth expectations; demand for our products; when we expect construction of our new fumed silica plant in Carrollton, Kentucky to be completed; when we expect to begin delivering product from the expansion of our plant in Cilegon, Indonesia; when we expect production of specialty carbons to begin at our new facility in Jiangsu Province, China; the sufficiency of our cash on hand, cash provided from operations and cash available under our credit and commercial paper facilities to fund our cash requirements; anticipated capital spending, including environmental-related capital expenditures; cash requirements and uses of available cash, including future cash outlays associated with long-term contractual obligations, restructurings, contributions to employee benefit plans, environmental remediation costs and future respirator liabilities; exposure to interest rate and foreign exchange risk; future benefit plan payments we expect to make; future amortization expenses; the amount and timing of the loss we expect to recognize upon the settlement of liabilities under our U.S. pension plan; the impact we expect tax reform legislation in the U.S. to have on our future after-tax earnings and tax rate; our ability to recover deferred tax assets; and the possible outcome of legal and environmental proceedings. From time to time, we also provide forward-looking statements in other materials we release to the public and in oral statements made by authorized officers.

Forward-looking statements are not guarantees of future performance and are subject to risks, uncertainties, potentially inaccurate assumptions, and other factors, some of which are beyond our control or difficult to predict. If known or unknown risks materialize, our actual results could differ materially from past results and from those expressed in the forward-looking statements. Important factors that could cause our actual results to differ materially from those expressed in our forward-looking statements are described in Item 1A in this report.

We undertake no obligation to publicly update forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law. Investors are advised, however, to consult any further disclosures we make on related subjects in our 10-Q and 8-K reports filed with the Securities and Exchange Commission (the "SEC").

PART I

Item 1. *Business*

General

Cabot is a global specialty chemicals and performance materials company headquartered in Boston, Massachusetts. Our principal products are rubber and specialty grade carbon blacks, specialty compounds, fumed metal oxides, activated carbons, inkjet colorants, and aerogel. Cabot and its affiliates have manufacturing facilities and operations in the United States ("U.S.") and over 20 other countries. Cabot's business was founded in 1882 and incorporated in the State of Delaware in 1960. The terms "Cabot", "Company", "we", and "our" as used in this report refer to Cabot Corporation and its consolidated subsidiaries.

Our vision is to be the most innovative, respected and responsible leader in our markets – delivering performance that makes a difference. Our "advancing the core" corporate strategy is to extend our leadership in performance materials by investing for growth in our core businesses, driving application innovation with our customers, and generating strong cash flows through efficiency and optimization. Our products are generally based on technical expertise and innovation in one or more of our four core competencies: making and handling very fine particles; modifying the surfaces of very fine particles to alter their functionality; designing particles to impart specific properties to a formulation; and combining particles with other ingredients to deliver a formulated performance intermediate or composite. We focus on creating particles, and formulations of those particles, with the composition, morphology, and surface functionalities to deliver the requisite performance to support our customers' existing and emerging applications.

Through June 28, 2019, our business was organized into four reportable segments: Reinforcement Materials; Performance Chemicals; Purification Solutions; and Specialty Fluids. We divested our Specialty Fluids business as of June 28, 2019 and since that time have been organized into the three remaining segments. We routinely evaluate our portfolio in light of our growth strategy and will continue to evaluate strategic options for our Purification Solutions segment. Our business segments are discussed in more detail later in this section.

Our internet address is www.cabotcorp.com. We make available free of charge on or through our website our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 as soon as reasonably practicable after electronically filing such material with, or furnishing it to, the SEC. Information appearing on our website is not a part of, and is not incorporated in, this Annual Report on Form 10-K.

Reinforcement Materials

Products

Carbon black is a form of elemental carbon that is manufactured in a highly controlled process to produce particles and aggregates of varied structure and surface chemistry, resulting in many different performance characteristics for a wide variety of applications. Rubber grade carbon blacks are used to enhance the physical properties of the systems and applications in which they are incorporated.

Our rubber blacks products are used in tires and industrial products. Rubber blacks have traditionally been used in the tire industry as a rubber reinforcing agent to increase tread durability and are also used as a performance additive to reduce rolling resistance and improve traction. In industrial products such as hoses, belts, extruded profiles and molded goods, rubber blacks are used to improve the physical performance of the product, including the product’s physical strength, fluid resistance, conductivity and resistivity.

In addition to our rubber blacks products, we manufacture compounds of carbon black and rubber using our patented elastomer composites manufacturing process. These compounds improve abrasion/wear resistance, reduce fatigue of rubber parts and reduce rolling resistance compared to carbon black/rubber compounds made by conventional dry mix methods.

Sales and Customers

Sales of rubber blacks products are made by Cabot employees and through distributors and sales representatives. Sales to six major tire customers represent a material portion of Reinforcement Materials’ total net sales and operating revenues. The loss of any of these customers, or a significant reduction in volumes sold to them, could have a material adverse effect on the segment.

Under appropriate circumstances, we have entered into supply arrangements with certain customers, the typical duration of which is one year. These arrangements typically provide for sales price adjustments to account for changes in relevant feedstock indices and, in some cases, changes in other relevant costs (such as the cost of natural gas). In fiscal 2019, approximately half of our rubber blacks volume was sold under these supply arrangements. The majority of the volumes sold under these arrangements are sold to customers in the Americas and Europe.

We licensed our patented elastomer composites manufacturing process to Manufacture Francaise des Pneumatiques Michelin for their exclusive use in tire applications through fiscal 2017, and for a period of limited exclusivity in tire applications through fiscal 2019. As consideration, we receive quarterly royalty payments extending through calendar year 2022.

Much of the rubber blacks we sell is used in tires and automotive products and, therefore, our financial results may be affected by the cyclical nature of the automotive industry. However, a large portion of the market for our products is in replacement tires that historically have been less subject to automotive industry cycles.

Competition

We are one of the leading manufacturers of carbon black in the world. We compete in the sale of carbon black with four companies that operate globally and numerous other companies that operate regionally, a number of which export product outside their country. Competition for our Reinforcement Materials products is based on product performance, quality, reliability, price, service, technical innovation, and logistics. We believe our product differentiation, technological leadership, global manufacturing presence, operations and logistics excellence and customer service provide us with a competitive advantage.

Raw Materials

The principal raw material used in the manufacture of carbon black is composed of residual heavy oils derived from petroleum refining operations, the distillation of coal tars, and the production of ethylene throughout the world. Natural gas is also used in the production of carbon black. Raw materials are, in general, readily available and in adequate supply. Raw material costs generally are influenced by the availability of various types of carbon black feedstock and natural gas, supply and demand of such raw materials and related transportation costs.

Operations

We own, or have a controlling interest in, and operate plants that produce rubber blacks in Argentina, Brazil, Canada, China, Colombia, the Czech Republic, France, Indonesia, Italy, Japan, Mexico, the Netherlands and the U.S. An equity affiliate operates a carbon black plant in Venezuela.

The following table shows our ownership interest as of September 30, 2019 in rubber blacks operations in which we own less than 100%:

Location	Percentage Interest
Shanghai, China	70% (consolidated subsidiary)
Tianjin, China	70% (consolidated subsidiary)
Xingtai City, China	60% (consolidated subsidiary)
Valasske Mezirici (Valmez), Czech Republic	52% (consolidated subsidiary)
Cilegon, Indonesia	98% (consolidated subsidiary)
Valencia, Venezuela	49% (equity affiliate)

During fiscal 2019, we began engineering work on an expansion of our Cilegon, Indonesia plant, which will add approximately 90,000 metric tons of capacity to our network. We anticipate that product from this expansion will be available for sale starting in 2021.

Performance Chemicals

Our Performance Chemicals reporting segment is organized into two businesses: our Performance Additives business and our Formulated Solutions business. Our Performance Additives business combines our specialty grades of carbon black, fumed metal oxides and aerogel product lines, and our Formulated Solutions business combines our specialty compounds and inkjet product lines.

In Performance Chemicals, we design, manufacture and sell materials that deliver performance in a broad range of customer applications across the automotive, construction, infrastructure, energy, inkjet printing, electronics, and consumer products sectors. Our focus areas for growth include carbon additives and other materials for battery applications, inks and dispersions for packaging applications, and conductive compounds for various plastics applications.

Products

Performance Additives Business

Carbon black is a form of elemental carbon that is manufactured in a highly controlled process to produce particles and aggregates of varied structure and surface chemistry, resulting in many different performance characteristics for a wide variety of applications.

Our specialty grades of carbon black are used to impart color, provide rheology control, enhance conductivity and static charge control, provide UV protection, enhance mechanical properties, and provide formulation flexibility through surface treatment. These specialty carbon products are used in a wide variety of applications, such as inks, coatings, plastics, adhesives, toners, batteries, and displays.

Fumed silica is an ultra-fine, high-purity particle used as a reinforcing, thickening, abrasive, thixotropic, suspending or anti-caking agent in a wide variety of products for the automotive, construction, microelectronics, batteries, and consumer products industries. These products include adhesives, sealants, cosmetics, batteries, inks, toners, silicone elastomers, coatings, polishing slurries and pharmaceuticals. Fumed alumina, also an ultra-fine, high-purity particle, is used as an abrasive, absorbent or barrier agent in a variety of products, such as inkjet media, lighting, coatings, cosmetics and polishing slurries.

Aerogel is a hydrophobic, silica-based particle with a high surface area that is used in a variety of thermal insulation and specialty chemical applications. In the building and construction industry, the product is used in insulative sprayable plasters and composite building products, as well as translucent skylight, window, wall and roof systems for insulating eco-daylighting applications. In the specialty chemicals industry, the product is used to provide matte finishing, insulating and thickening properties for use in a variety of applications.

Formulated Solutions Business

Our masterbatch and conductive compound products, which we refer to as “specialty compounds”, are formulations derived from specialty grades of carbon black mixed with polymers and other additives. These products are generally used by plastic resin producers and converters in applications for the automotive, industrial, packaging, infrastructure, agriculture, consumer products, and electronics industries. As an alternative to directly mixing specialty carbon blacks, these formulations offer greater ease of handling and help customers achieve their desired levels of dispersion and color and manage the addition of small doses of additives. In addition, our electrically conductive compound products generally are used to help ensure uniform conductive performance and reduce risks associated with electrostatic discharge in plastics applications.

Our inkjet colorants are high-quality pigment-based black and color dispersions based on our patented carbon black surface modification technology. The dispersions are used in aqueous inkjet inks to impart color, sharp print characteristics and durability, while maintaining high printhead reliability. These products are used in various inkjet printing applications, including commercial printing, small office/home office and corporate office, that all require a high level of dispersibility and colloidal stability. Our inkjet inks, which utilize our pigment-based colorant dispersions, are used in the commercial printing segment for digital print.

Sales and Customers

Sales of these products are made by Cabot employees and through distributors and sales representatives. In our specialty carbons and specialty compounds product lines, sales are generally to a broad number of customers. In our fumed metal oxides product line, sales under contracts with two customers have accounted for a substantial portion of the revenue.

Competition

We are a leading producer of the products we sell in this segment. We compete in the sale of carbon black with four companies that operate globally and numerous other companies that operate regionally, a number of which export product outside their region. For fumed silica, we compete primarily with two companies with a global presence and several other companies which have a regional presence. For aerogel, we compete principally with one other company that produces aerogel products. We also compete with non-aerogel insulation products manufactured by regional companies throughout the world. For specialty compounds, competition is fragmented and we compete with many regional companies and a small number of global companies. Our inkjet colorants and inks are designed to replace traditional pigment dispersions and dyes used in inkjet printing applications. Competitive products for inkjet colorants are organic dyes and other dispersed pigments manufactured and marketed by large chemical companies and small independent producers.

Competition for our Performance Chemicals products is based on product performance, quality, reliability, service, technical innovation and price. We believe our product differentiation, technological leadership, operations excellence and customer service provide us with a competitive advantage.

Raw Materials

Raw materials for our products are, in general, readily available and in adequate supply. The principal raw material used in the manufacture of carbon black is composed of residual heavy oils derived from petroleum refining operations, the distillation of coal tars, and the production of ethylene throughout the world. Natural gas is also used in the production of carbon black. These raw material costs generally are influenced by the availability of various types of carbon black feedstock and natural gas, supply and demand of such raw materials and related transportation costs.

Raw materials for the production of fumed silica are various chlorosilane feedstocks. We purchase feedstocks and for certain customers convert their feedstock to product on a fee-basis (so called "toll conversion"). We also purchase aluminum chloride as feedstock for the production of fumed alumina. We have long-term procurement contracts or arrangements in place for the purchase of fumed silica feedstock, which we believe will enable us to meet our raw material requirements for the foreseeable future. In addition, we buy some raw materials in the spot market to help ensure flexibility and minimize costs. The principal raw materials for the production of aerogel are silica sol and/or sodium silicate.

The primary raw materials used for our specialty compounds include carbon black, primarily sourced from our carbon black plants, prime and recycled thermoplastic resins and mineral fillers supplied from various sources. Raw materials for inkjet colorants include carbon black sourced from our carbon black plants, organic pigments and other treating agents available from various sources. Raw materials for inkjet inks include pigment dispersions, solvents and other additives.

Operations

We own, or have a controlling interest in, and operate plants that produce specialty grades of carbon black primarily in China, the Netherlands and the U.S. We also own, or have a controlling interest in, manufacturing plants that produce fumed metal oxides in China, Germany, the United Kingdom ("U.K"), and the U.S. and a manufacturing plant that produces aerogel in Frankfurt, Germany. An equity affiliate operates a fumed metal oxides plant in India. Our specialty compounds are predominately produced in facilities that we own, or have a controlling interest in, located in Belgium, Canada, China and the United Arab Emirates. Our inkjet colorants and inks are manufactured at our facility in the U.S.

The following table shows our ownership interest as of September 30, 2019 in these segment operations in which we own less than 100%:

Location	Percentage Interest
Tianjin, China	90% (consolidated subsidiary)
Jiangxi Province, China	90% (consolidated subsidiary)
Wuhai, China	80% (consolidated subsidiary)
Mettur Dam, India	50% (equity affiliate)

We are investing for growth in our core businesses with a number of capacity expansion projects. In September 2018, we acquired NSCC Carbon (Jiangsu) Co., Ltd. from Nippon Steel Carbon Co., Ltd., a subsidiary of Nippon Steel Chemical & Material Co., Ltd., adding to our portfolio a 50,000-metric ton facility in Pizhou, Jiangsu Province, China. We plan to modify this facility to produce specialty carbons, and expect production to begin in 2021. In addition, during fiscal 2018, we purchased Tech Blend, a leading North American producer of black masterbatches, extending our geographic footprint in black masterbatch and compounds. The acquisition added a manufacturing facility in Saint-Jean-sur-Richelieu, Québec, Canada to our manufacturing network. In June 2019, we acquired certain intangible assets from a leading masterbatch producer in Asia, which extends our global footprint in black masterbatch.

We also continue to expand our fumed silica manufacturing capacity, with new plants in Wuhai, China and Carrollton, Kentucky, U.S. In fiscal 2019, we completed construction and began operations at our facility in Wuhai, and we expect construction of our facility in Carrollton, which is adjacent to DowDuPont's existing silicone monomer plant, to be completed in 2020.

Purification Solutions

Products

Activated carbon is a porous material consisting mainly of elemental carbon treated with heat, steam and/or chemicals to create high internal porosity, resulting in a large internal surface area that resembles a sponge. It is generally produced in two forms, powdered and granular, and is manufactured in different sizes, shapes and levels of purity and using a variety of raw materials for a wide variety of applications. Activated carbon is used to remove contaminants from liquids and gases using a process called adsorption, whereby the interconnected pores of activated carbon trap contaminants.

Our activated carbon products are used for the purification of water, air, food and beverages, pharmaceuticals and other liquids and gases, as either a colorant or a decolorizing agent in the manufacture of products for food and beverage applications and as a chemical carrier in slow release applications. In gas and air applications, one of the uses of activated carbon is for the removal of mercury in flue gas streams. In certain applications, used activated carbon can be reactivated for further use by removing the contaminants from the pores of the activated carbon product. The most common applications for our reactivated carbon are water treatment and food and beverage purification. In addition to our activated carbon production and reactivation, we also provide activated carbon solutions through on-site equipment and services, including delivery systems for activated carbon injection in coal-fired utilities, mobile water filter units and carbon reactivation services.

Sales and Customers

Sales of activated carbon are made by Cabot employees and through distributors and sales representatives to a broad range of customers, including coal-fired utilities, food and beverage processors, water treatment plants, pharmaceutical companies and catalyst producers. Some of our sales of activated carbon are made under annual contracts or longer-term agreements, particularly in mercury removal applications.

Competition

We are one of the leading manufacturers of activated carbon in the world. We compete in the manufacture of activated carbon with a number of companies, some of which have a global presence and others that have a regional or local presence, although not all of these companies manufacture activated carbon for the range of applications for which we sell our products.

Competition for activated carbon and activated carbon equipment and services is based on quality, price, performance, and supply-chain stability. We believe our commercial strengths include our product and application diversity, product differentiation, technological leadership, and quality.

Raw Materials

The principal raw materials we use in the manufacture of activated carbon are various forms of coal, including lignite, wood and other carbonaceous materials, which are, in general, readily available and we believe we have in adequate supply. We also own a lignite mine that is operated by Caddo Creek Resources Company, LLC, a subsidiary of the North American Coal Company, which supplies our Marshall, Texas facility.

Operations

We own, or have a controlling interest in, and operate plants that produce activated carbon in Italy, the Netherlands, the U.K. and the U.S. We also have joint venture interests in activated carbon plants in Canada and Mexico, and a reactivation plant in Singapore. The following table shows our ownership interest as of September 30, 2019 in activated carbon operations in which we own less than 100%:

Location	Percentage Interest
Estevan, Saskatchewan, Canada	50% (contractual joint venture)
Atitalaquia, Hidalgo, Mexico	49% (equity affiliate)
Republic of Singapore	35% (equity affiliate)

Specialty Fluids

We divested our Specialty Fluids business on June 28, 2019. Refer to Note D of the Notes to our Consolidated Financial Statements for the terms of this transaction.

Our Specialty Fluids segment produced and marketed a range of cesium products that included cesium formate brines and other fine cesium chemicals. Cesium formate brines are used as a drilling and completion fluid primarily in high pressure and high temperature oil and gas well construction. Fine cesium chemicals are used across a wide range of industries and applications that include catalysts, doping agents and brazing fluxes.

We sold our cesium formate products to oil and gas operating companies directly by Cabot employees and sales representatives and indirectly through oil field service companies. We generally rented cesium formate to our customers for use in drilling operations on a short-term basis and on occasion made direct sales of cesium formate outside of the rental process. After completion of a job under our rental process, the customer returned the remaining fluid to Cabot and it was reprocessed for use in subsequent well operations. Any fluid that was not returned to Cabot was paid for by the customer.

Formate fluids compete mainly with traditional drilling fluid technologies. Competition in the well fluids business is based on product performance, quality, reliability, service, technical innovation, price, and proximity of inventory to customers' drilling operations.

The principal raw material used in this business is pollucite (cesium ore). Prior to our sale of this business we owned a substantial portion of the world's known reserves of cesium ore at our mine in Manitoba, Canada.

Most oil and gas well construction jobs for which cesium formate is used require a large volume of the product. Accordingly, our Specialty Fluids business maintained a large supply of fluid.

Our mine and cesium formate and fine cesium chemical manufacturing facility were located in Manitoba, Canada, and we had fluid blending and reclamation facilities in Aberdeen, Scotland and in Bergen, Norway. In addition, we warehoused fluid and fine cesium chemical products at various locations around the world to support existing and potential operations.

Patents and Trademarks

We own and are a licensee of various patents, which expire at different times, covering many of our products as well as processes and product uses. Although the products made and sold under these patents and licenses are important to Cabot, the loss of any particular patent or license would not materially affect our business, taken as a whole. We sell our products under a variety of trademarks we own and take reasonable measures to protect them. While our trademarks are important to Cabot, the loss of any one of our trademarks would not materially affect our business, taken as a whole.

Seasonality

Our businesses are generally not seasonal in nature, although we may experience some regional seasonal declines during holiday periods and some weather-related seasonality in Purification Solutions.

Backlog

We do not consider backlog to be a significant indicator of the level of future sales activity. In general, we do not manufacture our products against a backlog of orders. Production and inventory levels are based on the level of incoming orders as well as projections of future demand. Therefore, we believe that backlog information is not material to understanding our overall business and is not a reliable indicator of our ability to achieve any particular level of revenue or financial performance.

Employees

As of September 30, 2019, we had approximately 4,500 employees. Some of our employees in the U.S. and abroad are covered by collective bargaining or similar agreements. We believe that our relations with our employees are generally satisfactory.

Safety, Health and Environment ("SH&E")

Cabot has been named as a potentially responsible party under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (the "Superfund law") and comparable state statutes with respect to several sites primarily associated with our divested businesses. (See "Legal Proceedings" below.) During the next several years, as remediation of various environmental sites is carried out, we expect to spend against our $13 million environmental reserve for costs associated with such remediation. Adjustments are made to the reserve based on our continuing analysis of our share of costs likely to be incurred at each site. Inherent uncertainties exist in these estimates due to unknown conditions at the various sites, changing governmental regulations and legal standards regarding liability, and changing technologies for handling site investigation and remediation. While the reserve represents our best estimate of the costs we expect to incur, the actual costs to investigate and remediate these sites may exceed the amounts accrued in the environmental reserve. While it is always possible that an unusual event may occur with respect to a given site and have a material adverse effect on our results of operations in a particular period, we do not believe that the costs relating to these sites, in the aggregate, are likely to have a material adverse effect on our consolidated financial position. Furthermore, it is possible that we may also incur future costs relating to environmental liabilities not currently known to us or as to which it is currently not possible to make an estimate.

Our ongoing operations are subject to extensive federal, state, local, and foreign laws, regulations, rules, and ordinances relating to safety, health, and environmental matters ("SH&E Requirements"). These SH&E Requirements include requirements to obtain and comply with various environmental-related permits for constructing any new facilities and operating all of our existing facilities and for product registrations. We have expended and will continue to expend considerable sums to construct, maintain, operate, and improve facilities for safety, health and environmental protection and to comply with SH&E Requirements. We spent approximately $26 million in environmental-related capital expenditures at existing facilities in fiscal 2019. We anticipate spending approximately $58 million for such matters in fiscal 2020, a significant portion of which will be for the installation of air pollution control equipment and wastewater infrastructure improvements at certain of our plants.

In recognition of the importance of compliance with SH&E Requirements to Cabot, our Board of Directors has a Safety, Health, Environment, and Sustainability Committee. The Committee, which is comprised of a majority of independent directors, meets regularly and oversees aspects of our sustainability program, including safety, health, and environmental performance, process safety, security, product stewardship, community engagement and governmental affairs. In particular, the Committee reviews metrics, audit results, emerging trends, overall performance, risks and opportunity assessments and management processes related to our safety, health, environmental and sustainability program.

The International Agency for Research on Cancer ("IARC") classifies carbon black as a Group 2B substance (known animal carcinogen, possible human carcinogen). We have communicated IARC's classification of carbon black to our customers and employees and have included that information in our safety data sheets and elsewhere, as appropriate. We continue to believe that the available evidence, taken as a whole, indicates that carbon black is not carcinogenic to humans, and does not present a health hazard when handled in accordance with good housekeeping and safe workplace practices as described in our safety data sheets.

REACH (Registration, Evaluation and Authorization of Chemicals), the European Union ("EU") regulatory framework for chemicals developed by the European Commission ("EC"), applies to all chemical substances produced or imported into the EU in quantities of one metric ton a year or more. Manufacturers or importers of these chemical substances are required to submit specified health, safety, risk and use information about the substance to the European Chemical Agency ("ECHA"). We have completed all required registrations under REACH to date and will update registration dossiers as needed. Under the evaluation portion of REACH, ECHA and EU member states assess the information submitted in registration dossiers and testing proposals to determine whether the substances are safe for use. Silica is currently being evaluated and carbon black is scheduled for review in 2022. In addition, the EC is working on re-defining nanomaterial. ECHA is developing guidance on nanomaterials and additional requirements for nanomaterials that apply to many of our existing products, including carbon black, fumed silica, inkjet pigments and fumed alumina. Country-specific nanomaterial reporting programs have been implemented in some countries and are being developed by others. We will continue to monitor and address these requirements.

Environmental agencies worldwide are increasingly implementing regulations and other requirements resulting in more restrictive air emission limits globally, particularly as they relate to nitrogen oxide, sulphur dioxide and particulate matter emissions. In addition, global efforts to reduce greenhouse gas emissions impact the carbon black and activated carbon industries as carbon dioxide is emitted from those manufacturing processes. In Europe, the EU Emission Trading Scheme applies to our four carbon black facilities and one activated carbon facility. In China, two of our carbon black facilities participate in regional pilot greenhouse gas emissions trading programs associated with the development of a national trading program. The national program was implemented on a limited scale in 2018 and 2019, with broader applicability expected in 2020. In Canada, our carbon black manufacturing facility was subject to the Province of Ontario's emissions trading program, which was eliminated in 2018. That facility is now subject to the backstop Canadian carbon tax program. In Mexico, our carbon black facility is subject to the recently approved cap and trade pilot program. In other regions where we operate, some of our facilities are required to report their greenhouse gas emissions, but are not currently subject to programs requiring trading or emission controls. We generally expect to pay any incurred taxes or purchase emission credits, as needed, to respond to any allocation shortfalls. In addition, air emission regulations may be adopted in the future in other regions and countries where we operate, which could have an impact on our operations. Increasing regulatory programs associated with greenhouse gas emissions and concerns regarding climate change could increase our operational costs in the future.

A number of organizations and regulatory agencies have become increasingly focused on the issue of water scarcity and water quality, particularly in certain geographic regions. We are engaged in various activities to promote water conservation and wastewater recycling. The costs associated with these activities are not expected to have a material adverse effect on our operations.

Various U.S. agencies and international bodies have adopted security requirements applicable to certain manufacturing and industrial facilities and marine port locations. These security-related requirements involve the preparation of security assessments and security plans in some cases, and in other cases the registration of certain facilities with specified governmental authorities. We closely monitor all security-related regulatory developments and believe we are in compliance with all existing requirements. Compliance with such requirements is not expected to have a material adverse effect on our operations.

Item 1A. *Risk Factors*

In addition to factors described elsewhere in this report, the following are important factors that could adversely affect our business. The risks described below are not the only risks we face. Additional risks not presently known to us or that we currently deem immaterial may also impair our business operations and financial results.

Industry Risks

Industry capacity utilization and competition from other specialty chemical companies may adversely impact our business.

Our businesses are sensitive to industry capacity utilization, and pricing tends to fluctuate when capacity utilization changes occur, which could affect our financial performance. Further, we operate in a highly competitive marketplace. Our ability to compete successfully depends in part upon our ability to maintain a superior technological capability and to continue to identify, develop and commercialize new and innovative, high value-added products for existing and future customers. Increased competition from existing or newly developed products offered by our competitors or companies whose products offer a similar functionality as our products and could be substituted for our products, may negatively affect demand for our products. In addition, actions by our competitors could impair our ability to maintain or raise prices, successfully enter new markets or maintain or grow our market position.

Volatility in the price and availability of raw materials and energy could impact our margins and working capital.

Our manufacturing processes consume significant amounts of energy and raw materials, the costs of which are subject to worldwide supply and demand as well as other factors beyond our control. Our carbon black businesses use a variety of feedstocks as raw material including high sulfur fuel oils, low sulfur fuel oils, coal tar distillates, and ethylene cracker residue, the cost and availability of which vary, based in part on geography. Significant movements or volatility in our carbon black feedstock costs could have an adverse effect on our working capital and results of operations. In addition, regulatory changes may impact the prices of our feedstocks. For example, the International Maritime Organization regulation known as MARPOL will further restrict the sulfur emissions for the shipping industry beginning January 1, 2020. This has impacted the prices and could impact the availability of certain fuel oils we use as feedstock for our products.

Certain of our carbon black supply arrangements contain provisions that adjust prices to account for changes in relevant feedstock and natural gas price indices. We also attempt to offset the effects of increases in raw material and energy costs through selling price increases in our non-contract sales, productivity improvements and cost reduction efforts. Success in offsetting increased raw material and energy costs with price increases is largely influenced by competitive and economic conditions and could vary significantly depending on the segment served. Such increases may not be accepted by our customers, may not be sufficient to compensate for increased raw material and energy costs or may decrease demand for our products and our volume of sales. If we are not able to fully offset the effects of increased raw material or energy costs, it could have a significant impact on our financial results. Rapid declines in energy and raw material costs can also negatively impact our financial results, as such changes can negatively affect the returns we receive on our energy centers and yield improvement investments, and may negatively impact our contract pricing adjustments. In addition, we use a variety of feedstock indices in our supply arrangements to adjust our prices for changes in raw materials costs. Depending on feedstock markets and our choice of feedstocks, the indices we use in our supply arrangements may not precisely track our actual costs. This could result in an incongruity between our pricing adjustments and changes in our actual feedstock costs, which can affect our margins.

In addition, we obtain certain of our raw materials from selected key suppliers. Although we maintain raw material inventory, if any of these suppliers is unable to meet its obligations under supply agreements with us on a timely basis or at an acceptable price, or at all, we may be forced to incur higher costs to obtain the necessary raw materials elsewhere or, in certain limited cases, may not be able to obtain the required raw materials.

A significant adverse change in a customer relationship or the failure of a customer to perform its obligations under agreements with us could harm our business or cash flows.

Our success in strengthening relationships and growing business with our largest customers and retaining their business over extended time periods is important to our future results. We have a group of key customers across our businesses that together represent a significant portion of our total net sales and operating revenues. The loss of any of our important customers, or a significant reduction in volumes sold to them, could adversely affect our results of operations until such business is replaced or any temporary disruption ends. Further, in our Reinforcement Materials segment we enter into supply arrangements with a number of key customers that typically have a duration of one year, which account for approximately half of our total rubber blacks volumes. Our success in negotiating the price and volume terms under these arrangements could have a material effect on our results. In addition, any deterioration in the financial condition of any of our customers that impairs our customers' ability to make payments to us also could increase our uncollectible receivables and could affect our future results and financial condition.

We are exposed to political or country risk inherent in doing business in some countries.

Sales outside of the U.S. constituted a majority of our revenues in fiscal 2019. We conduct business in several countries that have less stable legal systems and financial markets, and potentially more corrupt business environments than the U.S. Our operations in some countries are subject to the following risks: changes in the rate of economic growth; unsettled political or economic conditions; non-renewal of operating permits or licenses; possible expropriation or other governmental actions; corruption by government officials and other third parties; social unrest, war, terrorist activities or other armed conflict; confiscatory taxation or other adverse tax policies; deprivation of contract rights; trade regulations affecting production, pricing and marketing of products; reduced protection of intellectual property rights; restrictions or additional costs associated with repatriating cash; exchange controls; inflation; currency fluctuations and devaluation; the effect of global health, safety and environmental matters on economic conditions and market opportunities; and changes in financial policy and availability of credit.

The Chinese government has, from time to time, curtailed manufacturing operations, without notice, in industrial regions out of growing concern over air quality. The timing and length of these curtailments are difficult to predict and, at times, are applied to manufacturing operations without regard to whether the operations being curtailed comply with environmental regulations in the area. Accordingly, our manufacturing operations in China may be subject to these curtailments. These events could negatively impact our results of operations and cash flows both during and after the period of any curtailment affecting our operations.

Operational Risks

Our operations and products are subject to extensive safety, health and environmental requirements, which could increase our costs and/or impair our ability to manufacture and sell certain products.

Our ongoing operations are subject to extensive federal, state, local and foreign laws, regulations, rules and ordinances relating to safety, health and environmental matters, many of which provide for substantial monetary fines and criminal sanctions for violations. These include requirements to obtain and comply with various environmental-related and other permits for constructing any new facilities and operating all of our existing facilities. Environmental regulatory changes and restrictions could impose constraints on our operations, and threaten our competitive position. In addition, in certain geographic areas, our carbon black and activated carbon facilities are or may become subject to greenhouse gas emission trading schemes or carbon tax programs under which we may be required to pay any incurred taxes or purchase emission credits if our emission levels exceed our free allocation. Costs of complying with regulations could increase as concerns related to greenhouse gases and climate change continue to emerge. The enactment of new environmental laws and regulations and/or the more aggressive interpretation of existing requirements could require us to incur significant costs for compliance or capital improvements or limit our current or planned operations, any of which could have a material adverse effect on our earnings or cash flow. (See “Legal Proceedings” in Item 3 below). We attempt to offset the effects of these compliance costs through price increases, productivity improvements and cost reduction efforts. Success in offsetting any such increased regulatory costs is largely influenced by competitive and economic conditions and could vary significantly depending on the segment served. Such increases may not be accepted by our customers, may not be sufficient to compensate for increased regulatory costs or may decrease demand for our products and our volume of sales.

In order to secure and maintain the right to produce or sell our products, we must satisfy product related regulatory requirements in different jurisdictions. Obtaining and maintaining these approvals requires a significant amount of product testing and data, and there is no certainty these approvals will be obtained.

Certain national and international health organizations have classified carbon black as a possible or suspected human carcinogen. To the extent that, in the future, (i) these organizations re-classify carbon black as a known or confirmed carcinogen, (ii) other organizations or government authorities in other jurisdictions classify carbon black or any of our other finished products, raw materials or intermediates as suspected or known carcinogens or otherwise hazardous, or (iii) there is discovery of adverse health effects attributable to production or use of carbon black or any of our other finished products, raw materials or intermediates, we could be required to incur significantly higher costs to comply with environmental, health and safety laws, or to comply with restrictions on sales of our products, be subject to legal claims, and our reputation and business could be adversely affected. In addition, chemicals that are currently classified as non-hazardous may be classified as hazardous in the future, and our products may have characteristics that are not recognized today but may be found in the future to impair human health or to be carcinogenic.

As a chemical manufacturing company, our operations are subject to operational risks and have the potential to cause environmental or other damage as well as personal injury, which could adversely affect our business, results of operations and cash flows.

The operation of a chemical manufacturing business as well as the sale and distribution of chemical products are subject to operational as well as safety, health and environmental risks. For example, the production and/or processing of carbon black, specialty compounds, fumed metal oxides, aerogel, activated carbon and other chemicals involve the handling, transportation, manufacture or use of certain substances or components that may be considered toxic or hazardous. Our manufacturing processes and the transportation of our chemical products and/or the raw materials used to manufacture our products are subject to risks inherent in chemical manufacturing, including leaks, fires, explosions, toxic releases, mechanical failures or unscheduled downtime. In addition, at our lignite mine, we have operational risks associated with the maintenance and operation of the heavy equipment required to dig and haul the lignite, and risks relating to lower than expected lignite quality or recovery rates. If operational risks materialize, they could result in injury or loss of life, damage to the environment, or damage to property, including mineral properties. In addition, the occurrence of material operating problems at our facilities or a disruption in our supply chain or distribution operations may result in loss of production, which, in turn, may make it difficult for us to meet customer needs. Accordingly, these events and their consequences could negatively impact our results of operations and cash flows, both during and after the period of operational difficulties, and could harm our reputation.

An interruption in our operations as a result of fence-line arrangements could disrupt our manufacturing operations and adversely affect our financial results.

At certain of our facilities we have fence-line arrangements with adjacent third party manufacturing operations (“fence-line partners”), who provide raw materials for our manufacturing operations and/or take by-products generated from our operations. Accordingly, any disruptions or curtailments in a fence-line partner’s production facilities that impacts their ability to supply us with raw materials or to take our manufacturing by-products could disrupt our manufacturing operations or cause us to incur increased operating costs to mitigate such disruption.

Information technology systems failures, data security breaches or network disruptions could compromise our information, disrupt our operations and expose us to liability, which may adversely impact our operations.

In the ordinary course of our business, we store sensitive data, including intellectual property, our proprietary business information and certain information of our customers, suppliers, business partners, and employees in our information technology systems. The secure processing, maintenance and transmission of this data is critical to our operations. Information technology systems failures, including risks associated with upgrading our systems or in successfully integrating information technology and other systems in connection with the integration of businesses we acquire, network disruptions or unauthorized access could disrupt our operations by impeding our processing of transactions and our financial reporting, and our ability to protect our customer or company information, which could have a material adverse effect on our business or results of operations. In addition, as with all enterprise information systems, our information technology systems could be penetrated by outside parties intent on extracting information, corrupting information, or disrupting business processes. Breaches of our security measures or the accidental loss, inadvertent disclosure, or unapproved dissemination of proprietary information or sensitive or confidential information about the Company, our employees, our vendors, or our customers, could result in legal claims or proceedings and potential liability for us, and damage to our reputation, and could otherwise harm our business and our results of operations.

Natural disasters could affect our operations and financial results.

We operate facilities in areas of the world that are exposed to natural hazards, such as floods, windstorms, hurricanes, and earthquakes. Extreme weather events present physical risks that may become more frequent as a result of factors related to climate change. Such events could disrupt our supply of raw materials or otherwise affect production, transportation and delivery of our products or affect demand for our products.

Technology Risks

We may not be successful achieving our growth expectations from new products, new applications and technology developments, and money we spend on these efforts may not result in an increase in revenues or profits commensurate with our investment.

We may not be successful achieving our growth expectations from developing new products or product applications. Moreover, we cannot be certain that the costs we incur investing in new product and technology development will result in an increase in revenues or profits commensurate with our investment. In addition, the timely commercialization of products that we are developing may be disrupted or delayed by manufacturing or other technical difficulties, market acceptance or insufficient market size to support a new product, competitors' new products, and difficulties in moving from the experimental stage to the production stage. These disruptions or delays could affect our future business results.

The continued protection of our patents, trade secrets and other proprietary intellectual property rights are important to our success.

Our patents, trade secrets and other intellectual property rights are important to our success and competitive position. We own various patents and other intellectual property rights in the U.S. and other countries covering many of our products, as well as processes and product uses. Where we believe patent protection is not appropriate or obtainable, we rely on trade secret laws and practices to protect our proprietary technology and processes, such as physical security, limited dissemination and access and confidentiality agreements with our employees, customers, consultants, business partners, potential licensees and others to protect our trade secrets and other proprietary information. However, trade secrets can be difficult to protect and the protective measures we have put in place may not prevent disclosure or unauthorized use of our proprietary information or provide an adequate remedy in the event of misappropriation or other violations of our proprietary rights. In addition, we are a licensee of various patents and intellectual property rights belonging to others in the U.S. and other countries. Because the laws and enforcement mechanisms of some countries may not allow us to protect our proprietary rights to the same extent as we are able to do in the U.S., the strength of our intellectual property rights will vary from country to country.

Irrespective of our proprietary intellectual property rights, we may be subject to claims that our products, processes or product uses infringe the intellectual property rights of others. These claims, even if they are without merit, could be expensive and time consuming to defend and if we were to lose such claims, we could be enjoined from selling our products or using our processes and/or be subject to damages, or be required to enter into licensing agreements requiring royalty payments and/or use restrictions. Licensing agreements may not be available to us, or if available, may not be available on acceptable terms.

Portfolio Management, Capacity Expansion and Integration Risks

Any failure to realize benefits from acquisitions, alliances or joint ventures or to achieve our portfolio management objectives could adversely affect future financial results.

In achieving our strategic plan objectives, we may pursue acquisitions, alliances or joint ventures intended to complement or expand our existing businesses globally or add product technology, or both. The success of acquisitions of businesses, new technologies and products, or arrangements with third parties is not always predictable and we may not be successful in realizing our objectives as anticipated. We may not be able to integrate any 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 results. In addition to strategic acquisitions we evaluate our portfolio in light of our objectives and alignment with our growth strategy. In implementing this strategy we may not be successful in separating non-strategic assets. The gains or losses on the divestiture of, or lost operating income from, such assets may affect our earnings. Moreover, we may incur asset impairment charges related to acquisitions or divestitures that reduce earnings.

Plant capacity expansions and site development projects may impact existing plant operations, be delayed and/or not achieve the expected benefits.

Our ability to complete capacity expansions and site development projects as planned may be delayed or interrupted by the need to obtain environmental and other regulatory approvals, unexpected cost increases, availability of labor and materials, unforeseen hazards such as weather conditions, and other risks customarily associated with construction projects. These risks include the risk that existing plant operations are disrupted, which could make it difficult for us to meet our customer needs. Moreover, in the case of capacity expansions, the cost of these activities could have a negative impact on the financial performance of the relevant business until capacity utilization at the particular facility is sufficient to absorb the incremental costs associated with an expansion. In addition, our ability to expand capacity in emerging regions depends in part on economic and political conditions in these regions and, in some cases, on our ability to establish operations, construct additional manufacturing capacity or form strategic business alliances.

Financial Risks

Negative or uncertain worldwide or regional economic conditions or trade relations may adversely impact our business.

Our operations and performance are affected by worldwide and regional economic conditions. Uncertainty or a deterioration in the economic conditions affecting the businesses to which, or geographic areas in which, we sell products could reduce demand for our products. We may also experience pricing pressure on products and services, which could decrease our revenues and have an adverse effect on our financial condition and cash flows. In addition, during periods of economic uncertainty, our customers may temporarily pursue inventory reduction measures that exceed declines in the actual underlying demand.

In addition, changes in, or tensions relating to, U.S. trade relations with countries where we do business may adversely impact our business. For example, current tensions in the U.S.-China trade relationship have led to the implementation by both countries of higher tariffs on imported goods from the other. The uncertainty created by these trade tensions has negatively affected the buying behavior of our customers, lowering industry demand and creating a more competitive pricing environment for our products. If there is no satisfactory progress on trade negotiations between the countries, there could be further adverse implications on our businesses and operating results in both the U.S. and China. For instance, we may encounter unexpected operating difficulties in China, more restrictive investment opportunities in China, greater difficulty transferring funds, or negative currency impacts. Further, the cost of our capital projects may be higher than anticipated because of these trade tariffs.

Litigation or legal proceedings could expose us to significant liabilities and thus negatively affect our financial results.

As more fully described in “Legal Proceedings” in Item 3 below, we are a party to or the subject of lawsuits, claims, and proceedings, including, but not limited to, those involving environmental, and health and safety matters as well as product liability and personal injury claims relating to asbestosis, silicosis, and coal worker’s pneumoconiosis. We are also a potentially responsible party in various environmental proceedings and remediation matters wherein substantial amounts are at issue. Adverse rulings, judgments or settlements in pending or future litigation (including liabilities associated with respirator claims) or in connection with environmental remediation activities could adversely affect our financial results or cause our results to differ materially from those expressed or forecasted in any forward-looking statements.

Our tax rate is dependent upon a number of factors, a change in any of which could impact our future tax rates and net income.

Our future tax rates may be adversely affected by a number of factors, including: changes in the jurisdictions in which our profits are determined to be earned and taxed; changes in the estimated realization of our net deferred tax assets; the repatriation of non-U.S. earnings for which we have not previously provided for non-U.S. withholding taxes; adjustments to estimated taxes upon finalization of various tax returns; increases in expenses that are not deductible for tax purposes; changes in available tax credits; the resolution of issues arising from tax audits with various tax authorities; and changes in tax laws or the interpretation of such tax laws. For example, we expect recent changes in tax rates in Switzerland will increase our tax rate going forward. In addition, losses for which no tax benefits can be recorded could materially impact our tax rate and its volatility from one quarter to another.

Fluctuations in foreign currency exchange and interest rates affect our financial results.

We earn revenues, pay expenses, own assets and incur liabilities in countries using currencies other than the U.S. dollar. In fiscal 2019, we derived a majority of our revenues from sales outside the U.S. Because our consolidated financial statements are presented in U.S. dollars, we must translate revenues and expenses, as well as assets and liabilities, into U.S. dollars at exchange rates in effect during or at the end of each reporting period. Therefore, increases or decreases in the value of the U.S. dollar against other currencies in countries where we operate will affect our results of operations and the value of balance sheet items denominated in foreign currencies. Due to the geographic diversity of our operations, weaknesses in some currencies might be offset by strengths in others over time. In addition, we are exposed to adverse changes in interest rates. We manage both these risks through normal operating and financing activities and, when deemed appropriate, through the use of derivative instruments as well as foreign currency debt. We cannot be certain, however, that we will be successful in reducing the risks inherent in exposures to foreign currency and interest rate fluctuations.

Further, we have exposure to foreign currency movements because certain foreign currency transactions need to be converted to a different currency for settlement. These conversions can have a direct impact on our cash flows.

We have entered into a number of derivative contracts with financial counterparties. The effectiveness of these contracts is dependent on the ability of these financial counterparties to perform their obligations and their nonperformance could harm our financial condition.

We have entered into forward foreign currency contracts and cross-currency swaps as part of our financial risk management strategy. The effectiveness of our risk management program using these instruments is dependent, in part, upon the counterparties to these contracts honoring their financial obligations. If any of our counterparties are unable to perform their obligations in the future, we could be exposed to increased earnings and cash flow volatility due to an instrument's failure to hedge or adequately address a financial risk.

Item 1B. *Unresolved Staff Comments*

None.

Item 2. *Properties*

Cabot's corporate headquarters are in leased office space in Boston, Massachusetts. We also own or lease office, manufacturing, storage, distribution, marketing and research and development facilities in the U.S. and in foreign countries. The locations of our principal manufacturing and/or administrative facilities are set forth in the table below. Unless otherwise indicated, all the properties are owned.

Location by Region	Reinforcement Materials	Performance Chemicals	Purification Solutions
Americas Region			
Alpharetta, Georgia*[(1)]	X	X	X
Tuscola, Illinois		X	
Canal, Louisiana	X	X	
Ville Platte, Louisiana	X		
Billerica, Massachusetts	X	X	X
Haverhill, Massachusetts		X	
Midland, Michigan		X	
Pryor, Oklahoma			X
Marshall, Texas			X
Pampa, Texas	X	X	
Campana, Argentina	X		
Maua, Brazil	X	X	
Sao Paulo, Brazil*[(1)]	X	X	X
Saint-Jean-sur-Richelieu, Québec, Canada		X	
Sarnia, Ontario, Canada	X	X	
Cartagena, Colombia	X		
Altamira, Mexico	X		
Europe, Middle East and Africa Region			
Loncin, Belgium		X	
Pepinster, Belgium		X	
Valasske Mezirici (Valmez), Czech Republic**	X		
Port Jerome, France**	X		
Frankfurt, Germany*		X	
Rheinfelden, Germany		X	
Ravenna, Italy (2 plants)	X		X
Riga, Latvia*[(1)]	X	X	X
Schaffhausen, Switzerland*	X	X	X
Botlek, Netherlands**	X	X	
Amersfoort, Netherlands*			X
Klazienaveen, Netherlands			X
Zaandam, Netherlands			X
Dubai, United Arab Emirates*		X	
Purton, United Kingdom (England)			X
Glasgow, United Kingdom (Scotland)			X
Barry, United Kingdom (Wales)**		X	

Location by Region	Reinforcement Materials	Performance Chemicals	Purification Solutions
Asia Pacific Region			
Jiangsu Province, China**		X	
Jiangxi Province, China**		X	
Tianjin, China**	X	X	
Shanghai, China*[(1)]	X	X	X
Shanghai, China** (plant)	X		
Xingtai City, China**	X		
Wuhai, China**		X	
Mumbai, India*	X	X	X
Cilegon, Indonesia**	X		
Jakarta, Indonesia*[(1)]	X	X	X
Chiba, Japan	X		
Shimonoseki, Japan**	X		
Tokyo, Japan*[(1)]	X	X	X
Port Dickson, Malaysia**	X		

(1) Business service center

* Leased premises

** Building(s) owned by Cabot on leased land

We conduct research and development for our various businesses primarily at facilities in Billerica, Massachusetts; Amersfoort, Netherlands; Pampa, Texas; Pepinster, Belgium; Frankfurt, Germany; and Shanghai, China.

With our existing manufacturing plants and planned expansions, we generally have sufficient production capacity to meet current requirements and expected near-term growth. These plants are generally well maintained, in good operating condition and suitable and adequate for their intended use. Our administrative offices and other facilities are suitable and adequate for their intended purposes.

Item 3. *Legal Proceedings*

Cabot is a party in various lawsuits and environmental proceedings wherein substantial amounts are claimed. The following is a description of the significant proceedings pending on September 30, 2019, unless otherwise specified.

Environmental Proceedings

In November 2013, Cabot entered into a Consent Decree with the U.S. Environmental Protection Agency ("EPA") and the Louisiana Department of Environmental Quality ("LDEQ") regarding Cabot's three carbon black manufacturing facilities in the U.S. This settlement is related to the EPA's national enforcement initiative focused on the U.S. carbon black manufacturing sector alleging non-compliance with certain regulatory and permitting requirements under The Clean Air Act, including the New Source Review ("NSR") construction permitting requirements. Pursuant to this settlement, Cabot is in the process of installing technology controls for sulfur dioxide and nitrogen oxide. We expect that the total capital costs to install these controls will be between $175 million and $200 million and will be incurred through calendar year 2022. To date, we have spent approximately $74 million to install these controls. All carbon black manufacturers in the U.S. have settled with the EPA and will be installing similar technology controls.

We continue to perform certain sampling and remediation activities at a former pine tar manufacturing site in Gainesville, Florida that we sold in the 1960s. Those activities are pursuant to a formal Record of Decision and 1991 Consent Decree with the EPA under which we installed a groundwater treatment system at the site in the early 1990s, which remains in operation. More recently, we have been requested by the EPA and other stakeholders to carry out various other additional work at the site. We continue to work cooperatively with the EPA, the Florida Department of Environmental Protection and the local authorities on this matter.

As of September 30, 2019, we had a $13 million reserve for environmental remediation costs at various sites. The operation and maintenance component of this reserve was $4 million. The $13 million reserve represents our current best estimate of costs likely to be incurred for remediation based on our analysis of the extent of cleanup required, alternative cleanup methods available, the ability of other responsible parties to contribute and our interpretation of laws and regulations applicable to each of our sites.

Other Proceedings

Respirator Liabilities

We have exposure in connection with a safety respiratory products business that a subsidiary acquired from American Optical Corporation ("AO") in an April 1990 asset purchase transaction. The subsidiary manufactured respirators under the AO brand and disposed of that business in July 1995. In connection with its acquisition of the business, the subsidiary agreed, in certain circumstances, to assume a portion of AO's liabilities, including costs of legal fees together with amounts paid in settlements and judgments, allocable to AO respiratory products used prior to the 1990 purchase by the Cabot subsidiary. In exchange for the subsidiary's assumption of certain of AO's respirator liabilities, AO agreed to provide to the subsidiary the benefits of: (i) AO's insurance coverage for the period prior to the 1990 acquisition and (ii) a former owner's indemnity of AO holding it harmless from any liability allocable to AO respiratory products used prior to May 1982.

Generally, these respirator liabilities involve claims for personal injury, including asbestosis, silicosis and coal worker's pneumoconiosis, allegedly resulting from the use of respirators that are alleged to have been negligently designed and/or labeled. Neither Cabot, nor its past or present subsidiaries, at any time manufactured asbestos or asbestos-containing products. At no time did this respiratory product line represent a significant portion of the respirator market.

The subsidiary transferred the business to Aearo Corporation ("Aearo") in July 1995. Cabot agreed to have the subsidiary retain certain liabilities associated with exposure to asbestos and silica while using respirators prior to the 1995 transaction so long as Aearo paid, and continues to pay, Cabot an annual fee of $400,000. Aearo can discontinue payment of the fee at any time, in which case it will assume the responsibility for and indemnify Cabot against those liabilities which Cabot's subsidiary had agreed to retain. We anticipate that we will continue to receive payment of the $400,000 fee from Aearo and thereby retain these liabilities for the foreseeable future. We have no liability in connection with any products manufactured by Aearo after 1995.

In addition to Cabot's subsidiary and as described above, other parties are responsible for significant portions of the costs of respirator liabilities, leaving Cabot's subsidiary with a portion of the liability in only some of the pending cases. These parties include Aearo, AO, AO's insurers, another former owner and its insurers, and a third-party manufacturer of respirators formerly sold under the AO brand and its insurers (collectively, with Cabot's subsidiary, the "Payor Group").

As of both September 30, 2019 and 2018, there were approximately 35,000 claimants in pending cases asserting claims against AO in connection with respiratory products. The vast majority of these claims have been pending for more than 10 years with little or no activity and have therefore been excluded from our estimates of our liability for respirator claims. Cabot has contributed to the Payor Group's defense and settlement costs with respect to a percentage of pending claims depending on several factors, including the period of alleged product use. In order to quantify our estimated share of liability for pending and future respirator liability claims, we have engaged, through counsel, the assistance of Nathan Associates, Inc. ("Nathan"), a leading consulting firm in the field of tort liability valuation. The methodology used to estimate the liability addresses the complexities surrounding our potential liability by making assumptions about our likely exposure related to claims pending for less than 10 years and the estimated number of future claimants with respect to periods of asbestos, silica and coal mine dust exposure and respirator use. Using those and other assumptions, we estimate the costs that would be incurred in defending and resolving both currently pending and future claims. During the year ended September 30, 2019, we updated this estimate with the assistance of Nathan. Based on the updated estimate, we increased our reserve as of September 30, 2019 for our estimated share of the liability for pending and future respirator claims by $20 million to $35 million. This increase, as well as the higher payments we made in fiscal 2019, reflect higher costs of defending and resolving these claims. We made payments related to our respirator liability of $10 million in fiscal 2019, and $3 million in each of fiscal 2018 and fiscal 2017.

Our current estimate of the cost of our share of existing and future respirator liability claims is based on facts and circumstances existing at this time. Developments that could affect our estimate include, but are not limited to, (i) significant changes in the number of future claims, (ii) changes in the rate of dismissals without payment of pending claims, (iii) significant changes in the average cost of resolving claims, including potential settlements of groups of claims, (iv) significant changes in the legal costs of defending these claims, (v) changes in the nature of claims received, (vi) trial and appellate outcomes, (vii) changes in the law and procedure applicable to these claims, (viii) the financial viability of members of the Payor Group, (ix) a change in the availability of the insurance coverage of the members of the Payor Group or the indemnity provided by AO's former owner, (x) changes in the allocation of costs among the Payor Group, and (xi) a determination that the assumptions that were used to estimate our share of liability are no longer reasonable. We cannot determine the impact of these potential developments on our current estimate of our share of liability for these existing and future claims. Accordingly, the actual amount of these liabilities for existing and future claims could be different than the reserved amount.

Other Matters

We have various other lawsuits, claims and contingent liabilities arising in the ordinary course of our business and with respect to our divested businesses. We do not believe that any of these matters will have a material adverse effect on our financial position; however, litigation is inherently unpredictable. We could incur judgments, enter into settlements or revise our expectations regarding the outcome of certain matters, and such developments could have a material impact on our results of operations in the period in which the amounts are accrued or our cash flows in the period in which the amounts are paid.

Item 4. ***Mine Safety Disclosures***

Not applicable.

Information about our Executive Officers

Set forth below is certain information about Cabot's executive officers as of November 18, 2019.

Sean D. Keohane, age 52, is President and Chief Executive Officer and a member of Cabot's Board of Directors, positions he has held since March 2016. Mr. Keohane joined Cabot in 2002. From November 2014 until March 2016 he was Executive Vice President and President of Reinforcement Materials. From March 2012 until November 2014, he was Senior Vice President and President of Performance Chemicals, and from May 2008 until March 2012, he was General Manager of Performance Chemicals. He was appointed Vice President in March 2005, Senior Vice President in March 2012 and Executive Vice President in November 2014. He was a member of the Interim Office of the Chief Executive Officer, which was in place from December 2015 until March 2016.

Erica McLaughlin, age 43, is Senior Vice President and Chief Financial Officer. Ms. McLaughlin joined Cabot in 2002. She was appointed Senior Vice President and Chief Financial Officer in May 2018, and in October 2018 she assumed responsibility for Corporate Strategy and Development. From June 2016 until May 2018 she was Vice President of Business Operations for Reinforcement Materials and General Manager of the tire business, and from July 2011 until June 2016, she was Vice President of Investor Relations and Corporate Communications. Prior to July 2011, she held a variety of leadership positions in Finance and Corporate Planning.

Karen A. Kalita, age 40, is Senior Vice President and General Counsel. Ms. Kalita joined Cabot in 2008. Prior to assuming her current position in June 2019, she held several key positions in Cabot's Law Department, including Chief Counsel to the Company's Reinforcement Materials segment from November 2015 to June 2019 and Purification Solutions segment from June 2013 to June 2019, and senior legal counsel to the Company's previous Advanced Technologies segment. Prior to joining the Company, Ms. Kalita was in private practice at WilmerHale LLP in Boston, MA.

Hobart C. Kalkstein, age 49, is Senior Vice President and President, Reinforcement Materials Segment and President, Americas Region. Mr. Kalkstein joined Cabot in 2005. Prior to assuming his current role in April 2016, he was Vice President of Corporate Strategy and Development from December 2015 to April 2016. From October 2013 to December 2015, he served as Vice President of Global Business Operations for Purification Solutions and from November 2012 to December 2015 as General Manager of Global Emission Control Solutions for Purification Solutions, and from January 2012 to November 2012 he served as Vice President of Business Operations and Executive Director of Marketing and Business Strategy for Performance Chemicals. Prior to that, he served as General Manager of the Aerogel business from October 2007 to February 2010.

Jeff Zhu, age 51, is Senior Vice President and President, Performance Additives business and President, Asia Pacific Region. Mr. Zhu joined Cabot in 2012. Prior to assuming his current role in October 2019, he had served as President, Asia Pacific Region since joining Cabot. Prior to joining Cabot, Mr. Zhu served in a variety of regional and global business leadership roles at Rhodia from 1994 until 2010, including Asia Pacific regional commercial director from 1994 to 2002, regional vice president and general manager of Rhodia Novacare Asia Pacific from 2002 to 2008, and vice president and global director of Rhodia electronics and catalysis from 2008 to 2010. In addition, Mr. Zhu served as head of global pulp and paper sales at Asia Pacific Resources International Holdings Limited from 2010 to 2012.

PART II

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

Cabot's common stock is listed for trading (symbol CBT) on the New York Stock Exchange. As of November 18, 2019, there were 644 holders of record of Cabot's common stock.

Issuer Purchases of Equity Securities

The table below sets forth information regarding Cabot's purchases of its equity securities during the quarter ended September 30, 2019:

Period	Total Number of Shares Purchased[(1)(2)]	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs[(1)]	Maximum Number (or Approximate Dollar Value) of Shares that May Yet Be Purchased Under the Plans or Programs[(1)]
July 1, 2019 — July 31, 2019	—	$ —	—	6,605,045
August 1, 2019 — August 31, 2019	525,000	$ 38.66	525,000	6,080,045
September 1, 2019 — September 30, 2019	193,358	$ 42.00	193,358	5,886,687
Total	718,358		718,358	

(1) On July 13, 2018, Cabot publicly announced that the Board of Directors authorized the Company to repurchase up to ten million shares of its common stock on the open market or in privately negotiated transactions, increasing the current balance of shares available for repurchase at that time to approximately eleven million shares. The current authorization does not have a set expiration date.

(2) Total number of shares purchased does not include 2,074 shares withheld to pay taxes on the vesting of equity awards made under the Company's equity incentive plans or to pay the exercise price of options exercised during the period.

Item 6. ***Selected Financial Data***

	Years Ended September 30				
	2019	2018	2017	2016	2015
	(In millions, except per share amounts and ratios)				
Consolidated Net Income (Loss)					
Net sales and other operating revenues	$ 3,337	$ 3,242	$ 2,717	$ 2,411	$ 2,871
Gross profit[1][2]	685	772	657	575	585
Selling and administrative expenses[2]	290	308	262	275	282
Research and technical expenses[2]	60	66	57	53	58
Specialty Fluids loss on sale and asset impairment	29	—	—	—	—
Purification Solutions long-lived assets impairment charge	—	162	—	—	210
Purification Solutions goodwill impairment charge	—	92	—	—	352
Income (loss) from operations	306	144	338	247	(317)
Net interest expense and other charges[2][3]	(51)	(27)	(39)	(56)	(60)
Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies[1][4]	255	117	299	191	(377)
(Provision) benefit for income taxes[1][5]	(70)	(193)	(33)	(33)	45
Equity in earnings of affiliated companies	1	2	7	3	4
Income (loss) from discontinued operations, net of tax	—	—	—	1	2
Net income (loss)[1]	186	(74)	273	162	(326)
Net income attributable to noncontrolling interests, net of tax	29	39	25	15	8
Net income (loss) attributable to Cabot Corporation[1]	$ 157	$ (113)	$ 248	$ 147	$ (334)
Common Share Data					
Diluted net income (loss) attributable to Cabot Corporation:					
Income (loss) from continuing operations[1]	$ 2.63	$ (1.85)	$ 3.91	$ 2.30	$ (5.29)
Income (loss) from discontinued operations	—	—	—	0.02	0.02
Net income (loss) attributable to Cabot Corporation	$ 2.63	$ (1.85)	$ 3.91	$ 2.32	$ (5.27)
Dividends	$ 1.36	$ 1.29	$ 1.23	$ 1.04	$ 0.88
Closing prices	$ 45.32	$ 62.72	$ 55.80	$ 52.41	$ 31.56
Weighted-average diluted shares outstanding—millions	58.8	61.7	62.7	62.9	63.4
Shares outstanding at year end—millions	57.1	60.4	61.9	62.2	62.5
Consolidated Financial Position					
Current assets[1]	$ 1,210	$ 1,386	$ 1,299	$ 1,073	$ 1,004
Net property, plant, and equipment	1,348	1,296	1,305	1,290	1,383
Other assets[1]	446	562	734	689	676
Total assets	$ 3,004	$ 3,244	$ 3,338	$ 3,052	$ 3,063
Current liabilities	$ 599	$ 952	$ 742	$ 397	$ 440
Long-term debt	1,024	719	661	914	967
Other long-term liabilities	247	294	310	352	318
Cabot Corporation stockholders' equity[1]	998	1,154	1,504	1,291	1,234
Noncontrolling interests	136	125	121	98	104
Total liabilities and stockholders' equity	$ 3,004	$ 3,244	$ 3,338	$ 3,052	$ 3,063
Selected Financial Ratios					
Net debt to capitalization ratio[1][6]	44%	39%	28%	34%	41%
Adjusted return on net assets[7]	13%	14%	13%	11%	9%

(1) In fiscal 2018, the Company elected to change its inventory valuation method of accounting for its U.S. carbon black inventories from the last-in, first-out ("LIFO") method to the first-in, first-out ("FIFO") method. The Company applied this change retrospectively and fiscal 2017 and 2016 balances have been updated accordingly. Fiscal 2015 has not been updated to reflect this change and may not be comparable to the other years presented.

(2) In fiscal 2019, the Company adopted a new accounting standard that amends the requirements on the presentation of net periodic pension and postretirement benefit costs. The Company applied this change retrospectively and fiscal 2018 and 2017 balances have been updated as discussed in Note B of our Notes to the Consolidated Financial Statements. Fiscal 2016 and 2015 have not been updated to reflect this change and may not be comparable to the other years presented.

(3) Net interest expense and other charges includes foreign currency activity as follows: a gain of less than $1 million for fiscal 2019, a loss of $4 million for both fiscal 2018 and fiscal 2017, a gain of $5 million for fiscal 2016, and a loss of $8 million for fiscal 2015.

(4) Income (loss) from continuing operations includes certain items as presented in the table below. A discussion of certain items is included in Definition of Terms and Non-GAAP Financial Measures in Results of Operations.

	Years Ended September 30				
	2019	2018	2017	2016	2015
			(In millions)		
Specialty Fluids loss on sale and asset impairment charge (Note D)	$ (29)	$ —	$ —	$ —	$ —
Legal and environmental matters and reserves	(21)	(16)	1	(17)	—
Global restructuring activities (Note P)	(16)	30	(3)	(47)	(21)
Equity affiliate investment impairment charge (Note M)	(11)	—	—	—	—
Acquisition and integration-related charges	(6)	(2)	—	—	(5)
Executive transition costs	(1)	(2)	—	(6)	—
Purification Solutions goodwill and long-lived assets impairment charge (Note G)	—	(254)	—	—	(562)
Inventory reserve adjustment	—	(13)	—	—	(6)
Gains (losses) on sale of investments	—	10	—	—	—
Non-recurring gain (loss) on foreign exchange	—	—	—	(11)	(2)
Employee benefit plan settlement and other charges	—	—	—	—	(21)
Other certain items	(3)	(1)	(1)	—	—
Total certain items, pre-tax	(87)	(248)	(3)	(81)	(617)
Tax-related certain items:					
Tax impact of certain items[a]	7	31	1	31	94
Discrete tax items	5	(148)	25	—	13
Total tax-related certain items	12	(117)	26	31	107
Total certain items, net of tax	$ (75)	$ (365)	$ 23	$ (50)	$ (510)

(a) The tax impact of certain items is determined by (1) starting with the current and deferred income tax expense or benefit, included in Net income attributable to Cabot Corporation, net of discrete tax items, and (2) subtracting the tax expense or benefit on “adjusted earnings”. Adjusted earnings is defined as the pre-tax income attributable to Cabot Corporation excluding certain items. The tax expense or benefit on adjusted earnings is calculated by applying the operating tax rate, as defined under the section Definition of Terms and Non-GAAP Financial Measures in Results of Operations, to adjusted earnings.

(5) The Company’s effective tax rate for fiscal 2019 was 28% which included a net discrete tax benefit of $7 million, composed of tax benefits of $4 million related to uncertain tax positions, $2 million related to a pension settlement, $2 million related to changes in valuation allowance on beginning of year tax balances, $2 million related to the Specialty Fluids sale, $1 million related to result of changes in non-US tax laws and $1 million related to other miscellaneous tax items, partially offset by net tax charges of $5 million related to various return to provision adjustments related to tax return filings and audit settlements. The Company’s effective tax rate for fiscal 2018 was a provision of 165% which included net discrete tax expense of $120 million, composed of $159 million net tax impact of the Tax Cuts and Jobs Act of 2017 (the “Act”), and $3 million tax expense upon the sale of assets, offset by net tax benefits of $29 million related to impairment and $15 million from a change in valuation allowance on a beginning of year tax balance, and net tax charge of $2 million related to other miscellaneous tax items. The Company’s effective tax rate for fiscal 2017 was a provision of 10% which included net discrete tax benefits of $25 million, composed of net tax benefits of $16 million associated with the generation of excess foreign tax credits upon repatriation of previously taxed foreign earnings and the accrual of U.S. tax on certain foreign earnings, a net tax benefit of $6 million from a change in valuation allowance on a beginning of year tax balance, net tax benefits of $4 million for various return to provision adjustments related to tax return filings and net tax charges of $1 million related to other miscellaneous tax items. The Company’s effective tax rate for fiscal 2016 was a provision of 18%, which included less than $1 million of discrete tax charges, composed of charges of $5 million for valuation allowances on beginning of the year tax balances, partially offset by benefits of $3 million for a currency loss and $1 million each for the renewal of the U.S. research and experimentation credit and net tax settlements. The Company’s effective tax rate for fiscal 2015 was a benefit of 12%, which included $13 million of discrete tax benefits composed of $7 million for tax settlements, $4 million for repatriation, and $2 million for the renewal of the U.S. research and experimentation credit.

(6) Net debt to capitalization ratio is calculated by dividing total debt (the sum of short-term and long-term debt less cash and cash equivalents) by total capitalization (the sum of Total stockholders’ equity plus total debt).

(7) Adjusted return on net assets ("adjusted RONA") measures how effectively and efficiently the Company uses its operating assets to generate earnings. Return on net assets ("RONA") and adjusted RONA are not measures of financial performance under accounting principles generally accepted ("GAAP") in the United States and should not be considered substitutes for measures of performance reported under GAAP. We believe adjusted RONA provides useful supplemental information to our investors because it allows investors to understand the basis on which management evaluates the Company's operational effectiveness and because it is a performance metric used in our equity incentive compensation program. We calculate adjusted RONA by dividing the most recent twelve months' adjusted net income (loss) (a non-GAAP numerator) by adjusted net assets (a non-GAAP denominator). In the numerator, we exclude "certain items" net of tax from income (loss) from continuing operations as calculated under GAAP. The items of expense and income we consider "certain items" are described in the discussion of Definition of Terms and Non-GAAP Financial Measures in Results of Operations. The denominator consists of our operating assets, which are: net property, plant and equipment; adjusted net working capital; assets held for rent; and investments in equity affiliates. We calculate the items in adjusted net assets using the most recent five quarters' average to normalize the impact of large inter-period movements (e.g. working capital movements caused by feedstock price volatility). Our calculation of adjusted RONA is as follows:

	Years Ended September 30				
	2019	2018	2017	2016	2015
	(In millions, except ratios)				
Return on Net Assets					
Income (loss) from continuing operations[a] [b]	$ 186	$ (74)	$ 273	$ 161	$ (328)
Net assets[b] [c]	$ 1,134	$ 1,279	$ 1,625	$ 1,389	$ 1,338
Return on net assets	16%	(6)%	17%	12%	(25)%
Adjusted Return on Net Assets					
Adjusted net income (loss)[a]:					
Income (loss) from continuing operations[b]	$ 186	$ (74)	$ 273	$ 161	$ (328)
Less: Total certain items, net of tax[d]	(75)	(365)	23	(50)	(510)
Adjusted net income (loss)	$ 261	$ 291	$ 250	$ 211	$ 182
Adjusted net assets[e]:					
Adjusted net working capital[b] [f]	$ 570	$ 568	$ 474	$ 443	$ 607
Net property, plant and equipment	1,318	1,290	1,267	1,322	1,416
Assets held for rent	75	110	101	92	67
Equity affiliates	45	56	55	55	63
Adjusted net assets	$ 2,008	$ 2,024	$ 1,897	$ 1,912	$ 2,153
Adjusted return on net assets	13%	14%	13%	11%	9%

(a) Income (loss) from continuing operations and Adjusted net income (loss) are aggregated four quarter rolling amounts.

(b) In fiscal 2018, the Company elected to change its inventory valuation method of accounting for its U.S. carbon black inventories from the LIFO method to the FIFO method. The Company applied this change retrospectively and fiscal 2017 and 2016 balances have been updated accordingly. Fiscal 2015 has not been updated to reflect this change and may not be comparable to the other years presented.

(c) Net assets represents Total stockholders' equity.

(d) Total certain items, net of tax is detailed in the table in note (4) above.

(e) Each component of adjusted net assets is calculated by averaging previous five quarter ending balances.

(f) Adjusted net working capital is the average of the previous five quarter ending balances of Accounts receivable plus Inventory less Accounts payable and accruals.

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

Critical Accounting Policies

Our consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States ("GAAP"). This preparation of our financial statements requires management to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues, and expenses and related disclosure of contingent assets and liabilities. We consider an accounting estimate to be critical to the financial statements if (i) the estimate is complex in nature or requires a high degree of judgment and (ii) different estimates and assumptions were used, the results could have a material impact on the consolidated financial statements. On an ongoing basis, we evaluate our estimates and the application of our policies. We base our estimates on historical experience, current conditions and on various other assumptions that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates. The policies that we believe are critical to the preparation of the consolidated financial statements are presented below.

Revenue Recognition

We recognize revenue when our customers obtain control of promised goods or services. The revenue recognized is the amount of consideration which we expect to receive in exchange for those goods or services. Our contracts with customers are generally for products only and do not include other performance obligations. Generally, we consider purchase orders, which in some cases are governed by master supply agreements, to be contracts with customers. The transaction price as specified on the purchase order or sales contract is considered the standalone selling price for each distinct product. To determine the transaction price at the time when revenue is recognized, we evaluate whether the price is subject to adjustments, such as for returns, discounts or volume rebates, which are stated in the customer contract, to determine the net consideration to which we expect to be entitled. Revenue from product sales is recognized based on a point in time model when control of the product is transferred to the customer, which typically occurs upon shipment or delivery of the product to the customer and title, risk and rewards of ownership have passed to the customer. We have an immaterial amount of revenue that is recognized over time. Payment terms typically range from zero to ninety days.

Shipping and handling activities that occur after the transfer of control to the customer are billed to customers and are recorded as sales revenue, as we consider these to be fulfillment costs. Shipping and handling costs are expensed in the period incurred and included in Cost of sales within the Consolidated Statement of Operations. Taxes collected on sales to customers are excluded from the transaction price.

We generally provide a warranty that our products will substantially conform to the identified specifications. Our liability typically is limited to either a credit equal to the purchase price or replacement of the non-conforming product. Returns under warranty have historically been immaterial.

Revenue in the Specialty Fluids segment arose primarily from the rental of cesium formate. This revenue was recognized throughout the rental period based on the contracted rental terms. Customers were also billed and revenue was recognized, typically at the end of the rental period, for cesium formate product that was not returned. We also generated revenues from cesium formate sold outside of the rental process and from the sale of fine cesium chemicals. This revenue was recognized when control of the product transferred to the customer, which was typically upon delivery of the product.

We do not have contract assets or liabilities that are material.

As permitted by the revenue recognition standard, *Revenue from Contracts with Customers*, issued by the Financial Accounting Standards Board ("FASB"), when the period of time between the transfer of control of the goods and the time the customer pays for the goods is one year or less, we do not consider there to be a significant financing component associated with the contract.

Inventory Valuation

Inventories are stated at the lower of cost or net realizable value. The cost of Specialty Fluids inventories that were classified as assets held for rent was determined using the average cost method. The cost of all other inventories is determined using the FIFO method.

We periodically review inventory for both potential obsolescence and potential declines in anticipated selling prices. In this review, we make assumptions about the future demand for and market value of the inventory, and based on these assumptions estimate the amount of any obsolete, unmarketable, slow moving or overvalued inventory. We write down the value of our inventories by an amount equal to the difference between the cost of the inventory and its estimated net realizable value. Historically, such write-downs have not been material. If actual market conditions are less favorable than those projected by management at the time of the assessment, however, additional inventory write-downs may be required, which could reduce our gross profit and our earnings.

Intangible Assets and Goodwill Impairment

We record tangible and intangible assets acquired and liabilities assumed in business combinations under the acquisition method of accounting. Amounts paid for an acquisition are allocated to the assets acquired and liabilities assumed based on their fair values at the date of acquisition. We use 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 requires the use of significant judgment with regard to assumptions used in the valuation model. We estimate the fair value of identifiable acquisition-related intangible assets principally based on projections of cash flows that will arise from these assets. The projected cash flows are discounted to determine the fair value of the assets at the dates of acquisition.

Definite-lived intangible assets, which are comprised of trademarks, customer relationships and developed technologies, are amortized over their estimated useful lives and are reviewed for impairment when indication of potential impairment exists, such as a significant reduction in cash flows associated with the assets.

Goodwill is comprised of the purchase price of business acquisitions in excess of the fair value assigned to the net tangible and identifiable intangible assets acquired. Goodwill is not amortized and is subject to impairment testing annually, or when events or changes in the business environment indicate that the carrying value of the reporting unit may exceed its fair value.

Historically, the annual goodwill impairment test was performed as of May 31. During the fourth quarter of fiscal 2019, we changed the date of our impairment test to August 31. This date is preferred as it better aligns with our planning process, which produces a significant input to the testing, and it did not result in a material change to our consolidated financial statements.

A reporting unit, for the purpose of the impairment test, is at or below the operating segment level, and constitutes a business for which discrete financial information is available and regularly reviewed by segment management. Reinforcement Materials, and the fumed metal oxides and specialty compounds product lines within Performance Chemicals, which are considered separate reporting units, carried our goodwill balances as of September 30, 2019.

For the purpose of the goodwill impairment test, we first assess qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount. If an initial qualitative assessment identifies that it is more likely than not that the carrying value of a reporting unit exceeds its estimated fair value, an additional quantitative evaluation is performed. Alternatively, we may elect to proceed directly to the quantitative goodwill impairment test. If based on the quantitative evaluation the fair value of the reporting unit is less than its carrying amount, a goodwill impairment loss would result. The goodwill impairment loss would be the amount by which the carrying value of the reporting unit, including goodwill, exceeds its fair value, limited to the total amount of goodwill allocated to that reporting unit. The fair value of a reporting unit is based on discounted estimated future cash flows. The fair value is also benchmarked against the value calculated from a market approach using the guideline public companies method. The assumptions used to estimate fair value include management’s best estimates of future growth rates, operating cash flows, capital expenditures and discount rates over an estimate of the remaining operating period at the reporting unit level. Based on our most recent annual goodwill impairment test performed as of August 31, 2019, the fair values of the Reinforcement Materials, Fumed Metal Oxides and Specialty Compounds reporting units were substantially in excess of their carrying values. Refer to Note G of our Notes to the Consolidated Financial Statements (“Note G”) for details on the Purification Solutions goodwill impairment test and the resulting impairment charge recorded in the second quarter of fiscal 2018.

Long-lived Assets Impairment

Our long-lived assets primarily include property, plant and equipment, intangible assets, long-term investments and assets held for rent. The carrying values of long-lived assets are reviewed for impairment whenever events or changes in business circumstances indicate that the carrying amount of an asset may not be recoverable.

To test for impairment of assets, we generally use a probability-weighted estimate of the future undiscounted net cash flows of the assets over their remaining lives to determine if the value of the asset is recoverable. Long-lived assets are grouped with other assets and liabilities at the lowest level for which independent identifiable cash flows are determinable.

An asset impairment is recognized when the carrying value of the asset is not recoverable based on the analysis described above, in which case the asset is written down to its fair value. If the asset does not have a readily determinable fair value, a discounted cash flow model may be used to determine the fair value of the asset. In circumstances when an asset does not have separately identifiable cash flows, an impairment charge is recorded when we no longer intend to use the asset. Refer to Note G regarding the results of the recoverability test performed on the long-lived assets of the Purification Solutions segment and the resulting impairment charge recorded in the second quarter of fiscal 2018.

We continue to consider strategic options for our Purification Solutions business. Depending on the actions taken, there could be a negative impact on the fair value of the Purification Solutions reporting unit, which may lead to further impairment.

Purification Solutions Goodwill and Long-Lived Assets Impairment Charges

During the second quarter of fiscal 2018 as a result of the impairment tests performed on goodwill and long-lived assets of the Purification Solutions reporting unit, we recorded impairment charges and an associated tax benefit in the Consolidated Statements of Operations as follows:

	Three Months Ended March 31, 2018
	(In millions)
Goodwill impairment charge	$ 92
Long-lived assets impairment charge	162
Benefit for income taxes	(30)
Impairment charges, net of tax	$ 224

In the second quarter of fiscal 2018, the Purification Solutions reporting unit had experienced market share losses, lower customer demand and declining prices in the mercury removal and North America powdered activated carbon applications, which led us to reassess our previous estimates for expected growth in volumes, prices and margins in the reporting unit. Due to revised forecasts at the time, we performed the quantitative goodwill impairment test and determined that the estimated fair value of the Purification Solutions reporting unit was lower than the reporting unit's carrying value, resulting in a goodwill impairment charge of $92 million.

Prior to determining the goodwill impairment charge, we considered whether the assets of the reporting unit, which is also considered the asset group, were recoverable. As a result of this assessment, we recorded an inventory reserve adjustment of $13 million and impairments to long lived assets of $162 million. The adjustment to inventory carrying value was determined based on reassessments of volumes, pricing, and margins for the reporting unit at the time and was recorded in Cost of sales in the Consolidated Statements of Operations. The impairment analysis to assess if definite-lived intangible assets and property, plant and equipment were recoverable was based on the estimated undiscounted cash flows of the reporting unit, and these cash flows were not sufficient to recover the carrying value of the long-lived assets over their remaining useful lives. Accordingly, we recorded impairment charges of $64 million and $98 million, to our definite-lived intangible assets and property, plant and equipment, respectively, in the second quarter of fiscal 2018 based on the lower of the carrying amount or fair value of the long-lived assets.

We will continue to monitor for events or changes in business circumstances that may indicate that the remaining carrying value of the asset group may not be recoverable.

We recorded a tax benefit related to the impairment charges of $30 million in the second quarter of fiscal 2018 which was subsequently reduced by $1 million after the impairment charges by tax jurisdiction were finalized in the fourth quarter of fiscal 2018.

Pensions and Other Postretirement Benefits

We maintain both defined benefit and defined contribution plans for our employees. In addition, we provide certain postretirement health care and life insurance benefits for our retired employees. Plan obligations and annual expense calculations are based on a number of key assumptions. The assumptions, which are specific for each of our U.S. and foreign plans, are related to both the assets we hold to fund our plans (where applicable) and the characteristics of the benefits that will ultimately be provided to our employees. The most significant assumptions relative to our plan assets include the anticipated rates of return on these assets. Assumptions relative to our pension obligations are more varied; they include estimated discount rates, rates of compensation increases for employees, and mortality, employee turnover and other related demographic data. Projected health care and life insurance obligations also rely on the above mentioned demographic assumptions and assumptions surrounding health care cost trends. Actual results that differ from the assumptions are generally accumulated and amortized over future periods and could therefore affect the recognized expense and recorded obligation in such future periods. However, cash flow requirements may be different from the amounts of expense that are recorded in the consolidated financial statements.

Litigation and Contingencies

We are involved in litigation in the ordinary course of business, including personal injury and environmental litigation. After consultation with counsel, as appropriate, we accrue a liability for litigation when it is probable that a liability has been incurred and the amount can be reasonably estimated. The estimated reserves are recorded based on our best estimate of the liability associated with such matters or the low end of the estimated range of liability if we are unable to identify a better estimate within that range. Our best estimate is determined through the evaluation of various information, including claims, settlement offers, demands by government agencies, estimates performed by independent third parties, identification of other responsible parties and an assessment of their ability to contribute, and our prior experience. Litigation is highly uncertain and there is always the possibility of an unusual result in any particular case that may reduce our earnings and cash flows.

The most significant reserves that we have established are for environmental remediation and respirator litigation claims. The amount accrued for environmental matters reflects our assumptions about remediation requirements at the contaminated sites, the nature of the remedies, the outcome of discussions with regulatory agencies and other potentially responsible parties at multi-party sites, and the number and financial viability of other potentially responsible parties. These liabilities can be affected by the availability of new information, changes in the assumptions on which the accruals are based, unanticipated government enforcement action or changes in applicable government laws and regulations, which could result in higher or lower costs.

Our current estimate of the cost of our share of existing and future respirator liability claims is based on facts and circumstances existing at this time. Developments that could affect our estimate include, but are not limited to, (i) significant changes in the number of future claims, (ii) changes in the rate of dismissals without payment of pending claims, (iii) significant changes in the average cost of resolving claims, including potential settlements of groups of claims, (iv) significant changes in the legal costs of defending these claims, (v) changes in the nature of claims received, (vi) trial and appellate outcomes, (vii) changes in the law and procedure applicable to these claims, (viii) the financial viability of the parties that contribute to the settlement of respirator claims, (ix) a change in the availability of insurance coverage maintained by certain of the parties that contribute to the settlement of respirator claims, or the indemnity provided by a former owner of the business, (x) changes in the allocation of costs among the various parties paying legal and settlement costs, and (xi) a determination that the assumptions that were used to estimate our share of liability are no longer reasonable. We cannot determine the impact of these potential developments on our current estimate of our share of liability for these existing and future claims. Accordingly, the actual amount of these liabilities for existing and future claims could be different than the reserved amount.

Income Taxes

Our business operations are global in nature, and we are subject to taxes in numerous jurisdictions. Tax laws and tax rates vary substantially in these jurisdictions and are subject to change based on the political and economic climate in those countries. We file our tax returns in accordance with our interpretations of each jurisdiction’s tax laws.

Significant judgment is required in determining our worldwide provision for income taxes and recording the related tax assets and liabilities. In the ordinary course of our business, there are operational decisions, transactions, facts and circumstances, and calculations which make the ultimate tax determination uncertain. Furthermore, our tax positions are periodically subject to challenge by taxing authorities throughout the world. We have recorded reserves for taxes and associated interest and penalties that may become payable in future years as a result of audits by tax authorities. Any significant impact as a result of changes in underlying facts, law, tax rates, tax audit, or review could lead to adjustments to our income tax expense, our effective tax rate, and/or our cash flow.

We record benefits for uncertain tax positions based on an assessment of whether the position is more likely than not to be sustained by the taxing authorities. If this threshold is not met, no tax benefit of the uncertain tax position is recognized. If the threshold is met, the tax benefit that is recognized is the largest amount that is greater than 50% likely of being realized upon ultimate settlement. This analysis presumes the taxing authorities’ full knowledge of the positions taken and all relevant facts, but does not consider the time value of money. We also accrue for interest and penalties on these uncertain tax positions and include such charges in the income tax provision in the Consolidated Statements of Operations.

Additionally, we have established valuation allowances against a variety of deferred tax assets, including net operating loss carryforwards, foreign tax credits, and other income tax credits. Valuation allowances take into consideration our ability to use these deferred tax assets and reduce the value of such items to the amount that is deemed more likely than not to be recoverable. Our ability to utilize these deferred tax assets is dependent on achieving our forecast of future taxable operating income over an extended period of time. We review our forecast in relation to actual results and expected trends on a quarterly basis. Failure to achieve our operating income targets may change our assessment regarding the recoverability of our net deferred tax assets and such change could result in a valuation allowance being recorded against some or all of our net deferred tax assets. An increase in a valuation allowance would result in additional income tax expense, while a release of valuation allowances in periods when these tax attributes become realizable would reduce our income tax expense.

Significant Accounting Policies

We have other significant accounting policies that are discussed in Note A in Item 8 below. Certain of these policies include the use of estimates, but do not meet the definition of critical because they generally do not require estimates or judgments that are as difficult or subjective to measure. However, these policies are important to an understanding of the consolidated financial statements.

Recently Issued Accounting Pronouncements

Refer to the discussion in Note B of our Notes to the Consolidated Financial Statements.

Results of Operations

Cabot was organized into four reportable business segments through June 28, 2019: Reinforcement Materials, Performance Chemicals, Purification Solutions and Specialty Fluids. The Specialty Fluids business was divested as of June 28, 2019 and since that time Cabot has been organized into the three remaining reportable business segments. Cabot is also organized for operational purposes into three geographic regions: the Americas; Europe, Middle East and Africa; and Asia Pacific. The discussions of our results of operations for the periods presented reflect these structures.

Our analysis of financial condition and operating results should be read with our consolidated financial statements and accompanying notes. Unless a calendar year is specified, all references to years in this discussion are to our fiscal years ended September 30.

This section discusses our fiscal 2019 and fiscal 2018 results of operations and year-to-year comparisons between fiscal 2019 and fiscal 2018. For the discussions of our fiscal 2017 results and year-to-year comparisons between fiscal 2018 and fiscal 2017, refer to our discussions under the headings “Results of Operations” and “Cash Flows and Liquidity” in Item 7 of the Company’s Annual Report on Form 10-K for the fiscal year ended September 30, 2018, which was filed with the United States Securities and Exchange Commission on November 21, 2018.

Definition of Terms and Non-GAAP Financial Measures

When discussing our results of operations, we use several terms as described below.

The term “product mix” refers to the mix of types and grades of products sold or the mix of geographic regions where products are sold, and the positive or negative impact this has on the revenue or profitability of the business and/or segment.

Our discussion under the heading “Provision (Benefit) for Income Taxes and Reconciliation of Effective Tax Rate to Operating Tax Rate” includes a discussion of our “effective tax rate” and our “operating tax rate” and includes a reconciliation of the two rates. Our operating tax rate is a non-GAAP financial measure and should not be considered as an alternative to our effective tax rate, the most comparable GAAP financial measure. In calculating our operating tax rate, we exclude discrete tax items, which include: (i) unusual or infrequent items such as a significant release or establishment of a valuation allowance, (ii) items related to uncertain tax positions such as the tax impact of audit settlements, interest on tax reserves, and the release of tax reserves from the expiration of statutes of limitations, and (iii) other discrete tax items, such as the tax impact of legislative changes and, on a quarterly basis, the timing of losses in certain jurisdictions and the cumulative rate adjustment, if applicable. We also exclude the tax impact of certain items, as defined below in the discussion of Total segment EBIT, on both operating income and the tax provision. When the tax impact of a certain item is also a discrete tax item, it is classified as a certain item for our definition of operating tax rate. Our definition of the operating tax rate may not be comparable to the definition used by other companies. Management believes that the non-GAAP financial measure is useful supplemental information because it helps our investors compare our tax rate year to year on a consistent basis and understand what our tax rate on current operations would be without the impact of these items.

Our discussion under the heading "Fiscal 2019 compared to Fiscal 2018—By Business Segment" includes a discussion of Total segment EBIT, which is a non-GAAP financial measure defined as Income (loss) from continuing operations before income taxes and equity in earnings from affiliated companies less certain items and other unallocated items. Our Chief Operating Decision Maker, who is our President and Chief Executive Officer, uses segment EBIT to evaluate the operating results of each segment and to allocate resources to the segments. We believe Total segment EBIT, which reflects the sum of EBIT from our reportable segments, provides useful supplemental information for our investors as it is an important indicator of our operational strength and performance, allows investors to see our results through the eyes of management, and provides context for our discussion of individual business segment performance. Total segment EBIT should not be considered an alternative for Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies, which is the most directly comparable GAAP financial measure. A reconciliation of Total segment EBIT to Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies is provided under the heading "Fiscal 2019 compared to Fiscal 2018—By Business Segment". Investors should consider the limitations associated with this non-GAAP measure, including the potential lack of comparability of this measure from one company to another.

In calculating Total segment EBIT, we exclude from our Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies (i) items of expense and income that management does not consider representative of our fundamental on-going segment results, which we refer to as "certain items", and (ii) items that, because they are not controlled by the business segments and primarily benefit corporate objectives, are not allocated to our business segments, such as interest expense and other corporate costs, which include unallocated corporate overhead expenses such as certain corporate salaries and headquarter expenses, plus costs related to special projects and initiatives, which we refer to as "other unallocated items". Management believes excluding the items identified as certain items facilitates operating performance comparisons from period to period by eliminating differences caused by the existence and timing of certain expense and income items that would not otherwise be apparent on a GAAP basis and also facilitates an evaluation of our operating performance without the impact of these costs or benefits. The items of income and expense that we have excluded from Total segment EBIT, as applicable, but that are included in our GAAP Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies, as applicable, are described below.

- Asset impairment charges, which primarily include charges associated with an impairment of goodwill or other long-lived assets.
- Global restructuring activities include costs or benefits associated with cost reduction initiatives or plant closures, which primarily relate to (i) employee termination costs, (ii) asset impairment charges associated with restructuring actions, (iii) costs to close facilities, including environmental costs and contract termination penalties and (iv) gains realized on the sale of land or equipment associated with restructured plants or locations.
- Inventory reserve adjustment, which resulted from an evaluation performed as part of an impairment analysis.
- Acquisition and integration-related charges, which include transaction costs, redundant costs incurred during the period of integration, and costs associated with transitioning certain management and business processes to our processes.
- Legal and environmental reserves and matters, which consist of costs or benefits for matters typically related to former businesses or that are otherwise incurred outside of the ordinary course of business.
- Gains (losses) on sale of investments, which primarily relate to the sale of investments accounted for using the cost method.
- Gains (losses) on sale of businesses.
- Non-recurring gains (losses) on foreign exchange, which primarily relate to the impact of controlled currency devaluations on our net monetary assets denominated in that currency.
- Executive transition costs, which include incremental charges, including stock compensation charges, associated with the retirement or termination of employment of senior executives of the Company.
- Employee benefit plan settlement charges, which consist of the costs associated with transferring the obligations and assets held by one of our defined benefit plans to a multi-employer plan.

Drivers of Demand and Key Factors Affecting Profitability

Drivers of demand and key factors affecting our profitability differ by segment. In Reinforcement Materials, longer term demand is driven primarily by: i) the number of vehicle miles driven globally; ii) the number of original equipment and replacement tires produced; and iii) the number of automotive builds. Over the past several years, operating results have been driven by a number of factors, including: i) increases or decreases in our sales volumes driven by changes in production levels for tires or industrial rubber products and the level at which we service that demand; ii) changes in raw material costs and our ability to adjust the sales price for our products commensurate with changes in raw material costs; iii) changes in pricing and product mix, which includes customer pricing as well as the mix of products sold or the region in which they are sold; iv) global and regional capacity utilization for carbon black; v) fixed cost savings achieved through restructuring and other cost saving activities; vi) the growth of our volumes and market position in emerging economies; vii) capacity management and technology investments, including the impact of energy utilization and yield improvement technologies at our manufacturing facilities; and viii) royalties and technology payments related to our patented elastomer composites technology that is used in tire applications.

In Performance Chemicals, longer term demand is driven primarily by the construction and infrastructure, automotive, electronics and consumer products industries. In recent years, operating results in Performance Chemicals have been driven by: i) increases or decreases in sales volumes to the industries previously noted; ii) changes in pricing and product mix, which includes customer pricing as well as the mix of products sold or the region in which they are sold; iii) our ability to deliver differentiated products that drive enhanced performance in customers' applications; iv) our ability to obtain value pricing for this differentiation; v) the cost of new capacity; vi) changes in selling prices relative to variations in the cost of raw materials; and vii) the adoption of new products for use in our customers' applications.

In Purification Solutions, longer term demand is driven primarily by the demand for activated carbon based solutions for water, gas and air, pharmaceuticals, food and beverages, catalysts and other chemical applications. Operating results in Purification Solutions have been influenced by: i) changes in our sales volumes in the various applications previously noted; ii) management of our operations, including inventory levels, and the commensurate costs; iii) changes in price and product mix; iv) industry capacity utilization; and v) implementation of cost savings initiatives as part of a transformation plan.

Overview of Results for Fiscal 2019

During fiscal 2019, Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies increased compared to fiscal 2018 primarily due to a charge for the Purification Solutions goodwill and long-lived asset impairment in fiscal 2018 that did not reoccur in fiscal 2019, partially offset by weaker results in the Reinforcement Materials and Performance Chemicals segments in fiscal 2019 due to automotive production weakness, particularly in Asia and Europe, and lower pricing in Asia.

Fiscal 2019 compared to Fiscal 2018—Consolidated

Net Sales and Other Operating Revenues and Gross Profit

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Net sales and other operating revenues	$ 3,337	$ 3,242	$ 2,717
Gross profit	$ 685	$ 772	$ 657

The $95 million increase in net sales from fiscal 2018 to fiscal 2019 was due primarily to more favorable pricing and product mix as we passed through higher raw material costs in our pricing (combined $125 million) and the impact of presenting revenue from by-products produced in manufacturing operations in Net sales and other operating revenues ($76 million), which in fiscal 2018 was recorded within Cost of sales, partially offset by the unfavorable impact of currency translation ($87 million) and lower volumes ($24 million).

Gross profit decreased by $87 million in fiscal 2019 when compared to fiscal 2018 driven by lower unit margins in Reinforcement Materials and Performance Chemicals and lower volumes in Performance Chemicals, driven primarily by the continued competitive pricing environment in Asia and lower automotive production.

Selling and Administrative Expenses

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Selling and administrative expenses	$ 290	$ 308	$ 262

Selling and administrative expenses decreased by $18 million in fiscal 2019 when compared to fiscal 2018. The decrease was principally driven by lower discretionary spending and incentive compensation, partially offset by a higher charge in connection with our respirator liability and higher restructuring charges.

Research and Technical Expenses

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Research and technical expenses	$ 60	$ 66	$ 57

Research and technical expenses decreased by $6 million in fiscal 2019 when compared to fiscal 2018 primarily due to lower research and technical spending for certain new product technologies that have moved into commercialization phase and from lower spending in the Purification Solutions segment related to the transformation plan.

Impairment Charges and Loss on Sale

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Specialty Fluids loss on sale and asset impairment	$ 29	$ —	$ —
Purification Solutions long-lived assets impairment charge	$ —	$ 162	$ —
Purification Solutions goodwill impairment charge	$ —	$ 92	$ —

The Specialty Fluids loss on sale and asset impairment charges recorded during fiscal 2019 are described in Note D of our Notes to the Consolidated Financial Statements (“Note D”). The Purification Solutions long-lived assets and goodwill impairment charges recorded during fiscal 2018 are described in Note G.

Interest and Dividend Income

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Interest and dividend income	$ 9	$ 10	$ 9

Interest and dividend income decreased by $1 million in fiscal 2019 when compared to fiscal 2018 due to lower cash balances.

Interest Expense

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Interest expense	$ 59	$ 54	$ 53

Interest expense increased by $5 million in fiscal 2019 as compared to fiscal 2018. The increase was primarily due to interest on $300 million in registered notes issued during fiscal 2019 as well as higher rates on commercial paper borrowings.

Other Income (Expense)

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Other income (expense)	$ (1)	$ 17	$ 5

Other income (expense) changed during fiscal 2019 by $18 million as compared to fiscal 2018 primarily due to the impairment charge related to our investment in our Venezuelan equity affiliate in the second quarter of fiscal 2019 and a gain on the sale of cost method investments in fiscal 2018 that did not reoccur in fiscal 2019, partially offset by the favorable impact of foreign currency translation.

Provision (Benefit) for Income Taxes and Reconciliation of Effective Tax Rate to Operating Tax Rate

	Years Ended September 30		
	2019	2018	2017
	(Dollars in millions)		
Provision (benefit) for income taxes	$ 70	$ 193	$ 33
Effective tax rate[1]	28%	165%	10%
Impact of discrete tax items[2]:			
Unusual or infrequent items:	2%	(137)%	6%
Items related to uncertain tax positions	2%	(2)%	(1)%
Other discrete tax items	(2)%	12%	4%
Impact of certain items	(6)%	(17)%	—%
Operating tax rate	24%	21%	19%

(1) Refer to the reconciliation of computed tax expense at the federal statutory rate to the Provision (benefit) for income taxes in Note S of our Notes to the Consolidated Financial Statements.

(2) For fiscal 2019 and fiscal 2018, Impact of discrete tax items included a net discrete tax benefit of $5 million and a net discrete tax expense of $148 million, respectively. The nature of the discrete tax items fiscal 2019 and 2018 were as follows:

(i) Unusual or infrequent items during fiscal 2019 and 2018 consisted of excludible foreign exchange gains and losses in certain jurisdictions and impacts related to stock compensation deductions. Additionally, fiscal 2019 included the impact of changes in valuation allowances on beginning of year tax balances and the tax impacts of a pension settlement, and fiscal 2018 included the net tax impacts of the Tax Cuts and Jobs Act of 2017 (net tax expense of $159 million), cash management activities as well as impacts related to foreign exchange gain/loss on the remeasurement of a deferred tax liability;

(ii) Items related to uncertain tax positions during fiscal 2019 and 2018 included net tax impacts from the reversal of accruals for uncertain tax positions due to the expiration of statutes of limitations and the settlement of tax audits, the accrual of interest on uncertain tax positions, and the accrual of prior year uncertain tax positions (fiscal 2018 only), and;

(iii) Other discrete tax items during fiscal 2019 and 2018 included net tax impacts as a result of changes in non-US tax laws, various return to provision adjustments related to tax return filings and audit settlements as well as changes in valuation allowances on beginning of year tax balances (fiscal 2018 only).

We file U.S. federal and state and non-U.S. income tax returns in jurisdictions with varying statutes of limitations. Cabot and certain subsidiaries are under audit in a number of jurisdictions. It is possible that some of these audits will be resolved in fiscal 2020 and could impact our anticipated effective tax rate. We have filed our tax returns in accordance with the tax laws in each jurisdiction and maintain tax reserves for uncertain tax positions.

Tax Reform

On December 22, 2017, the U.S. enacted significant changes to federal income tax law affecting us, including a permanent reduction of the U.S. corporate income tax rate from 35% to 21%, effective January 1, 2018, as well as a 100% dividend received deduction for foreign dividends. Although the passage of the Act reduced the U.S. tax rate and effectively created a participation exemption regime for foreign earnings, there are certain other aspects of the new legislation that affect us, including in particular, immediate U.S. taxation of global intangible low-taxed income (“GILTI”) earned by foreign subsidiaries. GILTI earned by Controlled Foreign Corporations (“CFCs”) must be included currently in the gross income of the CFCs’ U.S. shareholder. GILTI is the excess of the shareholder’s “net CFC-tested income” over the net deemed tangible income return, which is currently defined as the excess of (1) 10% of the aggregate of the U.S. shareholder’s pro rata share of the qualified business asset investment of each CFC with respect to which it is a U.S. shareholder over (2) the amount of certain interest expense taken into account in the determination of net CFC-tested income. GILTI had a negative impact on earnings and this is the primary driver of the increase in our operating tax rate. In transitioning to this participation exemption regime, we were also subject, during fiscal 2018, to a one-time tax on the deemed repatriation of certain foreign earnings. We did not incur a Base Erosion Anti-Abuse Tax (“BEAT”) liability in fiscal 2019 since we did not exceed the base erosion percentage of 3% for the taxable year. A significant portion of our intercompany payments were exempted from BEAT. We will continue to analyze the applicability of the BEAT provisions on a quarterly basis.

Equity in Earnings of Affiliated Companies and Net Income (Loss) Attributable to Noncontrolling Interest, Net of Tax

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Equity in earnings of affiliated companies, net of tax	$ 1	$ 2	$ 7
Net income (loss) attributable to noncontrolling interests, net of tax	$ 29	$ 39	$ 25

Equity in earnings of affiliated companies, net of tax, decreased by $1 million in fiscal 2019 compared to fiscal 2018 primarily due to lower earnings from our Venezuelan equity affiliate, which has not been operational in recent periods due to a lack of available raw materials.

Net income (loss) attributable to noncontrolling interests, net of tax, decreased by $10 million in fiscal 2019 compared to fiscal 2018 primarily due to lower profitability of our joint ventures in China.

Net Income (Loss) Attributable to Cabot Corporation

In fiscal 2019, we reported net income (loss) attributable to Cabot Corporation of $157 million ($2.63 earnings per diluted common share). In fiscal 2018, we reported a net loss of $113 million ($1.85 loss per diluted common share). The loss in fiscal 2018 was driven by the Purification Solutions long-lived asset and goodwill impairment charges more fully discussed in Note G and the impact of tax reform in the U.S. as more fully discussed in Note S.

Fiscal 2019 compared to Fiscal 2018—By Business Segment

Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies, certain items, other unallocated items and Total segment EBIT for fiscal 2019, 2018 and 2017 are set forth in the table below. The details of certain items and other unallocated items are shown below and in Note U of our Notes to the Consolidated Financial Statements.

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies	$ 255	$ 117	$ 299
Less: Certain items, pre-tax	(87)	(248)	(3)
Less: Other unallocated items	(102)	(115)	(107)
Total segment EBIT	$ 444	$ 480	$ 409

In fiscal 2019, Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies increased by $138 million and Total Segment EBIT decreased by $36 million. The change in both Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies and Total segment EBIT was due to lower unit margins ($66 million), primarily in Reinforcement Materials and Performance Chemicals, lower volumes ($3 million) driven by Performance Chemicals and the unfavorable impact of foreign currency translation ($6 million), partially offset by lower fixed costs ($35 million). The lower unit margins were primarily driven by weaker Asia pricing due to softening automotive production. The remainder of the increase in Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies reflects the Purification Solutions asset impairment charges recorded in the second quarter of fiscal 2018 ($254 million) that did not reoccur in fiscal 2019 and the decrease in expense related to Other unallocated items ($13 million), partially offset by the Specialty Fluids loss on sale and asset impairment charge ($29 million), an impairment charge related to our Venezuelan equity affiliate ($11 million) recorded in the second quarter of fiscal 2019 and higher restructuring charges ($46 million).

Certain Items:

Details of the certain items for fiscal 2019, 2018, and 2017 are as follows:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Specialty Fluids loss on sale and asset impairment charge (Note D)	$ (29)	$ —	$ —
Legal and environmental matters and reserves	(21)	(16)	1
Global restructuring activities (Note P)	(16)	30	(3)
Equity affiliate investment impairment charge (Note M)	(11)	—	—
Acquisition and integration-related charges	(6)	(2)	—
Executive transition costs	(1)	(2)	—
Purification Solutions goodwill and long-lived assets impairment charge (Note G)	—	(254)	—
Inventory reserve adjustment	—	(13)	—
Gains (losses) on sale of investments	—	10	—
Other certain items	(3)	(1)	(1)
Total certain items, pre-tax	(87)	(248)	(3)
Tax-related certain items:			
Tax impact of certain items	7	31	1
Discrete tax items	5	(148)	25
Total tax-related certain items	12	(117)	26
Total certain items, net of tax	$ (75)	$ (365)	$ 23

An explanation of these items of expense and income is included in our discussion under the heading "Definition of Terms and Non-GAAP Financial Measures". Additional information concerning several of these items is included in our Notes to the Consolidated Financial Statements as follows: Specialty Fluids loss on sale and asset impairment charges (Note D), Global restructuring activities (Note P), Equity affiliate investment impairment charge (Note M), and Purification Solutions goodwill and long-lived assets impairment charge (Note G).

Tax-related certain items include discrete tax items, the nature of which are discussed under the heading "Provision (Benefit) for Income Taxes and Reconciliation of Effective Tax Rate to Operating Tax Rate". The tax impact of certain items is determined by (1) starting with the current and deferred income tax expense or benefit, included in Net income (loss) attributable to Cabot Corporation, net of discrete tax items, and (2) subtracting the tax expense or benefit on "adjusted earnings". Adjusted earnings is defined as the pre-tax income attributable to Cabot Corporation excluding certain items. The tax expense or benefit on adjusted earnings is calculated by applying the operating tax rate, as defined under the heading Definition of Terms and Non-GAAP Financial Measures, to adjusted earnings.

Other Unallocated Items:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Interest expense	$ (59)	$ (54)	$ (53)
Unallocated corporate costs	(50)	(61)	(50)
General unallocated income (expense)	8	2	3
Less: Equity in earnings of affiliated companies, net of tax	1	2	7
Total other unallocated items	$ (102)	$ (115)	$ (107)

A discussion of items that we refer to as "other unallocated items" can be found under the heading "Definition of Terms and Non-GAAP Financial Measures". The balances of unallocated corporate costs are primarily comprised of expenditures related to managing a public company that are not allocated to the segments and corporate business development costs related to ongoing corporate projects. The balances of General unallocated income (expense) consists of gains (losses) arising from foreign currency transactions, net of other foreign currency risk management activities, interest income, dividend income, the profit or loss related to the corporate adjustment for unearned revenue, and the impact of including the full operating results of a contractual joint venture in Purification Solutions Segment EBIT.

In fiscal 2019, Total other unallocated items changed by $13 million when compared to fiscal 2018 due to the decrease in Unallocated corporate costs for corporate projects and lower incentive compensation and the change in General Unallocated income (expense) from the favorable impact of foreign currency translation.

Reinforcement Materials

Sales and EBIT for Reinforcement Materials for fiscal 2019, 2018 and 2017 are as follows:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Reinforcement Materials Sales	$ 1,815	$ 1,774	$ 1,381
Reinforcement Materials EBIT	$ 266	$ 279	$ 193

In fiscal 2019, sales in Reinforcement Materials increased by $41 million when compared to fiscal 2018. The increase was principally driven by more favorable pricing and product mix (combined $87 million), partially offset by the unfavorable impact from foreign currency translation ($52 million). The more favorable price and product mix was primarily due to higher pricing from 2019 tire customer agreements. The unfavorable impact for foreign currency translation was from the weakening of the Euro, British pound, Canadian dollar and Chinese renminbi against the U.S. dollar.

In fiscal 2019, Reinforcement Materials EBIT decreased by $13 million when compared to fiscal 2018 driven principally by lower unit margins ($41 million) and the unfavorable impact from the change in inventory levels ($3 million), partially offset by lower fixed costs ($27 million) and higher volumes ($1 million). Lower unit margins were driven primarily by the continued competitive pricing environment in Asia and higher raw material costs, partially offset by higher pricing from 2019 calendar year contract gains. Lower fixed costs were primarily due to lower maintenance costs and lower incentive compensation.

Performance Chemicals

Sales and EBIT for Performance Chemicals for fiscal 2019, 2018 and 2017 are as follows:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Performance Additives Sales	$ 694	$ 707	$ 650
Formulated Solutions Sales	301	321	258
Performance Chemicals Sales	$ 995	$ 1,028	$ 908
Performance Chemicals EBIT	$ 152	$ 200	$ 201

In fiscal 2019, sales in Performance Chemicals decreased by $33 million when compared to fiscal 2018 primarily due to lower volumes ($22 million) and the unfavorable impact from foreign currency translation ($28 million), partially offset by more favorable pricing ($21 million) as we passed through higher raw material costs to our customers. The lower volumes were driven by lower automotive production that impacted demand for our products. The unfavorable impact from foreign currency translation was from the weakening of the Euro, British pound, Canadian dollar and Chinese renminbi against the U.S. dollar.

In fiscal 2019, EBIT in Performance Chemicals decreased $48 million compared to fiscal 2018 primarily due to lower unit margins ($23 million), lower volumes ($13 million), higher fixed costs ($5 million) and the unfavorable impact from foreign currency translation ($6 million). Lower unit margins were due to weaker product mix in Specialty Carbons and Specialty Compounds as a result of the lower volumes of higher margin products sold into the automotive and fiber end markets, partially offset by higher pricing as we passed through higher raw material costs to our customers.

Purification Solutions

Sales and EBIT for Purification Solutions for fiscal 2019, 2018 and 2017 are as follows:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Purification Solutions Sales	$ 278	$ 279	$ 281
Purification Solutions EBIT	$ 2	$ (7)	$ 6

Sales in Purification Solutions decreased by $1 million in fiscal 2019 when compared to fiscal 2018 primarily due to lower volumes ($4 million) and the unfavorable impact from foreign currency translation ($7 million), partially offset by the impact of a more favorable price and product mix (combined $11 million). The lower volumes were due to increased competition and reduced usage in the mercury removal and other flue gas applications. The favorable price and product mix was due to broad based price increases and volume growth in our higher margin specialty applications.

EBIT in Purification Solutions increased by $9 million in fiscal 2019 when compared to fiscal 2018 driven by lower fixed costs ($12 million) and the favorable impact from the sell through of lower cost inventories ($4 million), partially offset by the absence of royalty payments under a technology settlement agreement which did not reoccur in 2019 ($5 million), and lower volumes ($2 million). Lower fixed costs were driven by savings associated with an organizational re-alignment and restructuring which were put into effect throughout the course of fiscal 2019.

Specialty Fluids

Sales and EBIT for Specialty Fluids for fiscal 2019, 2018 and 2017 are as follows:

	Years Ended September 30		
	2019[(1)]	2018	2017
		(In millions)	
Specialty Fluids Sales	$ 56	$ 45	$ 41
Specialty Fluids EBIT	$ 24	$ 8	$ 9

(1) We divested our Specialty Fluids business on June 28, 2019. Refer to Note D for the terms of this transaction.

Sales in Specialty Fluids increased by $11 million in fiscal 2019 when compared to fiscal 2018. The increase was primarily due to a higher level of project activity that resulted in higher rental and sales volumes for our drilling fluids.

EBIT in Specialty Fluids increased by $16 million in fiscal 2019 when compared to fiscal 2018. The increase is primarily due to a higher level of project activity.

Outlook

Looking forward to fiscal 2020, we expect the current challenging macroeconomic conditions affecting our business will continue. Those conditions include disputes related to trade tariffs between the U.S. and China, volatile commodity prices and soft global automotive production. These challenges are driving certain customers to be cautious in their short-term purchasing behavior, which could impact our fiscal 2020 results. We do not expect this short-term behavior to have a long-term impact on the business as the conditions subside, however, and we expect EBIT growth across all segments in fiscal 2020. Reinforcement Materials is expected to benefit from favorable calendar 2020 customer agreements. We anticipate that Performance Chemicals EBIT will improve as we move through the year from the benefits of a full year of production at the new China fumed silica plant. We expect that Purification Solutions results will improve from the full year benefit of transformation actions and as we continue to grow our specialty applications. With the sale of the Specialty Fluids business in fiscal 2019, we will not have any EBIT contribution from this business in fiscal 2020.

Cash Flows and Liquidity

Overview

Our liquidity position, as measured by cash and cash equivalents plus borrowing availability, increased by $530 million during fiscal 2019, which was largely attributable to the repayment of commercial paper through the proceeds from the sale of the Specialty Fluids business, the issuance of long-term debt, increased borrowing availability under a new revolving credit agreement and lower net working capital, partially offset by share repurchases and cash dividends, and the redemption of the preferred stock issued in the NHUMO, S.A. de C.V. ("NHUMO") transaction. As of September 30, 2019, we had cash and cash equivalents of $169 million and borrowing availability under our revolving credit agreements of $1,297 million. Our U.S. revolving credit agreement supports our commercial paper program. Our non-U.S. revolving credit agreements may be used for repatriation of earnings of our foreign subsidiaries to the U.S., the repayment of indebtedness of our foreign subsidiaries owing to us or any of our subsidiaries, and for working capital and general corporate purposes.

At September 30, 2019, we were in compliance with all applicable covenants under our revolving credit facilities including the total consolidated debt to consolidated EBITDA (earnings before interest, taxes, depreciation and amortization) covenant.

A significant portion of our business occurs outside the U.S. and our cash generation does not always align geographically with our cash needs. The vast majority of our cash and cash equivalent holdings tend to be held outside the U.S. Cash held by foreign subsidiaries is generally used to finance the subsidiaries' operational activities and future investments. We use commercial paper throughout the year to manage short-term U.S. cash needs. The commercial paper balance is generally reduced at quarter-end using cash derived from customer collections, settlement of intercompany balances and short-term intercompany loans. The balance of commercial paper outstanding as of September 30, 2019 was $33 million. If additional funds are needed in the U.S., we have the ability to repatriate offshore earnings.

We generally manage our cash and debt on a global basis to provide for working capital requirements as needed by region or site. Cash and debt are generally denominated in the local currency of the subsidiary holding the assets or liabilities, except where there are operational cash flow reasons to hold non-functional currency or debt.

We anticipate sufficient liquidity from (i) cash on hand; (ii) cash flows from operating activities; and (iii) cash available from our revolving credit agreement and our commercial paper program to meet our operational and capital investment needs and financial obligations for the foreseeable future. The liquidity we derive from cash flows from operations is, to a large degree, predicated on our ability to collect our receivables in a timely manner, the cost of our raw materials, and our ability to manage inventory levels.

In May 2019, several subsidiaries entered into a revolving credit agreement with a loan commitment not to exceed 300 million Euros. The revolving credit agreement may be used for repatriation of earnings of Cabot's foreign subsidiaries to the U.S., the repayment of indebtedness of our foreign subsidiaries owing to the Company or any of its subsidiaries, and for working capital and general corporate purposes. The obligations of the subsidiaries under the revolving credit agreement are guaranteed by the Company.

In June 2019, we issued $300 million in registered notes with a coupon of 4.0% that mature on July 1, 2029. These notes are unsecured and pay interest on January 1 and July 1 commencing in January 2020. The net proceeds of this offering were $296 million after deducting discounts and issuance costs.

We issued $30 million of 7.42% medium term notes in fiscal 1999 that matured on December 11, 2018. We repaid these notes at maturity with a combination of cash on hand and commercial paper borrowings.

In November 2013, we purchased all of our joint venture partner's common stock in the former NHUMO, S.A. de C.V. ("NHUMO") joint venture. At the close of the transaction, NHUMO issued redeemable preferred stock to the joint venture partner with a repurchase value of $25 million and a fixed dividend rate of 6% per annum. In November 2018, we repurchased the preferred stock for $25 million and paid a final dividend payment of approximately $1.4 million.

The following discussion of the changes in our cash balance refers to the various sections of our Consolidated Statements of Cash Flows.

Cash Flows from Operating Activities

Cash provided by operating activities, which consists of net income adjusted for the various non-cash items included in income, changes in working capital and changes in certain other balance sheet accounts, totaled $363 million in fiscal 2019. Operating activities provided $298 million and $348 million of cash in fiscal 2018 and in fiscal 2017, respectively.

Cash provided by operating activities in fiscal 2019 was driven primarily by our net income of $186 million, the non-cash impacts of depreciation and amortization of $148 million, a decrease in Accounts and notes receivable of $73 million, the loss on the sale and asset impairment of the Specialty Fluids business of $29 million, a decrease in Inventory of $27 million, and the impairment of our investment in our Venezuelan equity affiliate of $11 million. Partially offsetting these factors were a decrease in Accounts payable and accrued liabilities of $75 million, a decrease in Other liabilities of $37 million, and the non-cash impact of a decrease in our deferred tax provision of $27 million.

Cash provided by operating activities in fiscal 2018 was driven primarily by net income, which, before non-cash depreciation, amortization and impairment charges, totaled $329 million from strong business performance and an increase in accounts payable and accrued liabilities, partially offset by increases in Accounts and notes receivable and Inventories largely driven by higher raw material costs.

In addition to the factors noted above, the following other elements of operations have a bearing on operating cash flows:

Restructurings — As of September 30, 2019, we had $7 million of total restructuring costs in accrued expenses in the Consolidated Balance Sheets related to our global restructuring activities. We made cash payments of $12 million during fiscal 2019. In fiscal 2020 and thereafter, we expect to make cash payments totaling approximately $8 million related to these restructuring plans.

Environmental Reserves and Litigation Matters—As of September 30, 2019, we had a $13 million reserve for environmental remediation costs at various sites. These sites are primarily associated with businesses divested in prior years. Additionally, as of September 30, 2019, we had a $35 million reserve for respirator claims. We expect expenditures for each of these reserves to be incurred over many years. We also have other litigation costs arising in the ordinary course of business.

Cash Flows from Investing Activities

Investing activities consumed $94 million of cash in fiscal 2019 compared to $246 million in fiscal 2018 and $149 million in fiscal 2017. In fiscal 2019, the use of cash by investing activities was primarily driven by capital expenditures of $224 million, partially offset by proceeds from the sale of the Specialty Fluids business of $135 million.

In fiscal 2018, the use of cash by investing activities was primarily driven by $64 million of cash paid for our acquisition of Tech Blend, net of cash acquired of $1 million, and capital expenditures of $229 million. These capital expenditures were for sustaining and compliance capital projects at our operating facilities as well as capacity expansion capital expenditures in Reinforcement Materials and Performance Chemicals. Offsetting these amounts was an inflow of cash related to the sales of land at our former sites in Merak, Indonesia, and Thane, India and proceeds from the sale of shares of a cost method investment in Asia.

Capital expenditures for fiscal 2020 are expected to be approximately $250 million. Our planned capital spending program for fiscal 2020 is primarily for sustaining, compliance and improvement capital projects at our operating facilities as well as capacity expansion capital expenditures in Reinforcement Materials and Performance Chemicals.

Cash Flows from Financing Activities

Financing activities consumed $236 million of cash in fiscal 2019 compared to $141 million in fiscal 2018 and $133 million in fiscal 2017. The use of cash by financing activities in fiscal 2019 primarily consisted of the repayment of $216 million of commercial paper, share repurchases of $173 million, dividend payments to stockholders of $80 million, the repayment of $75 million of long-term debt, the redemption of $25 million of preferred stock held by our former NHUMO joint venture partner, and dividend payments of $23 million to noncontrolling interests, partially offset by the proceeds from the issuance of our registered notes and borrowing under our European revolver in the aggregate of $352 million.

The use of cash in fiscal 2018 was primarily related to cash dividends paid to common stockholders of $80 million, purchases of common stock of $142 million, and cash dividends paid to noncontrolling interests of $21 million. These were offset by an increase in our overall debt balance of $80 million. The increase in debt was driven primarily by an increase in working capital and the acquisition of Tech Blend, partially offset by the proceeds from the Merak, Indonesia and Thane, India land sales.

At September 30, 2019, we had $1,297 million of availability under our credit agreements. Although we typically have an outstanding commercial paper balance during the quarter, we generally reduce the balance at quarter-end through cash receipts from collections, settlement of intercompany balances and short-term intercompany loans. There was $33 million and $249 million of commercial paper outstanding at September 30, 2019 and 2018, respectively.

Our long-term total debt, of which $7 million is current, matures at various times as presented in Note J of our Notes to the Consolidated Financial Statements. The weighted-average interest rate on our fixed rate long-term debt was 3.85% as of September 30, 2019.

Share Repurchases

In fiscal 2018, the Board of Directors' authorized us to repurchase up to 10 million shares of common stock. During fiscal 2019 and 2018, we repurchased approximately 3.6 million and 2.2 million shares of our common stock on the open market for $167 million and $138 million, respectively. Additionally, during each of fiscal 2019 and 2018, we repurchased less than one million shares of our common stock associated with employee tax obligations on stock-based compensation awards for $6 million and $4 million, respectively. As of September 30, 2019, we had approximately 5.9 million shares available for repurchase under the Board of Directors' share repurchase authorization.

Dividend Payments

In fiscal 2019 and fiscal 2018, we paid cash dividends on our common stock of $1.36 and $1.29 per share, respectively. These cash dividend payments totaled $80 million in both fiscal 2019 and fiscal 2018.

Employee Benefit Plans

As of September 30, 2019, we had a consolidated pension obligation, net of the fair value of plan assets, of $79 million, comprised of $31 million for pension benefit plan liabilities and $48 million for postretirement benefit plan liabilities.

The $31 million of unfunded pension benefit plan liabilities is derived as follows:

	U.S.	Foreign	Total
		(In millions)	
Fair value of plan assets	$ 151	$ 195	$ 346
Benefit obligation	157	220	377
Funded (unfunded) status	$ (6)	$ (25)	$ (31)

In fiscal 2019, we made cash contributions totaling approximately $8 million to our pension benefit plans. In fiscal 2020, we expect to make cash contributions of $10 million to our pension plans.

The $48 million of unfunded postretirement benefit plan liabilities is comprised of $28 million for our U.S. and $20 million for our foreign postretirement benefit plans. These postretirement benefit plans provide certain health care and life insurance benefits for retired employees. Typical of such plans, our postretirement plans are unfunded and, therefore, have no plan assets. We fund these plans as claims or insurance premiums come due. In fiscal 2019, we paid postretirement benefits of $4 million. For fiscal 2020, our benefit payments for our postretirement plans are expected to be $4 million.

In fiscal 2019, Cabot's Board of Directors approved a resolution to terminate the U.S. pension plan. We commenced the U.S. plan termination process during the third quarter of 2019 and expect to complete the transfer of the U.S. plan's assets in fiscal year 2020 pending an Internal Revenue Service determination letter. The pension liability will be settled in either a lump-sum payment or a purchased annuity. Upon settlement of the plan, we will recognize a loss with the release of approximately $13 million from Accumulated other comprehensive income (loss) in the Consolidated Balance Sheet to Other income (expense) in the Consolidated Statement of Operations.

Off-Balance Sheet Arrangements

As of September 30, 2019, we had no material transactions that meet the definition of an off-balance sheet arrangement.

Contractual Obligations

The following table sets forth our long-term contractual obligations.

	Payments Due by Fiscal Year						
	2020	2021	2022	2023	2024	Thereafter	Total
				(In millions)			
Purchase commitments	$ 281	$ 179	$ 169	$ 143	$ 137	$ 1,648	$ 2,557
Long-term debt	4	43	365	—	56	558	1,026
Capital lease obligations[1]	3	3	3	3	2	7	21
Fixed interest on long-term debt	35	35	35	21	21	79	226
Operating leases	23	14	9	9	8	68	131
Total	$ 346	$ 274	$ 581	$ 176	$ 224	$ 2,360	$ 3,961

(1) Capital lease obligations include interest.

Purchase Commitments

We have entered into long-term, volume-based purchase agreements primarily for the purchase of raw materials and natural gas with various key suppliers for all of our business segments. Under certain of these agreements the quantity of material being purchased is fixed, but the price we pay changes as market prices change. For purposes of the table above, current purchase prices have been used to quantify total commitments. We have also entered into long-term purchase agreements primarily for services related to information technology, which are not included in the table above, that total $12 million as of September 30, 2019, the majority of which is expected to be paid within the next 5 years.

Capital Leases

We have capital lease obligations primarily for certain equipment and buildings. These obligations are payable over the next 14 years.

Operating Leases

We have operating leases primarily comprised of leases for transportation vehicles, warehouse facilities, office space, and machinery and equipment.

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

We are exposed to changes in interest rates and foreign currency exchange rates because we finance certain operations through long- and short-term borrowings and denominate our transactions in a variety of foreign currencies. Changes in these rates may have an impact on future cash flows and earnings. We manage these risks through normal operating and financing activities and, when deemed appropriate, through the use of derivative financial instruments.

We have policies governing our use of derivative instruments, and we do not enter into financial instruments for trading or speculative purposes.

By using derivative instruments, we are subject to credit and market risk. The derivative instruments are booked in our balance sheet at fair value and reflect the asset or liability position as of September 30, 2019. If a counterparty fails to fulfill its performance obligations under a derivative contract, our exposure will equal the fair value of the derivative. Generally, when the fair value of a derivative contract is positive, the counterparty owes Cabot, thus creating a payment risk for Cabot. We minimize counterparty credit or repayment risk by entering into these transactions with major financial institutions of investment grade credit rating. Our exposure to market risk is not hedged in a manner that completely eliminates the effects of changing market conditions on earnings or cash flow.

Foreign Currency Risk

Our international operations are subject to certain risks, including currency exchange rate fluctuations and government actions. We have cross-currency swaps designated as hedges of our net investments in certain Euro denominated subsidiaries. The following table summarizes the principal terms of our cross-currency swaps, including the aggregate notional amount of the swaps, the interest rate payment we receive from and pay to our swap counterparties, the term and fair value at September 30, 2019.

Description	Notional Amount	Interest Rate Received	Interest Rate Paid	Fiscal Year Entered Into	Maturity Year	Fair Value at September 30, 2019
Cross Currency Swaps	USD 250 million swapped to EUR 223 million	3.40%	1.94%	2016	2026	$1 million

We also have foreign currency exposures arising from the denomination of monetary assets and liabilities in foreign currencies other than the functional currency of a given subsidiary as well as the risk that currency fluctuations could affect the dollar value of future cash flows generated in foreign currencies. Accordingly, we use short-term forward contracts to minimize the exposure to foreign currency risk. At September 30, 2019, we had $54 million in notional foreign currency contracts, which were denominated in British pound, Canadian dollar, Indonesian rupiah and Czech koruna. These forwards had a fair value of less than $1 million as of September 30, 2019.

In certain situations where we have forecasted purchases under a long-term commitment or forecasted sales denominated in a foreign currency we may enter into appropriate financial instruments in accordance with our risk management policy to hedge future cash flow exposures.

The primary currencies for which we have exchange rate exposure are the Euro, Japanese Yen, Brazilian Real, and Argentine Peso. In fiscal year 2019, foreign currency translations in the aggregate decreased our business segment EBIT by $6 million, the majority of which affected the results of the Performance Chemicals segment. The overall unfavorable impact was driven by the translation of local currency denominated revenues and costs in Europe. In addition, we recognized a net foreign exchange gain of less than $1 million in Other income (expense) in fiscal 2019 from the revaluation of monetary assets and liabilities from transactional currencies to functional currency, largely attributable to changes in the value of the Argentine Peso, partially offset by unfavorable movements in the Euro during the year.

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Item 8. ***Financial Statements and Supplementary Data***

INDEX TO FINANCIAL STATEMENTS

CABOT CORPORATION
CONSOLIDATED STATEMENTS OF OPERATIONS

	Years Ended September 30		
	2019	2018	2017
	(In millions, except per share amounts)		
Net sales and other operating revenues	$ 3,337	$ 3,242	$ 2,717
Cost of sales	2,652	2,470	2,060
Gross profit	685	772	657
Selling and administrative expenses	290	308	262
Research and technical expenses	60	66	57
Specialty Fluids loss on sale and asset impairment charge (Note D)	29	—	—
Purification Solutions long-lived assets impairment charge (Note G)	—	162	—
Purification Solutions goodwill impairment charge (Note G)	—	92	—
Income (loss) from operations	306	144	338
Interest and dividend income	9	10	9
Interest expense	(59)	(54)	(53)
Other income (expense)	(1)	17	5
Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies	255	117	299
(Provision) benefit for income taxes	(70)	(193)	(33)
Equity in earnings of affiliated companies, net of tax	1	2	7
Net income (loss)	186	(74)	273
Net income (loss) attributable to noncontrolling interests, net of tax of $6, $10 and $6	29	39	25
Net income (loss) attributable to Cabot Corporation	$ 157	$ (113)	$ 248
Weighted-average common shares outstanding:			
Basic	58.7	61.7	62.3
Diluted	58.8	61.7	62.7
Earnings per common share:			
Basic	$ 2.64	$ (1.85)	$ 3.94
Diluted	$ 2.63	$ (1.85)	$ 3.91

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

CABOT CORPORATION
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Net income (loss)	$ 186	$ (74)	$ 273
Other comprehensive income (loss), net of tax			
Foreign currency translation adjustment, net of tax (provision) benefit of ($5), $1, and $4	(69)	(64)	25
Unrealized holding gains (losses) arising during the period, net of tax provision of $—, $—, and $—	—	(1)	—
Derivatives: net investment hedges			
(Gains) losses reclassified to interest expense, net of tax provision (benefit) of $1, $2, and $—	(4)	(3)	—
(Gains) losses excluded from effectiveness testing and amortized to interest expense, net of tax provision (benefit) of $—, $(1), and $—	1	1	—
Pension and other postretirement benefit liability adjustments			
Pension and other postretirement benefit liability adjustments arising during the period, net of tax	(6)	6	41
Amortization of net loss and prior service credit included in net periodic pension cost, net of tax	1	(1)	2
Specialty Fluids divestiture	(3)	—	—
Other comprehensive income (loss)	(80)	(62)	68
Comprehensive income (loss)	106	(136)	341
Net income (loss) attributable to noncontrolling interests, net of tax	29	39	25
Foreign currency translation adjustment attributable to noncontrolling interests, net of tax	(6)	(4)	2
Comprehensive income (loss) attributable to noncontrolling interests	23	35	27
Comprehensive income (loss) attributable to Cabot Corporation	$ 83	$ (171)	$ 314

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

CABOT CORPORATION
CONSOLIDATED BALANCE SHEETS
ASSETS

	September 30 2019	September 30 2018
	(In millions, except share and per share amounts)	
Current assets:		
Cash and cash equivalents	$ 169	$ 175
Accounts and notes receivable, net of reserve for doubtful accounts of $3 and $7	530	637
Inventories	466	511
Prepaid expenses and other current assets	45	63
Total current assets	1,210	1,386
Property, plant and equipment	3,546	3,520
Accumulated depreciation	(2,198)	(2,224)
Net property, plant and equipment	1,348	1,296
Goodwill	90	93
Equity affiliates	39	52
Intangible assets, net	96	98
Assets held for rent	—	118
Deferred income taxes	163	134
Other assets	58	67
Total assets	$ 3,004	$ 3,244

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

CABOT CORPORATION
CONSOLIDATED BALANCE SHEETS
LIABILITIES AND STOCKHOLDERS' EQUITY

	September 30	
	2019	2018
	(In millions, except share and per share amounts)	
Current liabilities:		
Short-term borrowings	$ 33	$ 249
Accounts payable and accrued liabilities	537	613
Income taxes payable	22	29
Current portion of long-term debt	7	35
Redeemable preferred stock	—	26
Total current liabilities	599	952
Long-term debt	1,024	719
Deferred income taxes	41	42
Other liabilities	206	252
Commitments and contingencies (Note T)		
Stockholders' equity:		
Preferred stock:		
Authorized: 2,000,000 shares of $1 par value		
Issued and Outstanding: None and none	—	—
Common stock:		
Authorized: 200,000,000 shares of $1 par value		
Issued: 57,250,454 and 60,566,375 shares		
Outstanding 57,080,589 and 60,366,569 shares	57	61
Less cost of 169,865 and 199,806 shares of common treasury stock	(5)	(7)
Additional paid-in capital	—	—
Retained earnings	1,337	1,417
Accumulated other comprehensive income (loss)	(391)	(317)
Total Cabot Corporation stockholders' equity	998	1,154
Noncontrolling interests	136	125
Total stockholders' equity	1,134	1,279
Total liabilities and stockholders' equity	$ 3,004	$ 3,244

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

CABOT CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Cash Flows from Operating Activities:			
Net income (loss)	$ 186	$ (74)	$ 273
Adjustments to reconcile net income (loss) to cash provided by operating activities:			
Depreciation and amortization	148	149	155
Specialty Fluids loss on sale and asset impairment charge	29	—	—
Impairment of investment in equity affiliate	11	—	—
Long-lived asset impairment charge	—	162	—
Goodwill impairment charge	—	92	—
Deferred tax provision (benefit)	(27)	91	(31)
Employee benefit plan settlement	7	—	—
Gain on sale of land	—	(39)	—
Gain on sale of investments	—	(10)	—
Equity in net income of affiliated companies	(1)	(2)	(7)
Non-cash compensation	11	22	16
Other non-cash (income) expense	(3)	16	(3)
Changes in assets and liabilities:			
Accounts and notes receivable	73	(127)	(64)
Inventories	27	(105)	(61)
Prepaid expenses and other current assets	18	(27)	(14)
Accounts payable and accrued liabilities	(75)	122	91
Income taxes payable	(6)	7	(2)
Other liabilities	(37)	12	(16)
Cash dividends received from equity affiliates	2	9	11
Cash provided by operating activities	363	298	348
Cash Flows from Investing Activities:			
Additions to property, plant and equipment	(224)	(229)	(147)
Proceeds from sale of business	135	—	—
Cash paid for acquisition of business, net of cash acquired of $—, $1 and $—	(3)	(64)	—
Proceeds from the sale of land	—	39	—
Proceeds from sales of investments	—	11	—
Other	(2)	(3)	(2)
Cash used in investing activities	(94)	(246)	(149)
Cash Flows from Financing Activities:			
Borrowings under financing arrangements	29	—	1
Repayments under financing arrangements	(29)	(4)	(3)
Increase (decrease) in short-term borrowings, net	—	(4)	2
Proceeds from (repayments of) issuance of commercial paper, net	(216)	249	—
Proceeds from long-term debt, net of issuance costs	352	90	—
Repayments of long-term debt	(75)	(251)	(2)
Repayments of redeemable preferred stock	(25)	—	—
Purchases of common stock	(173)	(142)	(61)
Proceeds from sales of common stock	4	22	21
Cash dividends paid to noncontrolling interests	(23)	(21)	(14)
Cash dividends paid to common stockholders	(80)	(80)	(77)
Cash used in financing activities	(236)	(141)	(133)
Effects of exchange rate changes on cash	(39)	(16)	14
Increase (decrease) in cash and cash equivalents	(6)	(105)	80
Cash and cash equivalents at beginning of year	175	280	200
Cash and cash equivalents at end of year	$ 169	$ 175	$ 280
Income taxes paid	$ 99	$ 84	$ 69
Interest paid	$ 47	$ 47	$ 48

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

CABOT CORPORATION
CONSOLIDATED STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY
(In millions, except shares in thousands and per share amounts)

	Common Stock, Net of Treasury Stock		Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Total Cabot Corporation Stockholders' Equity	Noncontrolling Interests	Total Stockholders' Equity
	Shares	Cost						
Balance at September 30, 2016	62,211	$ 55	$ —	$ 1,561	$ (325)	$ 1,291	$ 98	$ 1,389
Net income (loss) attributable to Cabot Corporation				248		248		248
Net income (loss) attributable to noncontrolling interests						—	25	25
Total other comprehensive income (loss)					66	66	2	68
Contributions from noncontrolling interest						—	4	4
Acquisition of noncontrolling interest			(6)			(6)	6	—
Cash dividends paid to noncontrolling interests						—	(14)	(14)
Cash dividends paid to common stockholders, $1.23 per share				(77)		(77)		(77)
Issuance of stock under equity compensation plans	833	2	25			27		27
Amortization of share-based compensation			16			16		16
Purchase and retirement of common stock	(1,160)	(1)	(35)	(25)		(61)		(61)
Balance at September 30, 2017	61,884	56	—	1,707	(259)	1,504	121	1,625
Net income (loss) attributable to Cabot Corporation				(113)		(113)		(113)
Net income (loss) attributable to noncontrolling interests							39	39
Total other comprehensive income (loss)					(58)	(58)	(4)	(62)
Acquisition of noncontrolling interest			(1)			(1)	1	—
Cash dividends declared to noncontrolling interests						—	(32)	(32)
Cash dividends paid to common stockholders, $1.29 per share				(80)		(80)		(80)
Issuance of stock under equity compensation plans	733	—	22			22		22
Amortization of share-based compensation			22			22		22
Purchase and retirement of common stock	(2,250)	(2)	(43)	(97)		(142)		(142)
Balance at September 30, 2018	60,367	54	—	1,417	(317)	1,154	125	1,279
Net income (loss) attributable to Cabot Corporation				157		157		157
Net income (loss) attributable to noncontrolling interests							29	29
Total other comprehensive income (loss)					(74)	(74)	(6)	(80)
Acquisition of noncontrolling interest			(1)			(1)	1	—
Cash dividends declared to noncontrolling interests						—	(13)	(13)
Cash dividends paid to common stockholders, $1.36 per share				(80)		(80)		(80)
Issuance of stock under equity compensation plans	483	2	2			4		4
Amortization of share-based compensation			11			11		11
Purchase and retirement of common stock	(3,769)	(4)	(12)	(157)		(173)		(173)
Balance at September 30, 2019	57,081	$ 52	$ —	$ 1,337	$ (391)	$ 998	$ 136	$ 1,134

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

Notes to the Consolidated Financial Statements

Note A. Significant Accounting Policies

The consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States ("U.S."). The significant accounting policies of Cabot Corporation ("Cabot" or "the Company") are described below.

Unless otherwise indicated, all disclosures and amounts in the Notes to the Consolidated Financial Statements relate to the Company's continuing operations.

Effective October 1, 2018, the Company adopted the new revenue recognition standard that amended the pre-existing accounting standard for revenue recognition. The Company used a modified retrospective approach, which is discussed in further detail in Note B.

Effective October 1, 2018, the Company adopted the new pension standard that amended the requirements on the presentation of net periodic pension and postretirement benefit costs. The Company used a retrospective transition method to reclassify net periodic benefit cost, other than the service component, from Cost of sales, Selling and administrative expenses and Research and technical expenses to Other income (expense) in the Consolidated Statements of Operations for the prior periods presented, which is discussed in further detail in Note B.

Effective October 1, 2018, the Company realigned its business reporting structure under the Performance Chemicals segment and now combines its specialty carbons, fumed metal oxides and aerogel product lines into the Performance Additives business, and its specialty compounds and inkjet product lines into the Formulated Solutions business. Prior period Performance Chemicals segment revenue results have been recast to reflect the realignment.

In January 2019, the Company entered into an agreement to sell its Specialty Fluids business to Sinomine (Hong Kong) Rare Metals Resources Co. Limited, a wholly owned subsidiary of Sinomine Resource Group Co., Ltd. ("Sinomine"). The sale of the Specialty Fluids business closed in June 2019 and does not meet the criteria to be reported as a discontinued operation. Therefore, prior periods' consolidated financial statements and disclosures have not been recast. Refer to Note D for further details regarding the sale of the Specialty Fluids business.

Principles of Consolidation

The consolidated financial statements include the accounts of Cabot and its wholly-owned subsidiaries and majority-owned and controlled U.S. and non-U.S. subsidiaries. Additionally, Cabot considers consolidation of entities over which control is achieved through means other than voting rights, of which there were none in the periods presented. Intercompany transactions have been eliminated in consolidation.

Cash and Cash Equivalents

Cash equivalents include all highly liquid investments with a maturity of three months or less at date of acquisition. Cabot continually assesses the liquidity of cash equivalents and, as of September 30, 2019, has determined that they are readily convertible to cash.

Inventories

Inventories are stated at the lower of cost or net realizable value. The cost of Specialty Fluids inventories that were classified as assets held for rent was determined using the average cost method. The cost of all other inventories is determined using the first-in, first-out method.

Cabot periodically reviews inventory for both potential obsolescence and potential declines in anticipated selling prices. In this review, the Company makes assumptions about the future demand for and market value of the inventory, and based on these assumptions estimates the amount of any obsolete, unmarketable, slow moving, or overvalued inventory. Cabot writes down the value of these inventories by an amount equal to the difference between the cost of the inventory and its estimated net realizable value.

Investments

The Company has investments in equity affiliates and marketable securities. As circumstances warrant, all investments are subject to periodic impairment reviews. Unless consolidation is required, investments in equity affiliates, where Cabot generally owns between 20% and 50% of the affiliate, are accounted for using the equity method. Cabot records its share of the equity affiliate's results of operations based on its percentage of ownership of the affiliate. Dividends declared from equity affiliates are a return on investment and are recorded as a reduction to the equity investment value. In the second quarter of fiscal 2019, the Company recorded an impairment charge of $11 million related to its Venezuelan equity investment, which is included in Other income (expense) within the Consolidated Statements of Operations. Refer to Note M for details related to the impairment charge. At September 30, 2019 and 2018, Cabot had equity affiliate investments of $39 million and $52 million, respectively. Dividends declared and received from these investments were $4 million, $9 million and $11 million in fiscal 2019, 2018 and 2017, respectively.

Intangible Assets and Goodwill Impairment

The Company records tangible and intangible assets acquired and liabilities assumed in business combinations under the acquisition method of accounting. Amounts paid for an acquisition are allocated to the assets acquired and liabilities assumed based on their fair values at the date of acquisition. 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 requires the use of significant judgment with regard to assumptions used in the valuation model. The Company estimates the fair value of identifiable acquisition-related intangible assets principally based on projections of cash flows that will arise from these assets. The projected cash flows are discounted to determine the fair value of the assets at the dates of acquisition.

Definite-lived intangible assets, which are comprised of trademarks, customer relationships and developed technologies, are amortized over their estimated useful lives and are reviewed for impairment when indication of potential impairment exists, such as a significant reduction in cash flows associated with the assets.

Goodwill is comprised of the purchase price of business acquisitions in excess of the fair value assigned to the net tangible and identifiable intangible assets acquired. Goodwill is not amortized and is subject to impairment testing annually, or when events or changes in the business environment indicate that the carrying value of the reporting unit may exceed its fair value.

Historically, the annual goodwill impairment test was performed as of May 31. During the fourth quarter of fiscal 2019, the Company changed the date of the impairment test to August 31. This date is preferred as it better aligns with the Company's planning process, which produces a significant input to the testing, and it did not result in a material change to the Company's consolidated financial statements.

A reporting unit, for the purpose of the impairment test, is at or below the operating segment level, and constitutes a business for which discrete financial information is available and regularly reviewed by segment management. Reinforcement Materials, and the fumed metal oxides and specialty compounds product lines within Performance Chemicals, which are considered separate reporting units, carry the Company's goodwill balances as of September 30, 2019.

For the purpose of the goodwill impairment test, the Company first assesses qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount. If an initial qualitative assessment identifies that it is more likely than not that the carrying value of a reporting unit exceeds its estimated fair value, an additional quantitative evaluation is performed. Alternatively, the Company may elect to proceed directly to the quantitative goodwill impairment test. If based on the quantitative evaluation the fair value of the reporting unit is less than its carrying amount, a goodwill impairment loss would result. The goodwill impairment loss would be the amount by which the carrying value of the reporting unit, including goodwill, exceeds its fair value, limited to the total amount of goodwill allocated to that reporting unit. The fair value of a reporting unit is based on discounted estimated future cash flows. The fair value is also benchmarked against the value calculated from a market approach using the guideline public companies method. The assumptions used to estimate fair value include management's best estimates of future growth rates, operating cash flows, capital expenditures and discount rates over an estimate of the remaining operating period at the reporting unit level. Based on the Company's most recent annual goodwill impairment test performed as of August 31, 2019, the fair values of the Reinforcement Materials, Fumed Metal Oxides and Specialty Compounds reporting units were substantially in excess of their carrying values. Refer to Note G for details on the Purification Solutions goodwill impairment test and the resulting impairment charge recorded in the second quarter of fiscal 2018.

Long-lived Assets Impairment

The Company's long-lived assets primarily include property, plant and equipment, intangible assets, long-term investments and assets held for rent. The carrying values of long-lived assets are reviewed for impairment whenever events or changes in business circumstances indicate that the carrying amount of an asset may not be recoverable.

To test for impairment of assets, the Company generally uses a probability-weighted estimate of the future undiscounted net cash flows of the assets over their remaining lives to determine if the value of the asset is recoverable. Long-lived assets are grouped with other assets and liabilities at the lowest level for which independent identifiable cash flows are determinable.

An asset impairment is recognized when the carrying value of the asset is not recoverable based on the analysis described above, in which case the asset is written down to its fair value. If the asset does not have a readily determinable market value, a discounted cash flow model may be used to determine the fair value of the asset. In circumstances when an asset does not have separate identifiable cash flows, an impairment charge is recorded when the Company no longer intends to use the asset. Refer to Note G regarding the results of the recoverability test performed on the long-lived assets of the Purification Solutions segment and the resulting impairment charge recorded in the second quarter of fiscal 2018.

The Company continues to consider strategic options for its Purification Solutions business. Depending on the actions taken, there could be a negative impact on the fair value of the Purification Solutions reporting unit, which may lead to further impairment.

Property, Plant and Equipment

Property, plant and equipment are recorded at cost. Depreciation of property, plant and equipment is calculated using the straight-line method over the estimated useful lives of the related assets. The depreciable lives for buildings, machinery and equipment, and other fixed assets are generally between twenty and twenty-five years, ten and twenty-five years, and three and twenty-five years, respectively. The cost and accumulated depreciation for property, plant and equipment sold, retired, or otherwise disposed of are removed from the Consolidated Balance Sheets and resulting gains or losses are included in earnings in the Consolidated Statements of Operations. Expenditures for repairs and maintenance are charged to expenses as incurred. Expenditures for major renewals and betterments, which significantly extend the useful lives of existing plant and equipment, are capitalized and depreciated.

Capital expenditures for property, plant and equipment included in Accounts payable and accrued liabilities were approximately $23 million, $29 million and $7 million for the years ended September 30, 2019, 2018, and 2017, respectively.

Cabot capitalizes interest costs when they are part of the historical cost of acquiring and constructing certain assets that require a period of time to prepare for their intended use. During fiscal 2019, 2018 and 2017, Cabot capitalized $4 million, $2 million and $1 million of interest costs, respectively. These amounts are amortized over the lives of the related assets when they are placed in service.

Asset Retirement Obligations

Cabot estimates incremental costs for special handling, removal and disposal of materials that may or will give rise to conditional asset retirement obligations ("ARO") and then discounts the expected costs back to the current year using a credit adjusted risk free rate. Cabot recognizes ARO liabilities and costs when the timing and/or settlement can be reasonably estimated. In certain instances, Cabot has not recorded a reserve for AROs because of the indefinite life of certain assets. The ARO reserves were $26 million and $28 million at September 30, 2019 and 2018, respectively, and are included in Accounts payable and accrued liabilities and Other liabilities on the Consolidated Balance Sheets.

Foreign Currency Translation

The functional currency of the majority of Cabot's foreign subsidiaries is the local currency in which the subsidiary operates. Assets and liabilities of foreign subsidiaries are translated into U.S. dollars at exchange rates in effect at the balance sheet dates. Income and expense items are translated at average monthly exchange rates during the year. Unrealized currency translation adjustments are included as a separate component of Accumulated other comprehensive income (loss) ("AOCI") within stockholders' equity.

Realized and unrealized foreign currency gains and losses arising from transactions denominated in currencies other than the subsidiary's functional currency are reflected in earnings with the exception of (i) intercompany transactions considered to be of a long-term investment nature; (ii) income taxes upon future repatriation of unremitted earnings from non-U.S. subsidiaries that are not indefinitely reinvested; and (iii) foreign currency borrowings designated as net investment hedges. Gains or losses arising from these transactions are included as a component of Other comprehensive income (loss). In fiscal 2019, 2018 and 2017, net foreign currency transaction gains of less than $1 million, and losses of $4 million, and $4 million, respectively, are included in Other income (expense) in the Consolidated Statements of Operations.

Beginning July 1, 2018, the Argentina economy was determined to be highly inflationary. As a result, the functional currency of the Company's Argentina subsidiary was changed to the U.S. dollar, Cabot's reporting currency, which is discussed in Note M.

Share Repurchases

Periodically, Cabot repurchases shares of the Company's common stock in the open market or in privately negotiated transactions under the authorization approved by the Board of Directors as discussed in Item 5 under the heading "Issuer Purchases of Equity Securities". The Company retires the repurchased shares and records the excess of the purchase price over par value to additional paid-in capital ("APIC") until such amount is reduced to zero and then charges the remainder against retained earnings.

Financial Instruments

Cabot's financial instruments consist primarily of cash and cash equivalents, accounts and notes receivable, investments, accounts payable and accrued liabilities, short-term and long-term debt, and derivative instruments. The carrying values of Cabot's financial instruments approximate fair value with the exception of fixed rate long-term debt, which is recorded at amortized cost. The fair values of the Company's financial instruments are based on quoted market prices, if such prices are available. In situations where quoted market prices are not available, the Company relies on valuation models to derive fair value. Such valuation takes into account the ability of the financial counterparty to perform and the Company's own credit risk.

Cabot uses derivative financial instruments primarily for purposes of hedging the exposures to fluctuations in foreign currency exchange rates, which exist as part of its on-going business operations. Cabot does not enter into derivative contracts for speculative purposes, nor does it hold or issue any derivative contracts for trading purposes. All derivatives are recognized on the Consolidated Balance Sheets at fair value. Where Cabot has a legal right to offset derivative settlements under a master netting agreement with a counterparty, derivatives with that counterparty are presented on a net basis. The changes in the fair value of derivatives are recorded in either earnings or AOCI, depending on whether or not the instrument is designated as part of a hedge transaction and, if designated as part of a hedge transaction, the type of hedge transaction. The gains or losses on derivative instruments reported in AOCI are reclassified to earnings in the period in which earnings are affected by the underlying hedged item. The ineffective portion of all hedges is recognized in earnings during the period in which the ineffectiveness occurs.

In accordance with Cabot's risk management strategy, the Company may enter into certain derivative instruments that may not be designated as hedges for hedge accounting purposes. Although these derivatives are not designated as hedges, the Company believes that such instruments are closely correlated with the underlying exposure, thus managing the associated risk. The Company records in earnings the gains or losses from changes in the fair value of derivative instruments that are not designated as hedges. Cash movements associated with these instruments are presented in the Consolidated Statements of Cash Flows as Cash Flows from Operating Activities because the derivatives are designed to mitigate risk to the Company's cash flow from operations. The cash flows related to the principal amount of outstanding debt instruments are presented in the Cash Flows from Financing Activities section of the Consolidated Statements of Cash Flows.

Revenue Recognition

Cabot recognizes revenue when its customers obtain control of promised goods or services. The revenue recognized is the amount of consideration which the Company expects to receive in exchange for those goods or services. The Company's contracts with customers are generally for products only and do not include other performance obligations. Generally, Cabot considers purchase orders, which in some cases are governed by master supply agreements, to be contracts with customers. The transaction price as specified on the purchase order or sales contract is considered the standalone selling price for each distinct product. To determine the transaction price at the time when revenue is recognized, the Company evaluates whether the price is subject to adjustments, such as for returns, discounts or volume rebates, which are stated in the customer contract, to determine the net consideration to which the Company expects to be entitled. Revenue from product sales is recognized based on a point in time model when control of the product is transferred to the customer, which typically occurs upon shipment or delivery of the product to the customer and title, risk and rewards of ownership have passed to the customer. The Company has an immaterial amount of revenue that is recognized over time. Payment terms typically range from zero to ninety days.

Shipping and handling activities that occur after the transfer of control to the customer are billed to customers and are recorded as sales revenue, as the Company considers these to be fulfillment costs. Shipping and handling costs are expensed in the period incurred and included in Cost of sales within the Consolidated Statement of Operations. Taxes collected on sales to customers are excluded from the transaction price.

The Company generally provides a warranty that its products will substantially conform to the identified specifications. The Company's liability typically is limited to either a credit equal to the purchase price or replacement of the non-conforming product. Returns under warranty have historically been immaterial.

Revenue in the Specialty Fluids segment arose primarily from the rental of cesium formate. This revenue was recognized throughout the rental period based on the contracted rental terms. Customers were also billed and revenue was recognized, typically at the end of the rental period, for cesium formate product that was not returned. The Company also generated revenues from cesium formate sold outside of the rental process and from the sale of fine cesium chemicals. This revenue was recognized when control of the product transferred to the customer, which was typically upon delivery of the product.

The Company does not have contract assets or liabilities that are material.

As permitted by the revenue recognition standard, *Revenue from Contracts with Customers*, issued by the Financial Accounting Standards Board ("FASB"), when the period of time between the transfer of control of the goods and the time the customer pays for the goods is one year or less, the Company does not consider there to be a significant financing component associated with the contract.

Cost of Sales

Cost of sales consists of the cost of raw and packaging materials, direct manufacturing costs, depreciation, internal transfer costs, inspection costs, inbound and outbound freight and shipping and handling costs, plant purchasing and receiving costs and other overhead expenses necessary to manufacture the products.

Accounts and Notes Receivable

Trade receivables are recorded at the invoiced amount and generally do not bear interest. Trade receivables in China may at certain times be settled with the receipt of bank issued non-interest bearing notes. These notes totaled 30 million Chinese Renminbi ("RMB") ($4 million) and 32 million RMB ($5 million) as of September 30, 2019 and 2018, respectively, and are included in Accounts and notes receivable on the Company's Consolidated Balance Sheets. Cabot periodically sells a portion of these bank notes and other customer receivables at a discount and such sales are accounted for as asset sales. The Company does not have any continuing involvement with these notes or other customer receivables after the sale. The difference between the proceeds from the sale and the carrying value of these assets is recognized as a loss on the sale of receivables and is included in Other income (expense) in the accompanying Consolidated Statements of Operations. During fiscal 2019, 2018 and 2017, the Company recorded charges of $3 million, $3 million, and $2 million, respectively, for the sale of these assets.

Cabot maintains allowances for doubtful accounts based on an assessment of the collectability of specific customer accounts, the aging of accounts receivable and other economic information on both a historical and prospective basis. Customer account balances are charged against the allowance when it is probable the receivable will not be recovered. There were no material changes in the allowance for any of the years presented. There is no material off-balance sheet credit exposure related to customer receivable balances.

Stock-based Compensation

Cabot recognizes compensation expense for stock-based awards granted to employees using the fair value method. Under the fair value recognition provisions, stock-based compensation cost is measured at the grant date based on the fair value of the award, and is recognized as expense over the service period, which generally represents the vesting period, and includes an estimate of what level of performance the Company will achieve for Cabot's performance-based stock awards. Cabot calculates the fair value of its stock options using the Black-Scholes option pricing model. The fair value of restricted stock units is determined using the closing price of Cabot stock on the day of the grant. The Company recognizes forfeitures as they occur.

Selling and Administrative Expenses

Selling and administrative expenses consist of salaries and fringe benefits of sales and office personnel, general office expenses and other expenses not directly related to manufacturing operations.

Research and Technical Expenses

Research and technical expenses include salaries, equipment and material expenditures, and contractor fees and are expensed as incurred.

Income Taxes

Deferred income taxes are determined based on the estimated future tax effects of differences between financial statement carrying amounts and the tax bases of existing assets and liabilities. Deferred tax assets are recognized to the extent that realization of those assets is considered to be more likely than not.

A valuation allowance is established for deferred taxes when it is more likely than not that all or a portion of the deferred tax assets will not be realized. Provisions are made for the U.S. income tax liability and additional non-U.S. taxes on the undistributed earnings of non-U.S. subsidiaries, except for amounts Cabot has designated to be indefinitely reinvested.

Cabot records benefits for uncertain tax positions based on an assessment of whether the position is more likely than not to be sustained by the taxing authorities. If this threshold is not met, no tax benefit of the uncertain tax position is recognized. If the threshold is met, the tax benefit that is recognized is the largest amount that is greater than 50% likely of being realized upon ultimate settlement. This analysis presumes the taxing authorities' full knowledge of the positions taken and all relevant facts, but does not consider the time value of money. The Company also accrues for interest and penalties on its uncertain tax positions and includes such charges in its income tax provision in the Consolidated Statements of Operations.

Environmental Costs

Cabot accrues environmental costs when it is probable that a liability has been incurred and the amount can be reasonably estimated. When a single liability amount cannot be reasonably estimated, but a range can be reasonably estimated, Cabot accrues the amount that reflects the best estimate within that range or the low end of the range if no estimate within the range is better. The amount accrued reflects Cabot’s assumptions about remediation requirements at the contaminated site, the nature of the remedy, the outcome of discussions with regulatory agencies and other potentially responsible parties at multi-party sites, and the number and financial viability of other potentially responsible parties. Cabot does not reduce its estimated liability for possible recoveries from insurance carriers. Proceeds from insurance carriers are recorded when realized by either the receipt of cash or a contractual agreement.

Use of Estimates

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

Note B. Recent Accounting Pronouncements

Recently Adopted Accounting Standards

In May 2014, the FASB issued a new standard, *Revenue from Contracts with Customers*, that amended the existing accounting standards for revenue recognition. The standard requires entities to recognize revenue when they transfer promised goods or services to customers in an amount that reflects the consideration the entity expects to be entitled to in exchange for those goods or services. The Company adopted this standard on October 1, 2018 and applied a modified retrospective approach. The comparative information has not been restated and continues to be reported under the accounting standards in effect during those periods.

The adoption of this standard did not have an impact on how the Company recognizes revenue. As such, an adjustment to opening retained earnings was not required. The Company implemented the updates that were necessary to its revenue recognition policy, internal controls, processes and financial statement disclosures as part of this adoption. The updated disclosures are reflected under the heading “Revenue Recognition” within Note A and the Company’s disaggregated revenue is reflected within Note U.

In addition, as part of an assessment performed in connection with adopting this standard, the Company reviewed its classification of by-product sales, which consist of sales generated from the production of steam or electricity from the Company's energy centers primarily from its carbon black manufacturing sites and sales of hydrochloric acid generated from the production of fumed silica. Historically, the Company presented by-product sales as a reduction of Cost of sales within the Consolidated Statement of Operations. However, upon further evaluation of these sales in connection with the implementation of this standard, the Company determined that it is appropriate to present by-product sales as Net sales and other operating revenues. Effective October 1, 2018, these sales have been included within Net sales and other operating revenues in the Consolidated Statement of Operations. This change did not result in a cumulative adjustment to opening retained earnings as it is a classification change within the Consolidated Statement of Operations. If the Company had continued to classify by-product sales within Cost of sales, there would have been a decrease to Net sales and other operating revenues and Cost of sales of $76 million for the year ended September 30, 2019.

In August 2016, the FASB issued final amendments to clarify how entities should classify certain cash receipts and cash payments on the statement of cash flows, such as distributions received from equity method investees, proceeds from the settlement of insurance claims, and proceeds from the settlement of corporate-owned life insurance policies. The Company adopted this standard on October 1, 2018. The adoption of this standard did not have a material impact to the Company’s consolidated financial statements.

In March 2017, the FASB issued a new standard that amends the requirements on the presentation of net periodic pension and postretirement benefit costs. The new standard requires the service cost component to be presented with other employee compensation costs. The other components will be reported separately outside of operations. Only the service cost component will be eligible for capitalization. Entities are required to use a retrospective transition method to adopt the requirement for separate income statement presentation of the service cost and other components, and a prospective transition method to adopt the requirement to limit the capitalization of benefit cost to the service component. The Company adopted the standard on October 1, 2018 and used a retrospective transition method to reclassify net periodic benefit cost, other than the service component, from Cost of sales, Selling and administrative expenses and Research and technical expenses to Other income (expense) in the Consolidated Statements of Operations for the prior periods presented. In accordance with the standard, the Company utilized prior period footnote disclosures as a practical expedient to apply these retrospective presentations, which is shown in the table below:

Consolidated Statements of Operations	**Years Ended September 30**					
	2018			**2017**		
	As Originally Reported	**Effect of Change**	**As Adjusted**	**As Originally Reported**	**Effect of Change**	**As Adjusted**
Cost of sales	$ 2,461	$ 9	$ 2,470	$ 2,054	$ 6	$ 2,060
Gross profit	$ 781	$ (9)	$ 772	$ 663	$ (6)	$ 657
Selling and administrative expenses	$ 305	$ 3	$ 308	$ 260	$ 2	$ 262
Research and technical expenses	$ 66	$ —	$ 66	$ 56	$ 1	$ 57
Income (loss) from operations	$ 156	$ (12)	$ 144	$ 347	$ (9)	$ 338
Other income (expense)	$ 5	$ 12	$ 17	$ (4)	$ 9	$ 5

In August 2018, the FASB issued a new standard to align the requirements for capitalizing implementation costs incurred in a cloud computing arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software. The updated guidance also requires an entity to expense the capitalized implementation costs of a cloud computing arrangement that is a service contract over the term of the arrangement and includes expanded disclosure requirements for such costs. The Company adopted this standard prospectively on January 1, 2019. The adoption of this standard did not have a material impact to the Company’s consolidated financial statements.

Recently Issued Accounting Pronouncements

In February 2016, the FASB issued a new standard for the accounting for leases. This new standard requires lessees to recognize assets and liabilities for most leases, but recognize expenses on their income statements in a manner that is similar to the current accounting treatment for leases. The standard is applicable for fiscal years beginning after December 15, 2018 and for interim periods within those years, and early adoption is permitted. The Company adopted the standard on October 1, 2019 using the modified retrospective optional transition method, in which case prior periods presented will not be restated. The Company elected the package of practical expedients, which, among other things, permits the Company to not reassess the identification, classification and initial direct costs of leases commencing before the October 1, 2019 effective date and not include short-term leases on the balance sheet. The Company’s implementation team completed analyzing the current portfolio of leases and is currently developing its lease disclosures beginning with quarterly reporting for the period ended December 31, 2019. As of the date of implementation, October 1, 2019, the impact of the adoption was estimated to result in recognition of a right of use asset and lease payable obligation on the Company’s consolidated balance sheet of approximately $100 million to $120 million. The implementation team was responsible for evaluating and designing the necessary changes to the Company’s business processes, lease policies, systems and internal controls to support recognition and disclosure under the new guidance.

In June 2016, the FASB issued a new standard on measurement of credit losses. The standard introduces a new "expected loss" impairment model that applies to most financial assets measured at amortized cost and certain other instruments, including trade and other receivables and other financial assets. Entities are required to estimate expected credit losses over the life of financial assets and record an allowance against the assets’ amortized cost basis to present them at the amount expected to be collected. The new standard is effective for fiscal years beginning after December 15, 2019 and early adoption is permitted. The Company is evaluating this standard and the timing of its adoption. The Company does not expect the adoption of this standard to materially impact the Company’s consolidated financial statements.

In February 2018, the FASB issued a new standard that allows entities to reclassify from AOCI to Retained earnings stranded tax effects resulting from changes made as a result of the Tax Cuts and Jobs Act of 2017 (the "Act"). The amendments in this new standard also require certain disclosures about stranded tax effects. The new standard is effective for all entities for fiscal years beginning after December 15, 2018, including interim periods within those years, and early adoption is permitted. The Company adopted the standard on October 1, 2019. The Company does not expect the adoption of this standard to materially impact the Company's consolidated financial statements.

Note C. Acquisitions

Tech Blend

In November 2017, the Company acquired Tech Blend, a North American producer of black masterbatches, for a purchase price of $65 million, paid in cash. The purchase price was subject to a working capital adjustment, which was immaterial. The operating results of the business are included in the Company's Performance Chemicals segment. The acquisition extends the Company's global footprint in black masterbatch and compounds and provides a platform to serve global customers and grow in conductive formulations.

NSCC Carbon (Jiangsu) Co. Ltd

In September 2018, the Company acquired NSCC Carbon, a carbon black manufacturing facility in Pizhou, Jiangsu Province, China for a purchase price of $8 million. The purchase price conditions were satisfied in September 2019 and the purchase price is expected to be paid in the first quarter of fiscal 2020. The accrual for this payment is currently recorded within Accounts payable and accrued liabilities on the Consolidated Balance Sheets. The Company plans to modify this facility to produce specialty carbons and therefore the plant is temporarily mothballed. The modifications are expected to be completed, and production is expected to commence, in 2021. During the fiscal year ended 2019 the Company has incurred $4 million of transition-related costs associated with this acquisition.

Other Acquisition

In June 2019, the Company acquired certain intangible assets from a leading masterbatch producer in Asia. The total purchase price of $3 million was allocated to customer relationships and is presented in Intangible assets, net on the Consolidated Balance Sheets. The acquisition extends the Company's global footprint in black masterbatch.

Note D. Sale of the Specialty Fluids Business

In June 2019, the Company completed the sale of its Specialty Fluids business, an operating segment of the Company, to Sinomine for total proceeds of $133 million, net of $2 million cash transferred, subject to customary post-closing adjustments that are not expected to be material.

The Company recognized a pre-tax loss on the sale of the Specialty Fluids business of $9 million in fiscal 2019 and a $20 million impairment charge during the second quarter of fiscal 2019. The sale of the Specialty Fluids business does not meet the criteria to be reported as a discontinued operation as it does not constitute a significant strategic business shift for the Company, and has no major effect on operations.

As part of the sale, the Company may receive additional cash royalties of up to $5 million for lithium products, payable over a ten-year period.

Note E. Inventories

Inventories, net of obsolete, unmarketable and slow moving reserves, are as follows:

	September 30	
	2019	2018
	(In millions)	
Raw materials	$ 107	$ 129
Work in process	—	3
Finished goods	305	329
Other	54	50
Total	$ 466	$ 511

Other inventory is comprised of certain spare parts and supplies.

Cabot periodically reviews inventory for both obsolescence and loss of value. In this review, Cabot makes assumptions about the future demand for and market value of the inventory and, based on these assumptions, estimates the amount of obsolete, unmarketable or slow moving inventory. At September 30, 2019 and 2018, total inventory reserves were $29 million and $38 million, respectively. During fiscal year 2018, the Company recorded a lower of cost or market charge in the amount of $13 million related to its Purification Solutions inventory held at several sites in North America and Europe.

Note F. Property, Plant and Equipment

Property, plant and equipment consists of the following:

	September 30	
	2019	2018
	(In millions)	
Land and land improvements	$ 144	$ 142
Buildings	524	514
Machinery and equipment	2,369	2,373
Other	247	249
Construction in progress	262	242
Total property, plant and equipment	3,546	3,520
Less: Accumulated depreciation	(2,198)	(2,224)
Net property, plant and equipment	$ 1,348	$ 1,296

Depreciation expense was $142 million for each of fiscal 2019 and 2018 and $147 million for fiscal 2017.

Note G. Purification Solutions Goodwill and Long-Lived Assets Impairment Charges

During the second quarter of fiscal 2018, the Company recorded impairment charges relating to the goodwill and long-lived assets of the Purification Solutions reporting unit, and an associated deferred tax benefit, in the Consolidated Statements of Operations as follows:

	Three Months Ended March 31, 2018
	(In millions)
Purification Solutions goodwill impairment charge	$ 92
Purification Solutions long-lived assets impairment charge	162
Benefit for income taxes	(30)
Impairment charges, after tax	$ 224

In the second quarter of fiscal 2018, the Purification Solutions reporting unit had experienced market share losses, lower customer demand and declining prices in the mercury removal and North America powdered activated carbon applications, which led the Company to reassess its previous estimates for expected growth in volumes, prices and margins in the reporting unit. Due to the revised forecasts at the time, the Company performed a quantitative goodwill impairment test and determined that the estimated fair value of the Purification Solutions reporting unit was lower than the reporting unit's carrying value, resulting in a goodwill impairment charge of $92 million.

Prior to determining the goodwill impairment charge, the Company considered whether the assets of the reporting unit, which is also considered the asset group, were recoverable. As a result of this assessment, the Company recorded an inventory reserve adjustment of $13 million and impairments to long lived assets of $162 million. The adjustment to inventory carrying value was determined based on reassessments of volumes, pricing, and margins for the reporting unit at the time and was recorded in Cost of sales in the Consolidated Statements of Operations. The impairment analysis to assess if definite-lived intangible assets and property, plant and equipment were recoverable was based on the estimated undiscounted cash flows of the reporting unit, and these cash flows were not sufficient to recover the carrying value of the long-lived assets over their remaining useful lives. Accordingly, the Company recorded impairment charges of $64 million and $98 million, to its definite-lived intangible assets and property, plant and equipment, respectively, in the second quarter of fiscal 2018 based on the lower of the carrying amount or fair value of the long-lived assets.

Cabot will continue to monitor for events or changes in business circumstances that may indicate that the remaining carrying value of the asset group may not be recoverable.

The Company recorded a tax benefit related to the impairment charges of $30 million in the second quarter of fiscal 2018 which was subsequently reduced by $1 million after the impairment charges by tax jurisdiction were finalized in the fourth quarter of fiscal 2018.

Note H. Goodwill and Intangible Assets

The carrying amount of goodwill attributable to each reportable segment with goodwill balances and the changes in those balances during the period ended September 30, 2019 are as follows:

	Reinforcement Materials	Performance Chemicals	Purification Solutions [(1)]	Total
	(In millions)			
Balance at September 30, 2018	$ 52	$ 41	$ —	$ 93
Foreign currency impact	(2)	(1)	—	(3)
Balance at September 30, 2019	$ 50	$ 40	$ —	$ 90

(1) The Company has incurred $444 million accumulated impairment losses associated with the goodwill of the Purification Solutions segment as of both September 30, 2019 and September 30, 2018. There are no accumulated impairment losses associated with the goodwill of the Reinforcement Materials or Performance Chemicals segments.

The following table provides information regarding the Company's intangible assets:

	September 30, 2019			September 30, 2018		
	Gross Carrying Value	Accumulated Amortization	Net Intangible Assets	Gross Carrying Value	Accumulated Amortization	Net Intangible Assets
	(In millions)					
Intangible assets with finite lives						
Developed technologies	$ 50	$ (5)	$ 45	$ 52	$ (2)	$ 50
Trademarks	8	—	8	8	—	8
Customer relationships	57	(14)	43	51	(11)	40
Total intangible assets	$ 115	$ (19)	$ 96	$ 111	$ (13)	$ 98

Intangible assets are amortized over their estimated useful lives, which range between twelve and twenty-five years, with a weighted average amortization period of approximately 19 years. Amortization expense for the years ended September 30, 2019, 2018 and 2017 was $6 million, $7 million and $8 million, respectively, and is included in Cost of sales, Selling and administrative expenses, and Research and technical expenses in the Consolidated Statements of Operations. Total amortization expense is estimated to be approximately $6 million each year for the next five fiscal years.

Note I. Accounts Payable, Accrued Liabilities and Other Liabilities

Accounts payable and accrued liabilities included in current liabilities consist of the following:

	September 30	
	2019	2018
	(In millions)	
Accounts payable	$ 390	$ 446
Accrued employee compensation	51	70
Other accrued liabilities	96	97
Total	$ 537	$ 613

Other long-term liabilities consist of the following:

	September 30	
	2019	2018
	(In millions)	
Employee benefit plan liabilities	$ 91	$ 118
Non-current tax liabilities	12	19
Other accrued liabilities	103	115
Total	$ 206	$ 252

Note J. Debt and Other Obligations

Long-term Obligations

The Company's long-term obligations, the fiscal year in which they mature and their respective interest rates are summarized below:

	September 30	
	2019	2018
	(In millions)	
Variable Rate Debt:		
Revolving Credit Facility, expires fiscal 2023	$ —	$ —
Revolving Credit Facility - Canada, expires fiscal 2021	43	90
Revolving Credit Facility - Euro, expires fiscal 2024	56	—
Total variable rate debt	99	90
Fixed Rate Debt:		
3.7% Notes due fiscal 2022	350	350
3.4% Notes due fiscal 2026	250	250
4.0% Notes due fiscal 2029	300	—
Medium Term Notes:		
Notes matured fiscal 2019, 7.42%	—	30
Notes due fiscal 2022, 8.34% — 8.47%	15	15
Notes due fiscal 2028, 6.57% — 7.28%	8	8
Total Medium Term Notes	23	53
Chinese Renminbi Debt, matured fiscal 2019, 4.35%	—	4
Chinese Renminbi Debt, due fiscal 2020, 4.35%	4	—
Total fixed rate debt	927	657
Capital lease obligations, due through fiscal 2033	12	11
Unamortized debt issuance costs and debt discount	(7)	(4)
Total debt	1,031	754
Less current portion of long-term debt	(7)	(35)
Total long-term debt	$ 1,024	$ 719

Revolving Credit Facility, expiring fiscal 2023— In October 2015, the Company entered into a revolving credit agreement with a loan commitment not to exceed $1 billion. The amount available for borrowing under the revolving credit agreement was $967 million as of September 30, 2019. The revolving credit agreement, which matures on October 23, 2022, supports the Company's commercial paper program. Borrowings may be used for working capital, letters of credit and other general corporate purposes. The revolving credit agreement contains affirmative and negative covenants, a single financial covenant (consolidated total debt to consolidated EBITDA, as defined in the credit agreement) and events of default customary for financings of this type.

Revolving Credit Facility-Canada expiring fiscal 2021—In September 2018, a Canadian subsidiary entered into a revolving credit agreement with a loan commitment not to exceed 100 million U.S. dollars. The amount available for borrowing under this revolving credit agreement was $57 million as of September 30, 2019, and the weighted average interest rate on the outstanding balance during the year was 3.21%. The revolving credit agreement, which matures on September 24, 2021, subject to the right to request a one-year extension, may be used for working capital, capital expenditures and other general corporate purposes. The revolving credit agreement is guaranteed by Cabot Corporation.

Revolving Credit Facility-Euro, expiring fiscal 2024—In May 2019, several subsidiaries entered into a revolving credit agreement with a loan commitment not to exceed 300 million Euros. The amount available for borrowing under this revolving credit agreement was $272 million as of September 30, 2019, and the weighted average interest rate on the outstanding balance during the year was 3.42%. The revolving credit agreement, which matures on the earlier of (i) May 22, 2024 and (ii) the date of maturity, termination or expiration of the Corporate revolving credit facility, may be used for repatriation of earnings of Cabot's foreign subsidiaries to the U.S., the repayment of indebtedness of the Company's foreign subsidiaries owing to the Company or any of its subsidiaries, and for working capital and general corporate purposes. The obligations of the subsidiaries under the revolving credit agreement are guaranteed by the Company. The Company paid debt issuance costs of $1 million upon entering the agreement, which are being amortized over the life of the revolver.

Chinese Renminbi Debt—The Company's consolidated Chinese subsidiaries had $4 million of unsecured long-term debt outstanding with a noncontrolling shareholder of a consolidated subsidiary as of both September 30, 2019 and 2018.

2.55% Notes matured fiscal 2018—In July 2012, Cabot issued $250 million in registered notes with a coupon of 2.55% that matured on January 15, 2018. These notes were unsecured and paid interest on January 15 and July 15. The net proceeds of this offering were $248 million after deducting discounts and issuance costs. The discount of less than $1 million was recorded at issuance and was amortized over the life of the notes. The notes were paid in full during the second quarter of fiscal 2018.

3.7% Notes due fiscal 2022—In July 2012, Cabot issued $350 million in registered notes with a coupon of 3.7% that mature on July 15, 2022. These notes are unsecured and pay interest on January 15 and July 15. The net proceeds of this offering were $347 million after deducting discounts and issuance costs. The discount of less than $1 million was recorded at issuance and is being amortized over the life of the notes.

3.4% Notes due fiscal 2026—In September 2016, Cabot issued $250 million in registered notes with a coupon of 3.4% that mature on September 15, 2026. These notes are unsecured and pay interest on March 15 and September 15. The net proceeds of this offering were $248 million after deducting discounts and issuance costs. The discount of less than $1 million was recorded at issuance and is being amortized over the life of the notes.

4.0% Notes due fiscal 2029—In June 2019, Cabot issued $300 million in registered, unsecured, notes with a coupon of 4.0% that mature on July 1, 2029. Interest is payable under the notes semi-annually on January 1 and July 1 commencing in January 2020. The net proceeds of this offering were $296 million after deducting discounts and issuance costs of $1 million and $3 million, respectively, which were paid at issuance and are being amortized over the life of the notes.

Medium Term Notes—At September 30, 2019 and 2018, there were $23 million and $53 million, respectively, of unsecured medium term notes outstanding issued to numerous lenders with various fixed interest rates and maturity dates. The weighted average maturity of the total outstanding medium term notes is 5 years with a weighted average interest rate of 7.96%.

Capital Lease Obligations—Cabot had capital lease obligations for certain equipment and buildings with a recorded value of $12 million and $11 million at September 30, 2019 and 2018, respectively. Cabot will make payments totaling $21 million over the next 14 years, including $9 million of imputed interest. At both September 30, 2019 and 2018, the original cost of capital lease assets was $20 million. At both September 30, 2019 and 2018, the associated accumulated depreciation of assets under capital leases was $13 million. The amortization related to those assets under capital lease is included in depreciation expense.

Future Years Payment Schedule

The aggregate principal amounts of long-term debt and capital lease obligations due in each of the five years from fiscal 2020 through 2024 and thereafter are as follows:

Years Ending September 30	Principal Payments on Long-Term Debt	Payments on Capital Lease Obligations	Total
		(In millions)	
2020	$ 4	$ 3	$ 7
2021	43	3	46
2022	365	3	368
2023	—	3	3
2024	56	2	58
Thereafter	558	7	565
Less: Interest	—	(9)	(9)
Total	$ 1,026	$ 12	$ 1,038

Standby letters of credit—At September 30, 2019, the Company had provided standby letters of credit that were outstanding and not drawn totaling $5 million, which expire through fiscal 2020.

Short-term Borrowings

Commercial Paper—The Company has a commercial paper program and the maximum aggregate balance of commercial paper notes outstanding and the amounts borrowed under the revolving credit facility may not exceed the borrowing capacity of $1 billion under the revolving credit facility. The proceeds from the issuance of the commercial paper have been used for general corporate purposes, which may include working capital, refinancing existing indebtedness, capital expenditures, share repurchases, and acquisitions. The revolving credit facility is available to repay the outstanding commercial paper, if necessary.

There was an outstanding balance of commercial paper of $33 million as of September 30, 2019 with a weighted average interest rate of 2.27% and an outstanding balance of $249 million as of September 30, 2018 with a weighted average interest rate of 2.36%.

Short-term Notes Payable—There were no short term notes payable as of both September 30, 2019 and 2018.

Redeemable Preferred Stock

In November 2013, the Company purchased all of its joint venture partner's common stock in the former NHUMO, S.A. de C.V. ("NHUMO") joint venture. At the close of the transaction, NHUMO issued redeemable preferred stock to the joint venture partner with a repurchase value of $25 million and a fixed dividend rate of 6% per annum. In November 2018, the Company repurchased the preferred stock for $25 million and paid a final dividend payment of approximately $1.4 million. The preferred stock was accounted for as a financing obligation and was separately presented in the Consolidated Balance Sheets as a current liability as of September 30, 2018.

Note K. Financial Instruments and Fair Value Measurements

The FASB authoritative guidance on fair value measurements defines fair value, provides a framework for measuring fair value, and requires certain disclosures about fair value measurements. The required disclosures focus on the inputs used to measure fair value. The guidance establishes the following hierarchy for categorizing these inputs:

Level 1 — Quoted market prices in active markets for identical assets or liabilities

Level 2 — Significant other observable inputs (e.g., quoted prices for similar items in active markets, quoted prices for identical or similar items in markets that are not active, inputs other than quoted prices that are observable such as interest rate and yield curves, and market-corroborated inputs)

Level 3 — Significant unobservable inputs

There were no transfers of financial assets or liabilities measured at fair value between Level 1 and Level 2, and there were no Level 3 investments during fiscal 2019 or 2018.

At both September 30, 2019 and 2018, Cabot had derivatives relating to foreign currency risks carried at fair value. At September 30, 2019, the fair value of these derivatives was a net asset of $1 million and was included in Prepaid expenses and other current assets and Other assets on the Consolidated Balance Sheets. At September 30, 2018, the fair value of these derivatives was a net liability of $18 million and was included in Prepaid expenses and other current assets and Other liabilities on the Consolidated Balance Sheets. These derivatives are classified as Level 2 instruments within the fair value hierarchy as the fair value determination was based on observable inputs.

At September 30, 2019 and 2018, the fair value of Guaranteed investment contracts, included in Other assets on the Consolidated Balance Sheets, was $10 million and $11 million, respectively. Guaranteed investment contracts were classified as Level 2 instruments within the fair value hierarchy as the fair value determination was based on other observable inputs.

At both September 30, 2019 and 2018, the fair values of cash and cash equivalents, accounts and notes receivable, accounts payable and accrued liabilities, and short term borrowings and variable rate debt approximated their carrying values due to the short-term nature of these instruments. The carrying value and fair value of the long-term fixed rate debt were $1,026 million and $1,095 million, respectively, as of September 30, 2019 and $747 million and $742 million, respectively, as of September 30, 2018. The fair values of Cabot's fixed rate long-term debt are estimated based on comparable quoted market prices at the respective period ends. The carrying amounts of Cabot's floating rate long-term debt and capital lease obligations approximate their fair values. All such measurements are based on observable inputs and are classified as Level 2 within the fair value hierarchy. The valuation technique used is the discounted cash flow model.

Note L. Derivatives

Risk Management

Cabot's business operations are exposed to changes in interest rates, foreign currency exchange rates and commodity prices because Cabot finances certain operations through long and short-term borrowings, denominates transactions in a variety of foreign currencies and purchases certain commoditized raw materials. Changes in these rates and prices may have an impact on future cash flows and earnings. The Company manages these risks through normal operating and financing activities and, when deemed appropriate, through the use of derivative financial instruments.

The Company has policies governing the use of derivative instruments and does not enter into financial instruments for trading or speculative purposes.

By using derivative instruments, Cabot is subject to credit and market risk. If a counterparty fails to fulfill its performance obligations under a derivative contract, Cabot's credit risk will equal the fair value of the derivative. Generally, when the fair value of a derivative contract is positive, the counterparty owes Cabot, thus creating a payment risk for Cabot. The Company minimizes counterparty credit (or repayment) risk by entering into transactions with major financial institutions of investment grade credit rating. Cabot's exposure to market risk is not hedged in a manner that completely eliminates the effects of changing market conditions on earnings or cash flow. No significant concentration of credit risk existed at September 30, 2019 and 2018.

Interest Rate Risk Management

Cabot's objective is to maintain a certain fixed-to-variable interest rate mix on the Company's debt obligations. Cabot may enter into interest rate swaps as a hedge of the underlying debt instruments to effectively change the characteristics of the interest rate without changing the debt instrument. As of both September 30, 2019 and 2018, there were no derivatives held to manage interest rate risk.

Foreign Currency Risk Management

Cabot's international operations are subject to certain risks, including currency exchange rate fluctuations and government actions. Cabot endeavors to match the currency in which debt is issued to the currency of the Company's major, stable cash receipts. In some situations, Cabot has issued debt denominated in U.S. dollars and then entered into cross-currency swaps that exchange the dollar principal and interest payments into Euro denominated principal and interest payments.

Additionally, the Company has foreign currency exposure arising from its net investments in foreign operations. Cabot may enter into cross-currency swaps to mitigate the impact of currency rate changes on the Company's net investments.

The Company also has foreign currency exposure arising from the denomination of monetary assets and liabilities in foreign currencies other than the functional currency of a given subsidiary as well as the risk that currency fluctuations could affect the dollar value of future cash flows generated in foreign currencies. Accordingly, Cabot uses short-term forward contracts to minimize the exposure to foreign currency risk. In certain situations where the Company has forecasted purchases under a long-term commitment or forecasted sales denominated in a foreign currency, Cabot may enter into appropriate financial instruments in accordance with the Company's risk management policy to hedge future cash flow exposures.

The following table provides details of the derivatives held as of September 30, 2019 and 2018 to manage foreign currency risk.

		Notional Amount		
Description	**Borrowing**	**September 30, 2019**	**September 30, 2018**	**Hedge Designation**
Cross Currency Swaps	3.4% Notes	USD 250 million swapped to EUR 223 million	USD 250 million swapped to EUR 223 million	Net investment
Forward Foreign Currency Contracts[(1)]	N/A	USD 54 million	USD 18 million	No designation

(1) Cabot's forward foreign exchange contracts are denominated in British pound, Canadian dollar, Indonesian rupiah and Czech koruna.

Accounting for Derivative Instruments and Hedging Activities

The Company determines the fair value of financial instruments using quoted market prices whenever available. When quoted market prices are not available for various types of financial instruments (such as forwards, options and swaps), the Company uses standard models with market-based inputs, which take into account the present value of estimated future cash flows and the ability of Cabot or the financial counterparty to perform. For interest rate and cross-currency swaps, the significant inputs to these models are interest rate curves for discounting future cash flows and are adjusted for credit risk. For forward foreign currency contracts, the significant inputs are interest rate curves for discounting future cash flows, and exchange rate curves of the foreign currency for translating future cash flows.

Fair Value Hedge

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

Cash Flow Hedge

For derivative instruments that are designated and qualify as cash flow hedges, the effective portion of the gain or loss on the derivative is recorded in AOCI and reclassified to earnings in the same period or periods during which the hedged transaction affects earnings. Gains and losses on the derivative representing either hedge ineffectiveness or hedge components excluded from the assessment of effectiveness are recognized in current period earnings.

Net Investment Hedge

For net investment hedges, changes in the fair value of the effective portion of the derivatives' gains or losses are reported as foreign currency translation gains or losses in AOCI while changes in the ineffective portion are reported in earnings. Effectiveness is assessed based on the hypothetical derivative method. The gains or losses on derivative instruments reported in AOCI are reclassified to earnings in the period in which earnings are affected by the underlying item, such as a disposal or substantial liquidations of the entities being hedged.

The Company has cross-currency swaps with a notional amount of $250 million, which are designated as hedges of its net investments in certain Euro denominated subsidiaries. Cash settlements occur semi-annually on March 15th and September 15th for fixed rate interest payments and a cash exchange of the notional currency amount will occur at the end of the term in 2026. During fiscal 2019 and fiscal 2018, the Company received net cash interest of $4 million and $3 million, respectively. As of September 30, 2019, the fair value of these swaps was a net asset of $1 million and was included in Prepaid expenses and other current assets and Other assets, and the cumulative gain of $5 million was included in AOCI on the Consolidated Balance Sheets. As of September 30, 2018, the fair value of these swaps was a net liability of $18 million and was included in Prepaid expenses and other current assets and Other liabilities, and the cumulative loss of $14 million was included in AOCI on the Consolidated Balance Sheets.

The following table summarizes the impact of the cross-currency swaps to AOCI and the Consolidated Statements of Operations:

	Years Ended September 30								
	2019	2018	2017	2019	2018	2017	2019	2018	2017
Description	Gain/(Loss) Recognized in AOCI			(Gain)/Loss Reclassified from AOCI into Interest Expense in the Consolidated Statements of Operations			(Gain)/Loss Recognized in Interest Expense in the Consolidated Statements of Operations (Amount Excluded from Effectiveness Testing)		
	(In millions)								
Cross-currency swaps	$ 23	$ (2)	$ (10)	$ (5)	$ (5)	$ —	$ 1	$ 2	$ —

Other Derivative Instruments

From time to time, the Company may enter into certain derivative instruments that may not be designated as hedges for accounting purposes, which may include cross-currency swaps, foreign currency forward contracts and commodity derivatives. For cross-currency swaps and foreign currency forward contracts not designated as hedges, the Company uses standard models with market-based inputs. The significant inputs to these models are interest rate curves for discounting future cash flows, and exchange rate curves of the foreign currency for translating future cash flows. In determining the fair value of the commodity derivatives, the significant inputs to valuation models are quoted market prices of similar instruments in active markets. Although these derivatives do not qualify for hedge accounting, Cabot believes that such instruments are closely correlated with the underlying exposure, thus managing the associated risk. The gains or losses from changes in the fair value of derivative instruments that are not accounted for as hedges are recognized in current period earnings.

At both September 30, 2019 and 2018, the fair value of derivative instruments not designated as hedges were immaterial. At September 30, 2019 and 2018, these instruments were presented in Prepaid expenses and other current assets and Accounts payable and accrued liabilities and, respectively, on the Consolidated Balance Sheets.

Note M. Hyperinflationary Economies

Argentina

Cabot owns 100% of a carbon black operating entity in Argentina. Beginning on July 1, 2018, the operating entity was considered to be functioning in a highly inflationary economy and began using Cabot's reporting currency, the U.S. dollar, as its functional currency. There was no financial statement impact at the date of conversion due to the change in functional currency. Since the conversion, all impacts of foreign exchange changes between the reporting currency and Argentine peso are reflected in earnings in the Consolidated Statements of Operations.

The Company's income from operations was not significantly impacted from this change since the operating entity's sales and a portion of its raw material purchases were already denominated in U.S. dollars. The operating entity's net revenue represented approximately 3% and 2% of Cabot's total net revenue for the years ended September 30, 2019 and 2018, respectively.

The operating entity's assets and liabilities held in local currency, which consist primarily of cash and cash equivalents, inventories, property, plant and equipment and accounts payable and accrued liabilities, made up less than 2% of Cabot's total assets and total liabilities as of both September 30, 2019 and 2018. Changes in the Argentine peso exchange rate result in foreign currency exchange gains or losses on the operating entity's peso-denominated monetary assets and liabilities. For the years ended September 30, 2019 and 2018, the Company recorded a net gain of $2 million and $3 million, respectively, within Other (income) expense in the Consolidated Statements of Operations, which reflects the remeasurement of the operating entity's net monetary liabilities denominated in Argentine pesos using an exchange rate of 57.32 and 39.70 Argentine pesos to the U.S. dollar at September 30, 2019 and 2018, respectively.

The Company will continue to monitor the developments in Argentina and their potential impact on the operating entity's operations or carrying value.

Venezuela

Cabot owns 49% of a carbon black operating entity in Venezuela, which is accounted for as an equity affiliate, through wholly-owned subsidiaries that carry the investment and receive its dividends. While the operating entity has historically been profitable, it has not been operational in recent periods due to a lack of available raw materials, which is expected to continue for the foreseeable future. As such, in the second quarter of fiscal 2019, the Company performed an impairment analysis and determined that the decrease in fair value of the Venezuelan equity investment is other-than-temporary and that the investment is fully impaired. The Company recorded an impairment charge of $11 million in the second quarter of fiscal 2019, which is included in Other income (expense) within the Consolidated Statement of Operations.

Note N. Employee Benefit Plans

The information below provides detail concerning the Company's benefit obligations under the defined benefit and postretirement benefit plans it sponsors.

Defined benefit plans provide pre-determined benefits to employees that are distributed upon retirement. Cabot is making all sponsor required contributions to these plans. The accumulated benefit obligation was $157 million for the U.S. defined benefit plans and $205 million for the foreign plans as of September 30, 2019 and $143 million for the U.S. defined benefit plans and $349 million for the foreign plans as of September 30, 2018.

In addition to benefits provided under the defined benefit and postretirement benefit plans, the Company provides benefits under defined contribution plans. Cabot recognized expenses related to these plans of $20 million in fiscal 2019, $19 million in fiscal 2018 and $18 million in fiscal 2017.

The following provides information about projected benefit obligations, plan assets, the funded status and weighted-average assumptions of the defined benefit pension and postretirement benefit plans:

	Years Ended September 30							
	2019		2018		2019		2018	
	Pension Benefits				Postretirement Benefits			
	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign
	(In millions)							
Change in Benefit Obligations:								
Benefit obligation at beginning of year	$ 143	$ 373	$ 160	$ 376	$ 29	$ 19	$ 33	$ 20
Service cost	1	7	1	9	—	—	—	—
Interest cost	5	5	5	7	1	1	1	1
Plan participants' contribution	—	1	—	2	—	—	—	—
Foreign currency exchange rate changes	—	(13)	—	(7)	—	(1)	—	(1)
(Gain) Loss from changes in actuarial assumptions and plan experience	21	—	(10)	2	1	2	(2)	—
Benefits paid	(11)	(7)	(7)	(13)	(3)	(1)	(3)	(1)
Settlements or curtailments	(1)	(134)	(5)	(2)	—	—	—	—
Divestiture of Specialty Fluids	—	(13)	—	—	—	—	—	—
Other	(1)	1	(1)	(1)	—	—	—	—
Benefit obligation at end of year	$ 157	$ 220	$ 143	$ 373	$ 28	$ 20	$ 29	$ 19

	Years Ended September 30							
	2019		2018		2019		2018	
	Pension Benefits				Postretirement Benefits			
	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign
	(In millions)							
Change in Plan Assets:								
Fair value of plan assets at beginning of year	$ 149	$ 323	$ 156	$ 318	$ —	$ —	$ —	$ —
Actual return on plan assets	14	17	4	17	—	—	—	—
Employer contribution	1	7	1	9	3	1	3	1
Plan participants' contribution	—	1	—	2	—	—	—	—
Foreign currency exchange rate changes	—	(11)	—	(7)	—	—	—	—
Benefits paid	(11)	(7)	(7)	(13)	(3)	(1)	(3)	(1)
Settlements	(1)	(124)	(4)	(2)	—	—	—	—
Divestiture	—	(10)	—	—	—	—	—	—
Expenses paid from assets	(1)	(1)	(1)	(1)	—	—	—	—
Fair value of plan assets at end of year	$ 151	$ 195	$ 149	$ 323	$ —	$ —	$ —	$ —
Funded status	$ (6)	$ (25)	$ 6	$ (50)	$ (28)	$ (20)	$ (29)	$ (19)
Recognized asset (liability)	$ (6)	$ (25)	$ 6	$ (50)	$ (28)	$ (20)	$ (29)	$ (19)

Pension Assumptions and Strategy

The following assumptions were used to determine the pension benefit obligations and periodic benefit costs as of and for the years ended September 30:

	2019		2018		2017	
	Pension Benefits					
	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign
Actuarial assumptions as of the year-end measurement date:						
Discount rate	2.6%	1.8%	4.2%	2.4%	3.6%	2.4%
Rate of increase in compensation	N/A	3.0%	N/A	2.7%	N/A	2.7%
Actuarial assumptions used to determine net periodic benefit cost during the year:						
Discount rate - benefit obligation	4.2%	2.4%	3.6%	2.4%	3.4%	1.8%
Discount rate - service cost	N/A	2.5%	N/A	2.4%	N/A	1.8%
Discount rate - interest cost	3.9%	2.1%	3.0%	2.0%	2.7%	1.5%
Expected long-term rate of return on plan assets	6.3%	4.9%	6.8%	4.9%	6.8%	4.7%
Rate of increase in compensation	N/A	2.7%	N/A	2.7%	N/A	2.8%

Postretirement Assumptions and Strategy

The following assumptions were used to determine the postretirement benefit obligations and net costs as of and for the years ended September 30:

	2019		2018		2017	
	Postretirement Benefits					
	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign
Actuarial assumptions as of the year-end measurement date:						
Discount rate	2.9%	2.4%	4.1%	3.2%	3.4%	3.1%
Initial health care cost trend rate	6.5%	6.9%	7.0%	7.0%	7.0%	7.1%
Actuarial assumptions used to determine net cost during the year:						
Discount rate - benefit obligation	4.1%	3.2%	3.4%	3.1%	3.0%	2.8%
Discount rate - service cost	4.0%	3.5%	3.1%	3.6%	2.6%	3.2%
Discount rate - interest cost	3.7%	3.1%	2.8%	3.0%	2.4%	2.6%
Initial health care cost trend rate	7.0%	7.0%	7.0%	7.1%	7.0%	6.1%

Cabot uses discount rates as of September 30, the plans' measurement date, to determine future benefit obligations under its U.S. and foreign defined benefit plans. The discount rates for the defined benefit plans in Canada, the Eurozone, Japan, Mexico, Switzerland, the United Arab Emirates, the United Kingdom and the U.S. are derived from yield curves that reflect high quality corporate bond yield or swap rate information in each region and reflect the characteristics of Cabot's employee benefit plans. The discount rates for the defined benefit plans in the Czech Republic and Indonesia are based on government bond indices that best reflect the durations of the plans, adjusted for credit spreads presented in selected AA corporate bond indices. The rates utilized are selected because they represent long-term, high quality, fixed income benchmarks that approximate the long-term nature of Cabot's pension obligations and related payouts.

Amounts recognized in the Consolidated Balance Sheets at September 30, 2019 and 2018 related to the Company's defined benefit pension and postretirement benefit plans were as follows:

	September 30							
	2019		2018		2019		2018	
	Pension Benefits				Postretirement Benefits			
	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign
	(In millions)							
Noncurrent assets	$ —	$ 19	$ 10	$ 21	$ —	$ —	$ —	$ —
Current liabilities	$ (3)	$ (1)	$ —	$ (1)	$ (3)	$ —	$ (3)	$ (1)
Noncurrent liabilities	$ (3)	$ (43)	$ (4)	$ (70)	$ (25)	$ (20)	$ (26)	$ (18)

Amounts recognized in AOCI at September 30, 2019 and 2018 related to the Company's defined benefit pension and postretirement benefit plans were as follows:

	September 30							
	2019		2018		2019		2018	
	Pension Benefits				Postretirement Benefits			
	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign
	(In millions)							
Net actuarial (gain) loss	$ 13	$ 36	$ (1)	$ 49	$ (6)	$ 6	$ (7)	$ 4
Net prior service credit	—	—	—	(1)	—	—	(2)	—
Balance in accumulated other comprehensive income (loss), pretax	$ 13	$ 36	$ (1)	$ 48	$ (6)	$ 6	$ (9)	$ 4

In fiscal 2020, the Company expects an estimated net loss of $3 million will be amortized from AOCI to net periodic benefit cost. In addition, the Company expects no prior service credits for other postretirement benefits will be amortized from AOCI to net periodic benefit costs in fiscal 2020.

Estimated Future Benefit Payments

The Company expects that the following benefit payments will be made to plan participants in the years from 2020 to 2029:

Years Ending September 30	Pension Benefits U.S.	Pension Benefits Foreign	Postretirement Benefits U.S.	Postretirement Benefits Foreign
	(In millions)			
2020[(1)]	$ 158	$ 9	$ 3	$ 1
2021	$ —	$ 12	$ 3	$ 1
2022	$ —	$ 10	$ 3	$ 1
2023	$ —	$ 10	$ 3	$ 1
2024	$ —	$ 11	$ 3	$ 1
2025 - 2029	$ 1	$ 55	$ 10	$ 4

(1) The $158 million expected payment for U.S. pension benefits in fiscal 2020 is in connection with the termination of the U.S. plan which is expected to be completed in fiscal 2020.

Postretirement medical benefits are unfunded and impact Cabot's cash flows as benefits become due, which is expected to be $4 million in fiscal 2020. The Company expects to contribute $10 million to its pension plans in fiscal 2020.

Net periodic defined benefit pension and other postretirement benefit costs include the following components:

	Years Ended September 30											
	2019		2018		2017		2019		2018		2017	
	Pension Benefits						Postretirement Benefits					
	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign
	(In millions)											
Service cost	$ 1	$ 7	$ 1	$ 9	$ 1	$ 10	$ —	$ —	$ —	$ —	$ —	$ —
Interest cost	5	5	5	7	4	6	1	1	1	1	1	1
Expected return on plan assets	(9)	(10)	(10)	(15)	(9)	(14)	—	—	—	—	—	—
Amortization of prior service cost	—	2	—	—	—	—	(2)	—	(3)	—	(3)	—
Net losses	—	2	—	3	—	5	(1)	—	(1)	—	—	—
Settlements or Curtailments cost	—	(7)	—	—	—	—	—	—	—	—	—	—
Net periodic (benefit) cost	$ (3)	$ (1)	$ (4)	$ 4	$ (4)	$ 7	$ (2)	$ 1	$ (3)	$ 1	$ (2)	$ 1

Other changes in plan assets and benefit obligations recognized in Other comprehensive income (loss) are as follows:

	Years Ended September 30											
	2019		2018		2017		2019		2018		2017	
	Pension Benefits						Postretirement Benefits					
	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign	U.S.	Foreign
	(In millions)											
Net (gains) losses	$ 14	$ (16)	$ (4)	$ —	$ (9)	$ (35)	$ —	$ 2	$ (2)	$ (1)	$ (3)	$ (1)
Prior service (credit) cost	—	3	—	—	—	—	—	—	—	—	—	—
Amortization of prior service credit	—	(2)	—	—	—	—	2	—	3	—	3	—
Amortization of prior unrecognized loss	—	(2)	—	(3)	—	(5)	1	—	1	—	—	—
Loss on divestiture	—	(2)	—	—	—	—	—	—	—	—	—	—
Gain on settlements	—	7	—	—	—	—	—	—	—	—	—	—
Other	—	—	—	—	—	—	—	—	—	—	—	—
Net changes recognized in Total other comprehensive (income) loss [(1)]	$ 14	$ (12)	$ (4)	$ (3)	$ (9)	$ (40)	$ 3	$ 2	$ 2	$ (1)	$ —	$ (1)

(1) The tax impact on pension and other postretirement benefit liability adjustments arising during the period was a tax benefit of $5 million, tax provision of $1 million, and tax provision of $7 million for fiscal years 2019, 2018, and 2017, respectively.

In the third quarter of fiscal 2019, the Company adjusted the assumptions in its U.K. plan to calculate accrued benefits for a portion of the plan's participants. As a result of this change, a prior service cost of $2 million was recorded in Other income (expense) in the Consolidated Statement of Operations.

Curtailments and Settlements of Employee Benefit Plans

In fiscal 2019, the Company transferred the defined benefit obligations and pension plan assets in one of its foreign defined benefit plans to a multi-employer plan. This action moved the administrative, asset custodial, asset investment, actuarial, communication and benefit payment obligations to the multi-employer fund administrator. As a result of the transfer, there was a $30 million reduction in net pension obligations associated with the plan, and a pre-tax gain of $7 million was recorded in Other income (expense) in the Consolidated Statement of Operations. In addition, as part of the transfer the Company recorded a $3 million charge in fiscal 2019 for the Company's agreement to fund the actuarial loss gap between the terminated plan and the multi-employer plan, which will be paid over the next five years. This charge is included Other income (expense) in the Consolidated Statement of Operations and the liability is included in Accounts payable and accrued liabilities and Other liabilities on the Consolidated Balance Sheet.

The Company recognized net losses of less than $1 million in fiscal 2018 and 2017 due to curtailments and settlements of certain employee benefit plans.

U.S. Plan Termination

In fiscal 2019, the Company's Board of Directors approved a resolution to terminate the U.S. pension plan. The Company commenced the U.S. plan termination process during the third quarter of 2019 and expects to complete the transfer of the U.S. plan's assets in fiscal year 2020 pending an Internal Revenue Service ("IRS") determination letter. The pension liability will be settled in either a lump-sum payment or a purchased annuity. Upon settlement of the plan, the Company will recognize a loss associated with the release of approximately $13 million from Accumulated other comprehensive income (loss) in the Consolidated Balance Sheet to Other income (expense) in the Consolidated Statement of Operations.

Sensitivity Analysis

Measurement of postretirement benefit expense is based on actuarial assumptions used to value the postretirement benefit liability at the beginning of the year. Assumed health care cost trend rates have an effect on the amounts reported for the health care plans. The fiscal 2019 weighted-average assumed health care cost trend rate is 6.5% for U.S. plans and 6.9 % for foreign plans. A one percentage point change in the 2019 assumed health care cost trend rate would have an immaterial impact to the aggregate of the service and interest cost components of the net periodic postretirement benefit and would have a less than $1 million impact to U.S. plans and $3 million impact to foreign plans postretirement benefit obligation.

Plan Assets

The Company's defined benefit pension plans weighted-average asset allocations at September 30, 2019 and 2018 by asset category, are as follows:

	September 30			
	2019		2018	
	Pension Assets			
	U.S.	Foreign	U.S.	Foreign
Equity securities	—%	39%	40%	39%
Debt securities	68%	50%	60%	53%
Cash and other securities	32%	11%	—%	8%
Total	100%	100%	100%	100%

To develop the expected long-term rate of return on plan assets assumption, the Company used a capital asset pricing model. The model considers the current level of expected returns on risk-free investments comprised of government bonds, the historical level of the risk premium associated with the other asset classes in which the portfolio is invested, and the expectations for future returns for each asset class. The expected return for each asset class was then weighted based on the target asset allocation to develop the expected long-term rate of return for each plan.

Cabot's investment strategy for each of its defined benefit plans in the U.S. and abroad is generally based on a set of investment objectives and policies that cover time horizons and risk tolerance levels consistent with plan liabilities. Periodic studies are performed to determine the asset mix that will meet pension obligations at a reasonable cost to the Company. The assets of the defined benefit plans are comprised principally of investments in equity and high quality fixed income securities, which are broadly diversified across the capitalization and style spectrum and are managed using both active and passive strategies. The weighted average target asset allocation for the U.S. plans is 32% in cash equivalents and 68% in fixed income and for the foreign plans is 41%

in equity, 49% in fixed income, 6% in real estate and 4% in cash and other securities. The target allocation of the U.S. Pension plan has changed as a result of the anticipated plan settlement discussed in the U.S. Plan Termination section above.

For pension plan assets classified as Level 1 measurements (measured using quoted prices in active markets), total fair value is either the price of the most recent trade at the time of the market close or the official close price, as defined by the exchange on which the asset is most actively traded on the last trading day of the period, multiplied by the number of units held without consideration of transaction costs.

For pension plan assets classified as Level 2 measurements, where the security is frequently traded in less active markets, fair value is based on the closing price at the end of the period; where the security is less frequently traded, fair value is based on the price a dealer would pay for the security or similar securities, adjusted for any terms specific to that asset or liability. Market inputs are obtained from well-established and recognized vendors of market data and subjected to tolerance/quality checks.

The fair value of the Company's pension plan assets at September 30, 2019 and 2018 by asset category is as follows:

	September 30					
	2019			2018		
	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Observable Inputs (Level 2)	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Observable Inputs (Level 2)	Total
	(In millions)					
Cash	$ 2	$ —	$ 2	$ 3	$ —	$ 3
Direct investments:						
U.S government bonds	—	—	—	17	13	30
U.S. corporate bonds	—	—	—	—	74	74
Non-U.S. equities	3	—	3	—	—	—
Non-U.S. government bonds	2	—	2	—	—	—
Non-U.S. corporate bonds	3	—	3	—	—	—
Mortgage backed securities	—	1	1	—	—	—
Other fixed income	1	—	1	—	—	—
Total direct investments	9	1	10	17	87	104
Investment funds:						
Equity funds[1]	—	74	74	44	126	170
Fixed income funds[2]	104	90	194	—	169	169
Real estate funds[3]	—	12	12	—	9	9
Cash equivalent funds	48	—	48	1	—	1
Total investment funds	152	176	328	45	304	349
Alternative investments:						
Insurance contracts[4]	—	5	5	—	16	16
Other alternative investments	1	—	1	—	—	—
Total alternative investments	1	5	6	—	16	16
Total pension plan assets	$ 164	$ 182	$ 346	$ 65	$ 407	$ 472

(1) The equity funds asset class includes funds that invest in U.S. equities as well as equity securities issued by companies incorporated, listed or domiciled in countries in developed and/or emerging markets. These companies may be in the small-, mid- or large-cap categories.

(2) The fixed income funds asset class includes investments in high quality funds. High quality fixed income funds primarily invest in low risk U.S. and non-U.S. government securities, investment-grade corporate bonds, mortgages and asset-backed securities. A significant portion of the fixed income funds include investment in long-term bond funds.

(3) The real estate funds asset class includes funds that primarily invest in entities which are principally engaged in the ownership, acquisition, development, financing, sale and/or management of income-producing real estate properties, both commercial and residential. These funds typically seek long-term growth of capital and current income that is above average relative to public equity funds.

(4) Insurance contracts held by the Company's non-U.S. plans are issued by well-known, highly rated insurance companies.

Note O. Stock-Based Compensation

The Company has established equity compensation plans that provide stock-based compensation to eligible employees. The 2009 Long-Term Incentive Plan (the "2009 Plan") authorized the issuance of up to 8,854,000 shares of common stock. The 2017 Long-Term Incentive Plan (the "2017 Plan") was approved by Cabot's stockholders on March 9, 2017 and authorizes the issuance of up to 5,375,000 shares of common stock. The Company ceased granting awards under the 2009 Plan when the 2017 Plan was approved and, accordingly, the 2017 Plan is the only equity incentive plan under which the Company may grant equity awards to employees.

The terms of awards made under Cabot's equity compensation plans are generally determined by the Compensation Committee of Cabot's Board of Directors. The awards made in fiscal 2019, 2018 and 2017 consist of grants of stock options, time-based restricted stock units, and performance-based restricted stock units. The options were issued with an exercise price equal to 100% of the market price of Cabot's common stock on the date of grant, generally vest over a three year period (30% on each of the first and second anniversaries of the date of grant and 40% on the third anniversary of the date of grant) and have a ten-year term. The restricted stock units generally vest three years from the date of the grant. The number of shares issuable, if any, when a performance-based restricted stock unit award vests will depend on the degree of achievement of the corporate performance metrics for each year within the three-year performance period of the award. Accordingly, future compensation costs associated with outstanding awards of performance-based restricted stock units may increase or decrease based on the probability of the Company achieving the performance metrics.

Stock-based employee compensation expense was $8 million, $16 million and $10 million, after tax, for fiscal 2019, 2018 and 2017, respectively.

The Company recognized the full impact of its stock-based employee compensation expense in the Consolidated Statements of Operations for fiscal 2019, 2018 and 2017 and did not capitalize any such costs on the Consolidated Balance Sheets because those that qualified for capitalization were not material. The following table presents stock-based compensation expenses included in the Company's Consolidated Statements of Operations:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Cost of sales	$ 1	$ 2	$ 1
Selling and administrative expenses	9	19	14
Research and technical expenses	1	1	1
Stock-based compensation expense	11	22	16
Income tax benefit	(3)	(6)	(6)
Net stock-based compensation expense	$ 8	$ 16	$ 10

As of September 30, 2019, Cabot has $16 million and $2 million of total unrecognized compensation cost related to restricted stock units and options, respectively, granted under the Company's equity incentive plans. These costs are expected to be recognized over a weighted-average period of approximately one year for restricted stock units and options.

Equity Incentive Plan Activity

The following table summarizes the total stock option and restricted stock unit activity in the equity incentive plans for fiscal 2019:

	Stock Options			Restricted Stock Units	
	Total Options [4]	Weighted Average Exercise Price	Weighted Average Grant Date Fair Value	Restricted Stock Units[1]	Weighted Average Grant Date Fair Value
			(Shares in thousands)		
Outstanding at September 30, 2018	881	$ 50.73	$ 13.82	985	$ 50.16
Granted	343	$ 49.70	$ 10.85	316	$ 49.44
Performance-based adjustment[2]	—	$ —	$ —	10	$ 62.98
Exercised / Vested	(49)	$ 35.06	$ 9.41	(383)	$ 40.97
Cancelled / Forfeited	(153)	$ 54.44	$ 10.36	(163)	$ 54.48
Outstanding at September 30, 2019[3]	1,022	$ 50.57	$ 12.13	765	$ 53.71
Exercisable at September 30, 2019	499	$ 48.09			

(1) The number granted represents the number of shares issuable upon vesting of time-based restricted stock units and performance-based restricted stock units, assuming the Company performs at the target performance level in each year of the three-year performance period.

(2) Represents the net incremental number of shares issuable upon vesting of performance-based restricted stock units based upon the achievement of the annual financial performance metrics for fiscal 2019.

(3) Stock options outstanding include options vested and expected to vest in the future and have a weighted average remaining contractual life of 6.74 years.

(4) Unvested stock options were approximately 523,000 and 546,000 at September 30, 2019 and 2018 and their weighted average grant date fair values were $52.95 and $54.48, respectively.

Stock Options

The aggregate intrinsic value for all options outstanding and options exercisable was nil since the Company's closing stock price of $45.32 at September 30, 2019 was below their weighted average exercise price. The intrinsic value of options exercised during fiscal 2019, 2018 and 2017 was $1 million, $11 million and $16 million, respectively, and the Company received cash of $2 million, $22 million and $21 million, respectively, from these exercises. In fiscal 2019 and 2018, the Company recognized an immaterial tax expense and a $1 million tax benefit, respectively, from the exercise of stock options, which is included in (Provision) benefit for income taxes within the Consolidated Statement of Operations. Prior to the Company's adoption of the new accounting standard for stock compensation in fiscal 2018, tax benefits associated with stock option exercises were included in APIC.

The Company uses the Black-Scholes option-pricing model to estimate the fair value of the options at the grant date. The weighted average grant date fair values of options granted during fiscal 2019, 2018 and 2017 was $10.85, $15.21, and $12.76 per option, respectively. The fair values on the grant date were calculated using the following weighted-average assumptions:

	Years Ended September 30		
	2019	2018	2017
Expected stock price volatility	27%	28%	32%
Risk free interest rate	3.1%	2.2%	1.8%
Expected life of options (years)	6	6	6
Expected annual dividends per year	$ 1.32	$ 1.26	$ 1.20

The expected stock price volatility assumption was determined using the historical volatility of the Company's common stock over the expected life of the option. The expected term reflects the anticipated time period between the measurement date and the exercise date or post-vesting cancellation date.

Restricted Stock Units

The value of restricted stock unit awards is the closing stock price at the date of the grant. The weighted average grant date fair values of restricted stock unit awards granted during fiscal 2019, 2018 and 2017 was $49.44, $62.18, and $51.03, respectively. The intrinsic value of restricted stock units (meaning the fair value of the units on the date of vesting) that vested during fiscal 2019, 2018 and 2017 was $18 million, $12 million and $7 million, respectively.

Supplemental 401(k) Plan

Cabot's Deferred Compensation and Supplemental Retirement Plan ("SERP 401(k)") provides benefits to highly compensated employees when the retirement plan limits established under the Internal Revenue Code prevent them from receiving all of the Company matching and retirement contributions that would otherwise be provided under the qualified 401(k) plan. The SERP 401(k) is non-qualified and unfunded. Contributions under the SERP 401(k) are treated as if invested in Cabot common stock. The majority of the distributions made under the SERP 401(k) are required to be paid with shares of Cabot common stock. The remaining distributions, which relate to certain grandfathered accounts, will be paid in cash based on the market price of Cabot common stock at the time of distribution. The aggregate value of the accounts that will be paid out in stock, which is equivalent to approximately 93,000 and 116,000 shares of Cabot common stock as of September 30, 2019 and 2018, respectively, is reflected at historic cost in stockholders' equity, and the aggregate value of the accounts that will be paid in cash, which is $1 million as of both September 30, 2019 and 2018, is reflected in other long-term liabilities and marked-to-market quarterly.

Note P. Restructuring

Cabot's restructuring activities were recorded in the Consolidated Statements of Operations as follows:

	Years Ended September 30		
	2019	2018	2017
	(In millions)		
Cost of sales	$ 9	$ (31)	$ 2
Selling and administrative expenses	7	1	1
Total	$ 16	$ (30)	$ 3

Details of all restructuring activities and the related reserves for fiscal 2017, 2018, and 2019 were as follows:

	Severance and Employee Benefits	Environmental Remediation and Decommissioning Activities	Non-Cash Asset Impairment and Accelerated Depreciation	Asset Sales	Other	Total
	(In millions)					
Reserve at September 30, 2016	$ 3	$ 2	$ —	$ —	$ —	$ 5
Charges (gain)	1	1	—	—	1	3
Costs charged against assets	—	—	—	—	1	1
Cash (paid) received	(3)	(1)	—	—	(2)	(6)
Reserve at September 30, 2017	1	2	—	—	—	3
Charges (gain)	2	3	1	(38)	2	(30)
Costs charged against liabilities	—	—	(1)	(1)	—	(2)
Cash paid	(2)	(1)	—	39	(2)	34
Reserve at September 30, 2018	1	4	—	—	—	5
Charges (gain)	11	—	2	—	3	16
Costs charged against assets	—	—	(2)	—	—	(2)
Cash (paid) received	(9)	—	—	—	(3)	(12)
Reserve at September 30, 2019	$ 3	$ 4	$ —	$ —	$ —	$ 7

Cabot's severance and employee benefit reserves and other closure related reserves are reflected in Accounts payable and accrued liabilities on the Company's Consolidated Balance Sheets. Cabot's environmental remediation reserves related to restructuring activities are reflected in Other liabilities on the Company's Consolidated Balance Sheets.

Purification Solutions Transformation Plan

In December 2018, the Company began implementation of a transformation plan to improve the long-term performance of the Purification Solutions segment. The purpose of the plan is to focus the business's product portfolio, optimize its manufacturing assets, and streamline its organizational structure to support the new focus. The Company recorded charges of approximately $9 million related to this plan in the year ended September 30, 2019, comprised of approximately $8 million of severance costs and $1 million of professional fees and other charges. The Company expects to record cash charges of approximately $1 million in fiscal 2020 for additional restructuring charges related to this plan. Cabot paid approximately $8 million related to these activities in the year ended September 30, 2019, and expects to pay approximately $2 million in fiscal 2020. As of September 30, 2019, Cabot had $1 million of accrued severance charges in the Consolidated Balance Sheets related to these actions.

Sale of Land Rights in Thane, India

During fiscal 2018, Cabot entered into a binding memorandum of understanding to sell its land rights in Thane, India for approximately $28 million. The Company received a deposit of $3 million in cash in the first quarter of fiscal 2016, an additional deposit of $3 million in cash in the third quarter of fiscal 2018, and the final balance of $22 million was received on September 14, 2018. Based on the execution of the binding agreement and non-refundable receipt of cash, the Company has recorded the pre-tax gain on sale of $28 million to Cost of sales in the Consolidated Statements of Operations in the year ended September 30, 2018.

2016 Plan

As part the Company's 2016 restructuring plan, the Company ceased operations at its carbon black manufacturing facility in Merak, Indonesia in January 2016 and completed the sale of the land on which the facility was located in the second quarter of fiscal 2018 for cash consideration totaling approximately $13 million, resulting in a net pre-tax gain of approximately $11 million recorded to Cost of sales in the Company's Consolidated Statements of Operations.

Note Q. Accumulated Other Comprehensive Income (Loss)

Changes in each component of AOCI, net of tax, are as follows for fiscal 2018 and 2019:

	Currency Translation Adjustment	Unrealized Gains on Investment	Pension and Other Postretirement Benefit Liability Adjustment	Total
		(In millions)		
Balance at September 30, 2017 attributable to Cabot Corporation	$ (204)	$ 2	$ (57)	$ (259)
Other comprehensive income (loss) before reclassifications	(64)	(1)	6	(59)
Amounts reclassified from AOCI	(2)	—	(1)	(3)
Less: Other comprehensive income (loss) attributable to noncontrolling interests	(4)	—	—	(4)
Balance at September 30, 2018 attributable to Cabot Corporation	(266)	1	(52)	(317)
Other comprehensive income (loss) before reclassifications	(69)	—	4	(65)
Amounts reclassified from AOCI	(9)	—	(6)	(15)
Less: Other comprehensive income (loss) attributable to noncontrolling interests	(6)	—	—	(6)
Balance at September 30, 2019 attributable to Cabot Corporation	$ (338)	$ 1	$ (54)	$ (391)

The amounts reclassified out of AOCI and into the Consolidated Statements of Operations for the fiscal years ended September 30, 2019, 2018 and 2017 are as follows:

	Affected Line Item in the Consolidated Statements of Operations	Years Ended September 30		
		2019	2018	2017
			(In Millions)	
Derivatives: net investment hedges				
(Gains) losses reclassified to interest expense	Interest expense	$ (5)	$ (5)	$ —
(Gains) losses excluded from effectiveness testing and amortized to interest expense	Interest expense	1	2	—
Pension and other postretirement benefit liability adjustment				
Amortization of actuarial losses	Net Periodic Benefit Cost - see Note N for details	1	2	5
Amortization of prior service cost (credit)	Net Periodic Benefit Cost - see Note N for details	—	(3)	(3)
Settlement and curtailment gain	Net Periodic Benefit Cost - see Note N for details	(7)	—	—
Specialty Fluids divestiture	Specialty Fluids loss on sale and asset impairment - see Note D for details	(3)	—	—
Total before tax		(13)	(4)	2
Tax impact	Provision (benefit) for income taxes	(2)	1	—
Total after tax		$ (15)	$ (3)	$ 2

Note R. Earnings Per Share

The following tables summarize the components of the basic and diluted earnings per common share ("EPS") computations:

	Years Ended September 30		
	2019	2018	2017
	(In millions, except per share amounts)		
Basic EPS:			
Net income (loss) attributable to Cabot Corporation	$ 157	$ (113)	$ 248
Less: Dividends and dividend equivalents to participating securities	1	1	—
Less: Undistributed earnings allocated to participating securities[1]	1	—	2
Earnings (loss) allocated to common shareholders (numerator)	$ 155	$ (114)	$ 246
Weighted average common shares and participating securities outstanding	59.5	62.4	62.8
Less: Participating securities[1]	0.8	0.7	0.5
Adjusted weighted average common shares (denominator)	58.7	61.7	62.3
Per share amounts—basic:			
Net income (loss) attributable to Cabot Corporation	$ 2.64	$ (1.85)	$ 3.94
Diluted EPS:			
Earnings (loss) allocated to common shareholders	$ 155	$ (114)	$ 246
Plus: Earnings (loss) allocated to participating securities	2	—	2
Less: Adjusted earnings allocated to participating securities[2]	2	—	2
Earnings (loss) available to common shares (numerator)	$ 155	$ (114)	$ 246
Adjusted weighted average common shares outstanding	58.7	61.7	62.3
Effect of dilutive securities:			
Common shares issuable[3]	0.1	—	0.4
Adjusted weighted average common shares (denominator)	58.8	61.7	62.7
Per share amounts—diluted:			
Net income (loss) attributable to Cabot Corporation	$ 2.63	$ (1.85)	$ 3.91

(1) Participating securities consist of shares underlying outstanding and achieved performance-based restricted stock units issued during and after fiscal 2017 and all unvested time-based restricted stock units. The holders of these units are entitled to receive dividend equivalents payable in cash to the extent dividends are paid on the Company's outstanding common stock and equal in value to the dividends that would have been paid in respect of the shares underlying such units.

Undistributed earnings are the earnings which remain after dividends declared during the period are assumed to be distributed to the common and participating shareholders. Undistributed earnings are allocated to common and participating shareholders on the same basis as dividend distributions. The calculation of undistributed earnings is as follows:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Calculation of undistributed earnings:			
Net income (loss) attributable to Cabot Corporation	$ 157	$ (113)	$ 248
Less: Dividends declared on common stock	80	79	77
Less: Dividends and dividend equivalents to participating securities	1	1	—
Undistributed earnings (loss)	$ 76	$ (193)	$ 171
Allocation of undistributed earnings:			
Undistributed earnings (loss) allocated to common shareholders	$ 75	$ (193)	$ 169
Undistributed earnings allocated to participating securities	1	—	2
Undistributed earnings (loss)	$ 76	$ (193)	$ 171

(2) Undistributed earnings (loss) are adjusted for the assumed distribution of dividends to the dilutive securities, which are described in (3) below, and then reallocated to participating securities.

(3) Represents incremental shares of common stock from the (i) assumed exercise of stock options issued under Cabot's equity incentive plans; (ii) assumed issuance of shares to employees pursuant to the Company's SERP 401(k) Plan; and (iii) assumed issuance of shares for outstanding and achieved performance-based stock unit awards issued before fiscal 2017 under Cabot's equity incentive plans using the treasury stock method. For fiscal 2019, 2018 and 2017, respectively, 942,060, 229,220 and 179,052 incremental shares of common stock were not included in the calculation of diluted earnings per share because the inclusion of these shares would have been antidilutive.

Note S. Income Taxes

Income from continuing operations before income taxes and equity in net earnings of affiliated companies was as follows:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Domestic	$ (66)	$ (229)	$ (8)
Foreign	321	346	307
Income from continuing operations before income taxes and equity in earnings of affiliated companies	$ 255	$ 117	$ 299

Tax provision (benefit) for income taxes consisted of the following:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
U.S. federal and state:			
Current	$ 2	$ 14	$ 5
Deferred	(30)	114	(26)
Total	(28)	128	(21)
Foreign:			
Current	95	88	59
Deferred	3	(23)	(5)
Total	98	65	54
Provision (benefit) for income taxes	$ 70	$ 193	$ 33

The provision (benefit) for income taxes differed from the provision for income taxes as calculated using the U.S. statutory rate as follows:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Computed tax expense at the federal statutory rate	$ 53	$ 29	$ 105
Foreign income:			
Impact of taxation at different rates, repatriation, losses and other	42	6	(75)
Impact of increase (decrease) in valuation allowance on deferred taxes	(25)	(16)	(7)
Impact of foreign losses for which a current tax benefit is not available	—	—	1
Impact of non-deductible net currency losses	—	2	—
Impact of the Tax Cuts and Jobs Act of 2017	—	159	—
Global Intangible Low Taxed Income (GILTI)	10	—	—
U.S. and state benefits from research and experimentation activities	(2)	(2)	(2)
Provision (settlement) of unrecognized tax benefits	(8)	1	7
Impact of goodwill impairment charge	—	18	—
Permanent differences, net	1	(1)	5
State taxes, net of federal effect	(1)	(3)	(1)
Provision (benefit) for income taxes	$ 70	$ 193	$ 33

In the fiscal 2019 tax provision, Cabot recorded $7 million of net discrete tax benefit composed of tax benefits of $4 million related to uncertain tax positions, $2 million related to a pension settlement, $2 million related to changes in valuation allowance on beginning of year tax balances, $2 million related to the Specialty Fluids sale, $1 million related to result of changes in non-US tax laws and $1 million related to other miscellaneous tax items, partially offset by net tax charges of $5 million related to various return to provision adjustments related to tax return filings and audit settlements.

In the fiscal 2018 tax provision, Cabot recorded $120 million of net discrete tax expense, composed of $159 million net tax impact of the Act and $3 million tax expense upon the sale of assets, offset by net tax benefits of $29 million related to impairment and $15 million from a change in valuation allowance on a beginning of year tax balance, and net tax charge of $2 million related to other miscellaneous tax items.

In the fiscal 2017 tax provision, Cabot recorded $25 million of net discrete tax benefits, composed of net tax benefits of $16 million associated with the generation of excess foreign tax credits upon repatriation of previously taxed foreign earnings and the accrual of U.S. tax on certain foreign earnings, a net tax benefit of $6 million from a change in valuation allowance on a beginning of year tax balance, net tax benefits of $4 million for various return to provision adjustments related to tax return filings and net tax charges of $1 million related to other miscellaneous tax items.

Tax Reform

On December 22, 2017, the U.S. enacted significant changes to federal income tax law affecting the Company, including a permanent reduction of the U.S. corporate income tax rate from 35% to 21%, effective January 1, 2018, as well as a 100% dividend received deduction for foreign dividends. Although the passage of the Act reduced the U.S. tax rate and effectively created a participation exemption regime for foreign earnings, there are certain other aspects of the new legislation that affect the Company, including in particular, immediate U.S. taxation of global intangible low-taxed income (“GILTI”) earned by foreign subsidiaries. GILTI earned by Controlled Foreign Corporations (“CFCs”) must be included currently in the gross income of the CFCs’ U.S. shareholder. GILTI is the excess of the shareholder’s “net CFC-tested income” over the net deemed tangible income return, which is currently defined as the excess of (1) 10% of the aggregate of the U.S. shareholder’s pro rata share of the qualified business asset investment of each CFC with respect to which it is a U.S. shareholder over (2) the amount of certain interest expense taken into account in the determination of net CFC-tested income. GILTI had a negative impact on earnings of $10 million and this is the primary driver of the increase in the Company’s effective tax rate. In transitioning to this participation exemption regime, the Company was also subject, during fiscal 2018, to a one-time tax on the deemed repatriation of certain foreign earnings. The Company did not incur a Base Erosion Anti-Abuse Tax (“BEAT”) liability in fiscal 2019 since it did not exceed the base erosion percentage of 3% for the taxable year. A significant portion of the Company’s intercompany payments were exempted from BEAT. The Company will continue to analyze the applicability of the BEAT provisions on a quarterly basis.

In January 2018, accounting guidance was issued requiring a company to make an accounting policy to either treat taxes due on future U.S. inclusions in taxable income related to GILTI as a current-period expense when incurred (the "period cost method") or factor such amounts into a company's measurement of its deferred taxes (the "deferred method"). The Company has elected the period cost method and has considered the estimated 2019 GILTI impact in its 2019 tax expense.

Significant components of deferred income taxes were as follows:

	September 30 2019	September 30 2018
	(In millions)	
Deferred tax assets:		
Deferred expenses	$ 15	$ 17
Intangible assets	28	23
Inventory	9	4
Other	3	4
Pension and other benefits	41	45
Net operating loss carryforwards	124	146
Foreign tax credit carryforwards	20	12
R&D credit carryforwards	43	41
Other business credit carryforwards	29	39
Subtotal	312	331
Valuation allowance	(124)	(169)
Total deferred tax assets	$ 188	$ 162

	September 30 2019	September 30 2018
	(In millions)	
Deferred tax liabilities:		
Property, plant and equipment	$ (61)	$ (56)
Unremitted earnings of non-U.S. subsidiaries	(5)	(14)
Total deferred tax liabilities	$ (66)	$ (70)

Approximately $711 million of net operating loss carryforwards ("NOLs") and $99 million of other tax credit carryforwards remain at September 30, 2019. The benefits of these carryforwards are dependent upon taxable income during the carryforward period in the jurisdictions in which they arose. Accordingly, a valuation allowance has been provided where management has determined that it is more likely than not that the carryforwards will not be utilized. The following table provides detail surrounding the expiration dates of these carryforwards:

Years Ending September 30	NOLs	Credits
	(In millions)	
2020 - 2026	$ 262	$ 40
2027 and thereafter	168	57
Indefinite carryforwards	281	2
Total	$ 711	$ 99

As of September 30, 2019, provisions have not been made for non-U.S. withholding taxes or other applicable taxes on approximately $1,316 million of undistributed earnings of non-U.S. subsidiaries, as these earnings are considered indefinitely reinvested. Cabot continually reviews the financial position and forecasted cash flows of its U.S. consolidated group and foreign subsidiaries in order to reaffirm the Company's intent and ability to continue to indefinitely reinvest earnings of its foreign subsidiaries or whether such earnings will need to be repatriated in the foreseeable future. Such review encompasses operational needs and future capital investments. From time to time, however, the Company's intentions relative to specific indefinitely reinvested amounts change because of certain unique circumstances. These earnings could become subject to non-U.S. withholding taxes and other applicable taxes if they were remitted to the U.S.

As of September 30, 2019, the Company had U.S. net deferred tax assets of $127 million, including $20 million of foreign tax credit carryforwards. Management believes that the Company's history of generating domestic profits, defined as U.S. income from continuing operations adjusted for U.S. permanent differences, provides adequate evidence that it is more likely than not that all of the U.S. net deferred tax assets will be realized in the normal course of business. Realization of deferred tax assets is dependent upon future taxable income generated over an extended period of time.

As of September 30, 2019, the Company needs to generate approximately $606 million in cumulative future U.S. taxable income at various times over approximately 20 years to realize all of its net U.S. deferred tax assets. The Company reviews its forecast in relation to actual results and expected trends on a quarterly basis. Failure to achieve operating income targets may change the Company's assessment regarding the realization of Cabot's deferred tax assets and such change could result in a valuation allowance being recorded against some or all of the Company's deferred tax assets. Any increase in a valuation allowance would result in additional income tax expense, lower stockholders' equity and could have a significant impact on Cabot's earnings in future periods.

The valuation allowances at September 30, 2019 and 2018 represent management's best estimate of the non-realizable portion of the deferred tax assets. The valuation allowance decreased by $45 million in fiscal 2019 primarily due to the release of valuation allowance from the expiration of net operating losses in certain jurisdictions and the divestiture of the Company's Specialty Fluids business of $16 million. The valuation allowance increased by $1 million in fiscal 2018 due to net reductions in value of certain pre-existing and acquired future tax benefits and net operating losses generated that are included in deferred tax assets.

Cabot has filed its tax returns in accordance with the tax laws in each jurisdiction and recognizes tax benefits for uncertain tax positions when the position would more likely than not be sustained based on its technical merits and recognizes measurement adjustments when needed. As of September 30, 2019, the total amount of unrecognized tax benefits was $27 million, of which $17 million was recorded in the Company's Consolidated Balance Sheets and $10 million of deferred tax assets, principally related to state net operating loss carryforwards, have not been recorded. In addition, accruals of less than $1 million and $7 million have been recorded for penalties and interest, respectively, as of September 30, 2019, and $1 million and $9 million, respectively, as of September 30, 2018. Total penalties and interest recorded in the tax provision in the Consolidated Statements of Operations was $2 million in each of the years ended September 30, 2019, 2018 and 2017. If the unrecognized tax benefits were recognized at a given point in time, there would be approximately $27 million favorable impact on the Company's tax provision before consideration of the impact of the potential need for valuation allowances.

A reconciliation of the beginning and ending amount of unrecognized tax benefits for fiscal years 2019, 2018 and 2017 is as follows:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Balance at beginning of the year	$ 37	$ 36	$ 30
Additions based on tax provisions related to the current year	—	2	2
Additions for tax positions of prior years	—	1	8
Reductions of tax provisions of prior years	(1)	—	(1)
Reductions related to settlements	(5)	—	(2)
Reductions from lapse of statute of limitations	(4)	(2)	(1)
Balance at end of the year	$ 27	$ 37	$ 36

Cabot and certain subsidiaries are under audit in a number of jurisdictions. In addition, certain statutes of limitations are scheduled to expire in the near future. It is reasonably possible that a further change in the unrecognized tax benefits may occur within the next twelve months related to the settlement of one or more of these audits or the lapse of applicable statutes of limitations; however, an estimated range of the impact on the unrecognized tax benefits cannot be quantified at this time.

Cabot files U.S. federal and state and non-U.S. income tax returns in jurisdictions with varying statutes of limitations. The 2016 through 2018 tax years generally remain subject to examination by the IRS and various tax years from 2005 through 2018 remain subject to examination by the respective state tax authorities. In significant non-U.S. jurisdictions, various tax years from 2003 through 2018 remain subject to examination by their respective tax authorities. As of September 30, 2019, Cabot's significant non-U.S. jurisdictions include Canada, China, France, Germany, Italy, Japan, and the Netherlands.

Note T. Commitments and Contingencies

Operating Lease Commitments

Cabot leases certain transportation vehicles, warehouse facilities, office space, machinery and equipment under cancelable and non-cancelable operating leases, most of which expire within ten years and may be renewed by Cabot. Escalation clauses, lease payments dependent on existing rates/indexes and other lease incentives are included in the minimum lease payments and such lease payments are recognized on a straight-line basis over the minimum lease term. Rent expense under such arrangements for fiscal 2019, 2018 and 2017 totaled $27 million, $32 million and $33 million, respectively. Future minimum rental commitments under non-cancelable leases are as follows:

Years Ending September 30	(In millions)
2020	$ 23
2021	14
2022	9
2023	9
2024	8
2025 and thereafter	68
Total future minimum rental commitments	$ 131

Other Long-Term Commitments

Cabot has entered into long-term purchase agreements primarily for the purchase of raw materials. Under certain of these agreements, the quantity of material being purchased is fixed, but the price paid changes as market prices change. Raw materials purchased under these agreements by segment for fiscal 2019, 2018 and 2017 are as follows:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Reinforcement Materials	$ 393	$ 375	$ 281
Performance Chemicals	65	55	43
Purification Solutions	8	11	7
Total	$ 466	$ 441	$ 331

Included in the table above are raw materials purchases from noncontrolling shareholders of consolidated subsidiaries. These purchases were $156 million during both fiscal 2019 and fiscal 2018 and $116 million during fiscal 2017, and accounts payable and accrued liabilities owed to noncontrolling shareholders as of September 30, 2019 and 2018, were $20 million and $8 million, respectively.

For these purchase commitments, the amounts included in the table below are based on market prices as of September 30, 2019 which may differ from actual market prices at the time of purchase.

	Payments Due by Fiscal Year						
	2020	2021	2022	2023	2024	Thereafter	Total
				(In millions)			
Reinforcement Materials	$ 218	$ 123	$ 116	$ 108	$ 107	$ 1,246	$ 1,918
Performance Chemicals	57	55	53	35	30	402	$ 632
Purification Solutions	6	1	—	—	—	—	7
Total	$ 281	$ 179	$ 169	$ 143	$ 137	$ 1,648	$ 2,557

The Company has also entered into long-term purchase agreements primarily for services related to information technology, which are not included in the table above, that total $12 million as of September 30, 2019, the majority of which is expected to be paid within the next 5 years.

Guarantee Agreements

Cabot has provided certain indemnities pursuant to which it may be required to make payments to an indemnified party in connection with certain transactions and agreements. In connection with certain acquisitions and divestitures, Cabot has provided routine indemnities with respect to such matters as environmental, tax, insurance, product and employee liabilities. In connection with various other agreements, including service and supply agreements with customers, Cabot has provided indemnities for certain contingencies and routine warranties. Cabot is unable to estimate the maximum potential liability for these types of indemnities as a maximum obligation is not explicitly stated in most cases and the amounts, if any, are dependent upon the outcome of future contingent events, the nature and likelihood of which cannot be reasonably estimated. The duration of the indemnities vary, and in many cases are indefinite. Cabot has not recorded any liability for these indemnities in the consolidated financial statements, except as otherwise disclosed.

Self-Insurance and Retention for Certain Contingencies

The Company is partially self-insured for certain third-party liabilities globally, as well as workers' compensation and employee medical benefits in the United States. The third-party and workers' compensation liabilities are managed through a wholly-owned insurance captive and the related liabilities are included in the consolidated financial statements. The employee medical obligations are managed by a third-party provider and the related liabilities are included in the consolidated financial statements. To limit Cabot's potential liabilities for these risks, however, the Company purchases insurance from third-parties that provides stop-loss protection. The self-insured liability in fiscal 2019 for third-party liabilities was $500,000 per accident for auto, $2 million per occurrence for all other, $1 million per accident for U.S. workers' compensation, and the retention for medical costs in the United States is at most $250,000 per person per annum.

Contingencies

Cabot is a defendant, or potentially responsible party, in various lawsuits and environmental proceedings wherein substantial amounts are claimed or at issue.

Environmental Matters

As of September 30, 2019 and 2018, Cabot had $13 million and $15 million, respectively, reserved for environmental matters. These environmental matters mainly relate to former operations. The Company's reserves for environmental matters represent Cabot's best estimates of the probable costs to be incurred at those sites where costs are reasonably estimable based on the Company's analysis of the extent of clean up required, alternative clean-up methods available, abilities of other responsible parties to contribute and its interpretation of laws and regulations applicable to each site. In fiscal 2019 and 2018, there was $9 million and $12 million, respectively, in Accounts payable and accrued liabilities in the Consolidated Balance Sheets for environmental matters. In fiscal 2019 and 2018, there was $4 million and $3 million, respectively in Other liabilities in the Consolidated Balance Sheets for environmental matters. Cabot reviews the adequacy of the reserves as circumstances change at individual sites and adjusts the reserves as appropriate. Almost all of Cabot's environmental issues relate to sites that are mature and have been investigated and studied and, in many cases, are subject to agreed upon remediation plans. However, depending on the results of future testing, changes in risk assessment practices, remediation techniques and regulatory requirements, newly discovered conditions, and other factors, it is reasonably possible that the Company could incur additional costs in excess of environmental reserves currently recorded. Management estimates, based on the latest available information, that any such future environmental remediation costs that are reasonably possible to be in excess of amounts already recorded would be immaterial to the Company's consolidated financial statements.

Charges for environmental expense were less than $1 million in fiscal 2019, $6 million in fiscal 2018 and less than $1 million in fiscal 2017, and are included in Cost of sales in the Consolidated Statements of Operations. Cash payments related to these environmental matters were $2 million in fiscal 2019, $3 million in fiscal 2018 and $2 million in fiscal 2017. The Company anticipates that expenditures related to these environmental matters will be made over a number of years.

The operation and maintenance component of the $13 million reserve for environmental matters was $4 million at September 30, 2019.

In November 2013, Cabot entered into a Consent Decree with the EPA and the Louisiana Department of Environmental Quality ("LDEQ") regarding Cabot's three carbon black manufacturing facilities in the U.S. This settlement is related to EPA's national enforcement initiative focused on the U.S. carbon black manufacturing sector alleging non-compliance with certain regulatory and permitting requirements under The Clean Air Act, including the New Source Review ("NSR") construction permitting requirements. Pursuant to this settlement, Cabot is in the process of installing technology controls for the reduction of sulfur dioxide and nitrogen oxide emissions at certain of its carbon black plants.

Respirator Liabilities

Cabot has exposure in connection with a safety respiratory products business that a subsidiary acquired from American Optical Corporation ("AO") in an April 1990 asset purchase transaction. The subsidiary manufactured respirators under the AO brand and disposed of that business in July 1995. In connection with its acquisition of the business, the subsidiary agreed, in certain circumstances, to assume a portion of AO's liabilities, including costs of legal fees together with amounts paid in settlements and judgments, allocable to AO respiratory products used prior to the 1990 purchase by the Cabot subsidiary. In exchange for the subsidiary's assumption of certain of AO's respirator liabilities, AO agreed to provide to the subsidiary the benefits of: (i) AO's insurance coverage for the period prior to the 1990 acquisition and (ii) a former owner's indemnity of AO holding it harmless from any liability allocable to AO respiratory products used prior to May 1982.

Generally, these respirator liabilities involve claims for personal injury, including asbestosis, silicosis and coal worker's pneumoconiosis, allegedly resulting from the use of respirators that are alleged to have been negligently designed and/or labeled. Neither Cabot, nor its past or present subsidiaries, at any time manufactured asbestos or asbestos-containing products. At no time did this respiratory product line represent a significant portion of the respirator market.

The subsidiary transferred the business to Aearo Corporation ("Aearo") in July 1995. Cabot agreed to have the subsidiary retain certain liabilities associated with exposure to asbestos and silica while using respirators prior to the 1995 transaction so long as Aearo paid, and continues to pay, Cabot an annual fee of $400,000. Aearo can discontinue payment of the fee at any time, in which case it will assume the responsibility for and indemnify Cabot against those liabilities which Cabot's subsidiary had agreed to retain. The Company anticipates that it will continue to receive payment of the $400,000 fee from Aearo and thereby retain these liabilities for the foreseeable future. Cabot has no liability in connection with any products manufactured by Aearo after 1995.

In addition to Cabot's subsidiary and as described above, other parties are responsible for significant portions of the costs of respirator liabilities, leaving Cabot's subsidiary with a portion of the liability in only some of the pending cases. These parties include Aearo, AO, AO's insurers, another former owner and its insurers and a third-party manufacturer of respirators formerly sold under the AO brand and its insurers (collectively, with the Company's subsidiary, the "Payor Group").

As of both September 30, 2019 and 2018, there were approximately 35,000 claimants in pending cases asserting claims against AO in connection with respiratory products. The vast majority of these claims have been pending for more than 10 years with little or no activity and have therefore been excluded from the Company's estimates of its liability for respirator claims. Cabot has contributed to the Payor Group's defense and settlement costs with respect to a percentage of pending claims depending on several factors, including the period of alleged product use. In order to quantify Cabot's estimated share of liability for pending and future respirator liability claims, Cabot has engaged, through counsel, the assistance of Nathan Associates, Inc. ("Nathan"), a leading consulting firm in the field of tort liability valuation. The methodology used to estimate the liability addresses the complexities surrounding Cabot's potential liability by making assumptions about Cabot's likely exposure related to claims pending for less than 10 years and the estimated number of future claimants with respect to periods of asbestos, silica and coal mine dust exposure and respirator use. Using those and other assumptions, the Company estimates the costs that would be incurred in defending and resolving both currently pending and future claims. During the year ended September 30, 2019, the Company updated this estimate with the assistance of Nathan. Based on the updated estimate, the Company increased its reserve as of September 30, 2019 for Cabot's estimated share of the liability for pending and future respirator claims and recorded a charge of $20 million, which is included in Selling and administrative expenses in the Consolidated Statements of Operations. This increase, as well as the higher payments the Company made in fiscal 2019, reflect higher costs of defending and resolving these claims. Based on these estimates, as of September 30, 2019 and 2018, the Company had $35 million and $25 million, respectively, reserved for its estimated share of liability for pending and future respirator claims. In fiscal 2018, the company recorded a charge of $10 million related to the respirator liability which was included in Selling and administrative expenses in the Consolidated Statements of Operations. No charge related to the respirator liability was recorded in fiscal 2017. The Company made payments related to its respirator liability of $10 million in fiscal 2019 and $3 million in both fiscal 2018 and 2017.

The Company's current estimate of the cost of its share of existing and future respirator liability claims is based on facts and circumstances existing at this time. Developments that could affect the Company's estimate include, but are not limited to, (i) significant changes in the number of future claims, (ii) changes in the rate of dismissals without payment of pending claims, (iii) significant changes in the average cost of resolving claims, including potential settlements of groups of claims, (iv) significant changes in the legal costs of defending these claims, (v) changes in the nature of claims received, (vi) trial and appellate outcomes, (vii) changes in the law and procedure applicable to these claims, (viii) the financial viability of members of the Payor Group, (ix) a change in the availability of the insurance coverage of the members of the Payor Group or the indemnity provided by AO's former owner, (x) changes in the allocation of costs among the Payor Group and (xi) a determination that the assumptions that were used to estimate the Company's share of liability are no longer reasonable. The Company cannot determine the impact of these potential developments on its current estimate of its share of liability for existing and future claims. Accordingly, the actual amount of these liabilities for existing and future claims could be different than the reserved amount.

Other Matters

The Company has various other lawsuits, claims and contingent liabilities arising in the ordinary course of its business and with respect to its divested businesses. The Company does not believe that any of these matters will have a material adverse effect on its financial position; however, litigation is inherently unpredictable. Cabot could incur judgments, enter into settlements or revise its expectations regarding the outcome of certain matters, and such developments could have a material impact on its results of operations in the period in which the amounts are accrued or its cash flows in the period in which the amounts are paid.

Note U. Financial Information by Segment & Geographic Area

Segment Information

The Company identifies a business as an operating segment if: i) it engages in business activities from which it may earn revenues and incur expenses; ii) its operating results are regularly reviewed by the Chief Operating Decision Maker ("CODM"), who is Cabot's President and Chief Executive Officer, to make decisions about resources to be allocated to the segment and assess its performance; and iii) it has available discrete financial information. The Company has determined that all of its businesses are operating segments. The CODM reviews financial information at the operating segment level to allocate resources and to assess the operating results and financial performance for each operating segment. Operating segments are aggregated into a reportable segment if the operating segments are determined to have similar economic characteristics and if the operating segments are similar in the following areas: i) nature of products and services; ii) nature of production processes; iii) type or class of customer for their products and services; iv) methods used to distribute the products or provide services; and v) if applicable, the nature of the regulatory environment.

The Company had four reportable segments through June 28, 2019: Reinforcement Materials, Performance Chemicals, Purification Solutions, and Specialty Fluids. The Specialty Fluids business was divested as of June 28, 2019 and since that time Cabot has been organized into the three remaining reportable business segments.

The Reinforcement Materials segment combines the rubber blacks and elastomer composites product lines.

The Performance Chemicals segment combines the specialty carbons, fumed metal oxides and aerogel product lines into the Performance Additives business, and combines the specialty compounds and inkjet colorants product lines into the Formulated Solutions business. These businesses are similar in terms of economic characteristics, nature of products, processes, customer class and product distribution methods, and therefore have been aggregated into one reportable segment.

The Purification Solutions segment represents the Company's activated carbon business and the Specialty Fluids segment included cesium formate oil and gas drilling fluids and high-purity fine cesium chemicals product lines.

Income (loss) from continuing operations before income taxes ("Segment EBIT") is presented for each reportable segment in the financial information by the reportable segment table below on the line entitled Income (loss) from continuing operations before taxes. Segment EBIT excludes certain items, meaning items management does not consider representative of on-going operating segment results. In addition, Segment EBIT includes Equity in earnings of affiliated companies, net of tax, the full operating results of a contractual joint venture in Purification Solutions, royalties, Net income (loss) attributable to noncontrolling interests, net of tax, and discounting charges for certain Notes receivable, but excludes Interest expense, foreign currency transaction gains and losses, interest income, dividend income, unearned revenue, general unallocated expense and unallocated corporate costs. Segment assets exclude cash, short-term investments, cost investments, income taxes receivable, deferred taxes and headquarters' assets, which are included in unallocated and other. Expenditures for additions to long-lived assets include total equity and other investments (including available-for-sale securities) and property, plant and equipment.

Reinforcement Materials

Carbon black is a form of elemental carbon that is manufactured in a highly controlled process to produce particles and aggregates of varied structure and surface chemistry, resulting in many different performance characteristics for a wide variety of applications. Rubber grade carbon blacks are used to enhance the physical properties of the systems and applications in which they are incorporated.

The Company's rubber blacks products are used in tires and industrial products. Rubber blacks have traditionally been used in the tire industry as a rubber reinforcing agent to increase tread durability and are also used as a performance additive to reduce rolling resistance and improve traction. In industrial products such as hoses, belts, extruded profiles and molded goods, rubber blacks are used to improve the physical performance of the product, including the product's physical strength, fluid resistance, conductivity and resistivity.

In addition to its rubber blacks products, the Company manufactures compounds of carbon black and rubber using its patented elastomer composites manufacturing process. These compounds improve abrasion/wear resistance, reduce fatigue of rubber parts and reduce rolling resistance compared to carbon black/rubber compounds made by conventional dry mix methods.

Performance Chemicals

Performance Chemicals is organized into two businesses: the Company's Performance Additives business and its Formulated Solutions business. The Company's Performance Additives business combines its specialty grades of carbon black, fumed metal oxides and aerogel product lines, and its Formulated Solutions business combines its specialty compounds and inkjet product lines. In Performance Chemicals, the Company designs, manufactures and sells materials that deliver performance in a broad range of customer applications across the automotive, construction, infrastructure, energy, inkjet printing, electronics, and consumer products sectors. The net sales from each of these businesses for fiscal 2019, 2018 and 2017 are as follows:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Performance Additives	$ 694	$ 707	$ 650
Formulated Solutions	301	321	258
Total Performance Chemicals	$ 995	$ 1,028	$ 908

Performance Additives Business

The Company's specialty grades of carbon black are used to impart color, provide rheology control, enhance conductivity and static charge control, provide UV protection, enhance mechanical properties, and provide formulation flexibility through surface treatment. These specialty carbon products are used in a wide variety of applications, such as inks, coatings, cables, plastics, adhesives, toners, batteries and displays.

Fumed silica is an ultra-fine, high-purity particle used as a reinforcing, thickening, abrasive, thixotropic, suspending or anti-caking agent in a wide variety of products for the automotive, construction, microelectronics, batteries, and consumer products industries. These products include adhesives, sealants, cosmetics, batteries, inks, toners, silicone elastomers, coatings, polishing slurries and pharmaceuticals. Fumed alumina, also an ultra-fine, high-purity particle, is used as an abrasive, absorbent or barrier agent in a variety of products, such as inkjet media, lighting, coatings, cosmetics and polishing slurries.

Aerogel is a hydrophobic, silica-based particle with a high surface area that is used in a variety of thermal insulation and specialty chemical applications. In the building and construction industry, the product is used in insulative sprayable plasters and composite building products, as well as translucent skylight, window, wall and roof systems for insulating eco-daylighting applications. In the specialty chemicals industry, the product is used to provide matte finishing, insulating and thickening properties for use in a variety of applications.

Formulated Solutions Business

Cabot's masterbatch and conductive compound products, which Cabot refers to as "specialty compounds", are formulations derived from specialty grades of carbon black mixed with polymers and other additives. These products are generally used by plastic resin producers and converters in applications for the automotive, industrial, packaging, infrastructure, agricultural, consumer products, and electronics industries. As an alternative to directly mixing specialty carbon blacks, these formulations offer greater ease of handling and help customers achieve their desired levels of dispersion and color and manage the addition of small doses of additives. In addition, Cabot's electrically conductive compound products generally are used to help ensure uniform conductive performance and reduce risks associated with electrostatic discharge in plastics applications.

The Company's inkjet colorants are high-quality pigment-based black and color dispersions based on its patented carbon black surface modification technology. The dispersions are used in aqueous inkjet inks to impart color, sharp print characteristics and durability, while maintaining high printhead reliability. These products are used in various inkjet printing applications, including commercial printing, small office/home office and corporate office, that require a high level of dispersibility and colloidal stability. Cabot's inkjet inks, which utilize its pigment-based colorant dispersions, are used in the commercial printing segment for digital print.

Purification Solutions

The Company's activated carbon products are used for the purification of water, air, food and beverages, pharmaceuticals and other liquids and gases, as either a colorant or a decolorizing agent in the production of products for food and beverage applications and as a chemical carrier in slow release applications. In gas and air applications, one of the uses of activated carbon is for the removal of mercury in flue gas streams. In certain applications, used activated carbon can be reactivated for further use by removing the contaminants from the pores of the activated carbon product. The most common applications for the Company's reactivated carbon are water treatment and food and beverage purification. In addition to activated carbon production and reactivation, the Company also provides activated carbon solutions through on-site equipment and services, including delivery systems for activated carbon injection in coal-fired utilities, mobile water filter units and carbon reactivation services.

Specialty Fluids

Cabot divested its Specialty Fluids business on June 28, 2019. Refer to Note D for the terms of this transaction. The Specialty Fluids segment produced and marketed a range of cesium products that included cesium formate brines and other fine cesium chemicals. Cesium formate brines are used as a drilling and completion fluid primarily in high pressure and high temperature oil and gas well construction. Fine cesium chemicals are used across a wide range of industries and applications that include catalysts, doping agents and brazing fluxes.

Financial information by reportable segment is as follows:

Years Ended September 30	Reinforcement Materials	Performance Chemicals	Purification Solutions	Specialty Fluids	Segment Total[1]	Unallocated and Other[2], [4]	Consolidated Total
				(In millions)			
2019							
Revenues from external customers[3]	$ 1,815	$ 995	$ 278	$ 56	$ 3,144	$ 193	$ 3,337
Depreciation and amortization	$ 69	$ 51	$ 26	$ 1	$ 147	$ 1	$ 148
Equity in earnings of affiliated companies	$ (1)	$ 1	$ 3	$ —	$ 3	$ (2)	$ 1
Income (loss) from continuing operations before income taxes[4]	$ 266	$ 152	$ 2	$ 24	$ 444	$ (189)	$ 255
Assets[5]	$ 1,177	$ 1,024	$ 436	$ —	$ 2,637	$ 367	$ 3,004
Total expenditures for additions to long-lived assets[6]	$ 82	$ 148	$ 11	$ 1	$ 242	$ 5	$ 247
2018							
Revenues from external customers[3]	$ 1,774	$ 1,028	$ 279	$ 45	$ 3,126	$ 116	$ 3,242
Depreciation and amortization	$ 70	$ 48	$ 32	$ 2	$ 152	$ (3)	$ 149
Equity in earnings of affiliated companies	$ 1	$ —	$ 6	$ —	$ 7	$ (5)	$ 2
Income (loss) from continuing operations before income taxes[4]	$ 279	$ 200	$ (7)	$ 8	$ 480	$ (363)	$ 117
Assets[5]	$ 1,319	$ 919	$ 460	$ 178	$ 2,876	$ 368	$ 3,244
Total expenditures for additions to long-lived assets[6]	$ 97	$ 94	$ 16	$ 17	$ 224	$ 5	$ 229
2017							
Revenues from external customers[3]	$ 1,381	$ 908	$ 281	$ 41	$ 2,611	$ 106	$ 2,717
Depreciation and amortization	$ 69	$ 46	$ 39	$ 2	$ 156	$ (1)	$ 155
Equity in earnings of affiliated companies	$ 6	$ —	$ 6	$ —	$ 12	$ (5)	$ 7
Income (loss) from continuing operations before income taxes[4]	$ 193	$ 201	$ 6	$ 9	$ 409	$ (110)	$ 299
Assets[5]	$ 1,189	$ 708	$ 741	$ 140	$ 2,778	$ 560	$ 3,338
Total expenditures for additions to long-lived assets[6]	$ 68	$ 47	$ 19	$ 5	$ 139	$ 8	$ 147

(1) Cabot divested its Specialty Fluids business on June 28, 2019. Refer to Note D for the terms of this transaction.

(2) Unallocated and Other includes certain items and eliminations necessary to reflect management's reporting of operating segment results. These items are reflective of the segment reporting presented to the CODM.

(3) Consolidated Total Revenues from external customers reconciles to Net sales and other operating revenues on the Consolidated Statements of Operations. Revenues from external customers that are categorized as Unallocated and Other reflects royalties, external shipping and handling fees, the impact of unearned revenue, the removal of 100% of the sales of an equity method affiliate and discounting charges for certain Notes receivable. Details are provided in the table below.

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Royalties, the impact of unearned revenue, the removal of 100% of the sales of an equity method affiliate and discounting charges for certain Notes receivable	$ (13)	$ 11	$ 11
Shipping and handling fees	130	105	95
By-product sales[a]	76	—	—
Total	$ 193	$ 116	$ 106

(a) As of October 1, 2018, as part of the adoption of the new FASB accounting standard, *Revenue from Contracts with Customers*, the Company began presenting revenue from by-products produced in manufacturing operations in Net sales and other operating revenues, which in prior years was included as a reduction in Cost of sales.

(4) Consolidated Total Income (loss) from continuing operations before income taxes reconciles to Income (loss) from continuing operations before income taxes and equity in earnings of affiliated companies on the Consolidated Statements of Operations. Total Income (loss) from continuing operations before income taxes that are categorized as Unallocated and Other includes:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
Interest expense	$ (59)	$ (54)	$ (53)
Certain items:[a]			
Specialty Fluids loss on sale and asset impairment charge (Note D)	(29)	—	—
Legal and environmental matters and reserves	(21)	(16)	1
Global restructuring activities (Note P)	(16)	30	(3)
Equity affiliate investment impairment charge (Note M)	(11)	—	—
Acquisition and integration-related charges	(6)	(2)	—
Executive transition costs	(1)	(2)	—
Purification Solutions goodwill and long-lived assets impairment charge (Note G)	—	(254)	—
Inventory reserve adjustment	—	(13)	—
Gains (losses) on sale of investments	—	10	—
Other certain items	(3)	(1)	(1)
Total certain items, pre-tax	(87)	(248)	(3)
Unallocated corporate costs[b]	(50)	(61)	(50)
General unallocated income (expense)[c]	8	2	3
Less: Equity in earnings of affiliated companies, net of tax[d]	1	2	7
Total	$ (189)	$ (363)	$ (110)

(a) Certain items are items that management does not consider representative of operating segment results and they are, therefore, excluded from Segment EBIT.

(b) Unallocated corporate costs are not controlled by the segments and primarily benefit corporate interests.

(c) General unallocated income (expense) consists of gains (losses) arising from foreign currency transactions, net of other foreign currency risk management activities, interest income, dividend income, the profit or loss related to the corporate adjustment for unearned revenue, and the impact of including the full operating results of a contractual joint venture in Purification Solutions Segment EBIT.

(d) Equity in earnings of affiliated companies, net of tax is included in Segment EBIT and is removed from Unallocated and other to reconcile to income (loss) from operations before taxes.

(5) Unallocated and Other assets includes cash, marketable securities, cost investments, income taxes receivable, deferred taxes, headquarters' assets, and current and non-current assets held for sale.

(6) Expenditures for additions to long-lived assets include total equity and other investments (including available-for-sale securities) and property, plant and equipment.

Geographic Information

Revenues from external customers attributable to an individual country, other than the U.S. and China, were not material for disclosure. Revenues from external customers by individual country are summarized as follows:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
United States	$ 702	$ 676	$ 645
China	738	752	573
Other countries	1,897	1,814	1,499
Total	$ 3,337	$ 3,242	$ 2,717

Each of the Company's segments operate globally. In addition to presenting Revenue from external customers by reportable segment, the following tables further disaggregate Revenue from external customers by geographic region.

	Year Ended September 30, 2019				
	Reinforcement Materials	Performance Chemicals	Purification Solutions	Specialty Fluids	Consolidated Total
			(In millions)		
Americas	$ 688	$ 294	$ 126	$ 6	$ 1,114
Asia Pacific	769	353	35	1	1,158
Europe, Middle East and Africa	358	348	117	49	872
Segment revenues from external customers	1,815	995	278	56	3,144
Unallocated and other					193
Net sales and other operating revenues					$ 3,337

Long-lived assets attributable to an individual country, other than the U.S. and China, were not material for disclosure. Long-lived asset information by individual country is summarized as follows:

	Years Ended September 30		
	2019	2018	2017
		(In millions)	
United States	$ 572	$ 493	$ 493
China	264	270	261
Other countries	512	533	551
Total	$ 1,348	$ 1,296	$ 1,305

Note V. Unaudited Quarterly Financial Information

Unaudited financial results by quarter for fiscal 2019 and 2018 are summarized below:

	Quarters Ended				Year Ended
	December 31, 2018	March 31, 2019	June 30, 2019	September 30, 2019	September 30, 2019
			(In millions, except per share amounts)		
Net sales and other operating revenues	$ 821	$ 844	$ 845	$ 827	$ 3,337
Gross profit	$ 166	$ 178	$ 170	$ 171	$ 685
Net income (loss)	$ 77	$ 29	$ 40	$ 40	$ 186
Net income (loss) attributable to Cabot Corporation	$ 69	$ 23	$ 32	$ 33	$ 157
Earnings per common share—basic	$ 1.14	$ 0.39	$ 0.55	$ 0.56	$ 2.64
Earnings per common share—diluted	$ 1.14	$ 0.39	$ 0.55	$ 0.55	$ 2.63

During the fourth quarter of fiscal 2019, Cabot recorded a pre-tax charge of $20 million related to its respirator liabilities as discussed further in Note T.

	Quarters Ended				Year Ended
	December 31, 2017	March 31, 2018	June 30, 2018	September 30, 2018	September 30, 2018
	(In millions, except per share amounts)				
Net sales and other operating revenues	$ 720	$ 818	$ 854	$ 850	$ 3,242
Gross profit	$ 176	$ 188	$ 197	$ 211	$ 772
Net income (loss)	$ (112)	$ (163)	$ 99	$ 102	$ (74)
Net income (loss) attributable to Cabot Corporation	$ (122)	$ (173)	$ 88	$ 94	$ (113)
Earnings per common share—basic	$ (1.98)	$ (2.80)	$ 1.41	$ 1.51	$ (1.85)
Earnings per common share—diluted	$ (1.98)	$ (2.80)	$ 1.40	$ 1.51	$ (1.85)

During the fourth quarter of fiscal 2018, Cabot recorded a pre-tax gain of $28 million on the sale of its land rights in Thane, India as discussed further in Note P. In addition, the tax benefit for the fourth quarter of fiscal 2018 includes a $19 million net benefit from discrete tax items primarily related to a revision of the estimate of the impact of the recent U.S. tax reform as discussed further in Note S.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the shareholders and the Board of Directors of Cabot Corporation

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Cabot Corporation and subsidiaries (the "Company") as of September 30, 2019 and 2018, the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows, for each of the three years in the period ended September 30, 2019, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of September 30, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended September 30, 2019, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of September 30, 2019, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated November 22, 2019, expressed an unqualified opinion on the Company's internal control over financial reporting.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current-period audit of the financial statements that were communicated or required to be communicated to the audit committee and that (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the 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.

Income Taxes — Accounting for Global Intangible Low-Taxed Income (GILTI) and Base Erosion and Anti-Abuse Tax (BEAT) — Refer to Note S to the financial statements

Critical Audit Matter Description

The Company operates in over 20 countries and is subject to income tax in each tax jurisdiction in which it operates. The Company became subject to the taxation of GILTI earned by foreign subsidiaries and BEAT for the first time in the year ended September 30, 2019. The Company’s calculation of foreign income subject to GILTI is complex, requiring significant inputs of data, as well as judgment, to determine the foreign income subject to GILTI. In addition, management’s determination of certain intercompany payments that are exempt from the BEAT computation based on the guidance provided by the Internal Revenue Service (IRS), required significant judgment.

We identified the evaluation of the accounting for GILTI and BEAT as a critical audit matter because of the significant judgments made by management and the complex application of the GILTI requirements. This required a high degree of auditor judgment and increased extent of effort, including the need to involve our income tax specialists, when performing audit procedures to evaluate the Company’s interpretation and application of the GILTI and BEAT provisions.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to the application of the BEAT and GILTI provisions included the following, among others:

- We tested the effectiveness of controls over the Company's determination of the impact of GILTI and BEAT in the initial year, including management's review of the applicable provisions and supporting calculations.
- With the assistance of our income tax specialists, we evaluated the Company's analysis of BEAT by assessing the reasonableness of the methodology used to determine the base erosion percentage by:
  - Assessing each component of the base erosion percentage, including the completeness and accuracy of the foreign related party payments, gross deductions, and exemptions.
  - Testing the mathematical accuracy of the base erosion percentage and current year provision.
- With the assistance of our income tax specialists, we evaluated the GILTI expense and management's application of the GILTI income calculation by:
  - Testing the reasonableness of the methodology used to determine income earned by controlled foreign corporations (CFC) to be included in the gross income of the CFCs' U.S. shareholder.
  - Assessing each component of the GILTI tax, including the Company's calculation of tested income/loss of all CFCs, including determining whether the Company's calculation is computed under U.S. tax rules.
  - Testing the completeness and accuracy of the qualified business asset investment and foreign tax credits associated with GILTI.
  - Performing an independent modeling of the Company's GILTI computation.
  - Testing the mathematical accuracy of the current year expense.

Commitments and Contingencies — Respirator Liabilities — Refer to Note T to the financial statements

Critical Audit Matter Description

The Company has exposure in connection with a safety respiratory products business previously owned by one of its subsidiaries. In response to the exposure, the Company has recorded a $35 million reserve, referred to as respirator liabilities. The respirator liabilities are recorded based on management's assumptions, including the number of future claims and the estimated costs to defend and resolve these claims.

We identified respirator liabilities as a critical audit matter because there is significant uncertainty related to the number of future claims and the estimate of the cost to defend and resolve these claims. This required a high degree of auditor judgment and an increased extent of effort, including the need to involve our actuarial specialists, when performing audit procedures to evaluate the reasonableness of the recorded respirator liabilities as of September 30, 2019.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to respirator liabilities included the following, among others:

- We tested the effectiveness of controls over management's review of the work performed by the Company's tort liability consultants, the assumptions utilized, claims data, and the calculation of the respirator liabilities.
- We evaluated the methods and assumptions used by management to estimate the respirator liabilities by:
  - Testing the underlying historical claims data, which served as the basis for the analysis of the Company's tort liability consultant, for completeness and accuracy of the inputs to the estimate.
  - Utilizing our actuarial specialists to assist with testing the assumptions regarding future unasserted claims and the costs to defend and resolve those claims.
  - Utilizing our actuarial specialists to assist with the calculation of an independent estimate of the respirator liabilities, and comparing our estimate to the Company's estimate.
- We assessed the appropriateness of the disclosures in the financial statements.

/s/ Deloitte & Touche LLP

Boston, Massachusetts
November 22, 2019

We have served as the Company's auditor since 2007.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of Cabot Corporation

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Cabot Corporation and subsidiaries (the "Company") as of September 30, 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 Company maintained, in all material respects, effective internal control over financial reporting as of September 30, 2019, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended September 30, 2019, of the Company and our report dated November 22, 2019, expressed an unqualified opinion on those financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying *Management's Annual Report on Internal Control Over Financial Reporting*. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the 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 audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

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 (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) 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 (3) 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.

/s/ Deloitte & Touche LLP

Boston, Massachusetts
November 22, 2019

PART II

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

None.

Item 9A. ***Controls and Procedures***

Disclosure Controls and Procedures

Cabot carried out an evaluation, under the supervision and with the participation of its management, including its principal executive officer and its principal financial officer, of the effectiveness of the Company’s disclosure controls and procedures pursuant to Rule 13a-15 under the Securities Exchange Act of 1934, as amended (the “Exchange Act”), as of September 30, 2019. Based on that evaluation, Cabot’s principal executive officer and its principal financial officer concluded that the Company’s disclosure controls and procedures are effective with respect to the recording, processing, summarizing and reporting, within the time periods specified in the Securities and Exchange Commission’s rules and forms, of information required to be disclosed by the Company in the reports that it files or submits under the Exchange Act and such information is accumulated and communicated to management to allow timely decisions regarding required disclosure.

Management’s Annual Report on Internal Control Over Financial Reporting

Cabot’s management is responsible for establishing and maintaining adequate internal control over financial reporting for Cabot. Internal control over financial reporting is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act as a process designed by, or under the supervision of, a company’s principal executive and principal financial officers, and effected by the company’s board of directors, management and other personnel, 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 and includes those policies and procedures that:

- Pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the company;
- 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
- 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 the 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 policies or procedures may deteriorate.

Cabot’s management assessed the effectiveness of Cabot’s internal control over financial reporting as of September 30, 2019 based on the framework established in *Internal Control—Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this assessment, Cabot’s management concluded that Cabot’s internal control over financial reporting was effective as of September 30, 2019.

Cabot’s internal control over financial reporting as of September 30, 2019 has been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report above.

Changes in Internal Control Over Financial Reporting

There were no changes in the Company’s internal control over financial reporting that occurred during the Company’s fiscal quarter ending September 30, 2019 that have materially affected, or are reasonably likely to materially affect, the Company’s internal control over financial reporting.

Item 9B. ***Other Information***

None.

PART III

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

Certain information regarding our executive officers is included at the end of Part I of this annual report under the heading "Information about our Executive Officers."

Cabot has adopted a Code of Business Ethics that applies to all of the Company's employees and directors, including the Chief Executive Officer, the Chief Financial Officer, the Controller and other senior financial officers. The Code of Business Ethics is posted on our website, www.cabotcorp.com (under the "About Cabot" caption under "Company"). We intend to satisfy the disclosure requirement regarding any amendment to, or waiver of, a provision of the Code of Business Ethics applicable to the Chief Executive Officer, the Chief Financial Officer, the Controller or other senior financial officers by posting such information on our website.

The other information required by this item will be included in our Proxy Statement for the 2020 Annual Meeting of Stockholders ("Proxy Statement") and is herein incorporated by reference.

Item 11. *Executive Compensation*

The information required by this item will be included in our Proxy Statement and is incorporated herein by reference.

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

The information relating to security ownership of certain beneficial owners of our common stock and information relating to the security ownership of our management required by this item will be included in our Proxy Statement and is incorporated herein by reference.

The following table provides information as of September 30, 2019 about: (i) the number of shares of common stock that may be issued upon exercise of outstanding options and vesting of restricted stock units; (ii) the weighted-average exercise price of outstanding options; and (iii) the number of shares of common stock available for future issuance under our active plans: the 2017 Long-Term Incentive Plan and the 2015 Directors' Stock Compensation Plan. All of our equity compensation plans have been approved by our stockholders.

Plan category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (a)[1]	Weighted-average exercise price of outstanding option, warrants and rights (b)[2]	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (c)[3]
Equity compensation plans approved by security holders	1,897,805	$ 50.57	4,301,155
Equity compensation plans not approved by security holders	N/A	N/A	N/A

(1) Includes (i) 1,021,570 shares issuable upon exercise of outstanding stock options, (ii) 404,018 shares issuable upon vesting of time-based restricted stock units, (iii) 248,829 shares issuable upon vesting of performance-based restricted stock units based upon the achievement of the annual financial performance metrics for the three years within the three-year performance period of the fiscal 2017 awards, the first two years within the three-year performance period of the fiscal 2018 awards, and the first year within the three-year performance period of the fiscal 2019 awards; and (iv) 223,388 shares issuable upon vesting of the performance-based stock units attributable to year three of the 2018 awards and years two and three of the 2019 awards, assuming Cabot performs at the maximum performance level in each of those years. If, instead, Cabot performs at the target level of performance in those years, a total of 111,694 shares would be issuable for year three of the 2018 awards and years two and three of the 2019 awards.

(2) The weighted-average exercise price includes all outstanding stock options but does not include restricted stock units which do not have an exercise price.

(3) Of these shares, (i) 4,036,447 shares remain available for future issuance under our 2017 Long-Term Incentive Plan, and (ii) 264,708 remain available for future issuance under our 2015 Directors' Stock Compensation Plan.

The other information required by this item will be included in our Proxy Statement and is incorporated herein by reference.

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

The information required by this item will be included in our Proxy Statement and is incorporated herein by reference.

Item 14. *Principal Accounting Fees and Services*

The information required by this item will be included in our Proxy Statement and is incorporated herein by reference.

PART IV

Item 15. *Exhibits, Financial Statement Schedules*

(a) *Financial Statements*.

See "Index to Financial Statements" under Item 8 of this Form 10-K.

(b) *Schedules*.

The Schedules have been omitted since the required information is not applicable or is not present in amounts sufficient to require submission of the schedule, or because the information required is included in the consolidated financial statements and notes thereto included in this Form 10-K.

(c) *Exhibits*. (Certain exhibits not included in copies of the Form 10-K sent to stockholders.)

The exhibit numbers in the Exhibit Index correspond to the numbers assigned to such exhibits in the Exhibit Table of Item 601 of Regulation S-K. Cabot will furnish to any stockholder, upon written request, any exhibit listed in the Exhibit Index, upon payment by such stockholder of the Company's reasonable expenses in furnishing such exhibit.

Exhibit Number	Description
3(a)	Restated Certificate of Incorporation of Cabot Corporation effective January 9, 2009 (incorporated herein by reference to Exhibit 3.1 of Cabot's Quarterly Report on Form 10-Q for the quarterly period ended December 31, 2008, file reference 1-5667, filed with the SEC on February 9, 2009).
3(b)	The By-laws of Cabot Corporation as amended January 8, 2016 (incorporated herein by reference to Exhibit 3.1 of Cabot's Corporation's Quarterly Report on Form 10-Q for the quarterly period ended December 31, 2015, file reference 1-5667, filed with the SEC on February 5, 2016).
4(a)	Indenture, dated as of December 1, 1987, between Cabot Corporation and The First National Bank of Boston, Trustee (the "Indenture"). (incorporated herein by reference to Exhibit 4(a)(i) of Cabot's Annual Report on Form 10-K for its fiscal year ended September 30, 2017, file reference 1-5667, filed with the SEC on November 22, 2017).
4(a)(i)	First Supplemental Indenture, dated as of June 17, 1992, to the Indenture. (incorporated herein by reference to Exhibit 4(a)(ii) of Cabot's Annual Report on Form 10-K for its fiscal year ended September 30, 2017, file reference 1-5667, filed with the SEC on November 22, 2017).
4(a)(ii)	Second Supplemental Indenture, dated as of January 31, 1997, between Cabot Corporation and State Street Bank and Trust Company, Trustee (incorporated herein by reference to Exhibit 4 of Cabot's Quarterly Report on Form 10-Q for the quarterly period ended December 31, 1996, file reference 1-5667, filed with the SEC on February 14, 1997).
4(a)(iii)	Third Supplemental Indenture, dated as of November 20, 1998, between Cabot Corporation and State Street Bank and Trust Company, Trustee (incorporated herein by reference to Exhibit 4.1 of Cabot's Current Report on Form 8-K, dated November 20, 1998, file reference 1-5667, filed with the SEC on November 20, 1998).
4(a)(iv)	Indenture, dated as of September 21, 2009, between Cabot Corporation and U.S. Bank National Association, as Trustee (incorporated herein by reference to Exhibit 4.1 of Cabot's Registration Statement on Form S-3 ASR, Registration Statement No. 333-162021, filed with the SEC on September 21, 2009).
4(a)(v)	Second Supplemental Indenture, dated as of July 12, 2012 between Cabot Corporation, as Issuer, and U.S. Bank National Association, as Trustee, including the form of Global Note attached as Annex A thereto, supplementing the Indenture dated as of September 21, 2009 (incorporated herein by reference to Exhibit 4.1 of Cabot's Current Report on Form 8-K dated July 9, 2012, file reference 1-5667, filed with the SEC on July 12, 2012).
4(a)(vi)	Indenture, dated as of September 15, 2016, between Cabot Corporation and U.S. Bank National Association, as Trustee (incorporated herein by reference to Exhibit 4.1 of Cabot Corporation's Current Report on Form 8-K dated September 15, 2016, file reference 1-5667, filed with the SEC on September 15, 2016).

Exhibit Number	Description
4(a)(vii)	First Supplemental Indenture, dated as of September 15, 2016, between Cabot Corporation and U.S. Bank National Association, as Trustee, including the form of Global Note attached as Annex A thereto, supplementing the Indenture dated as of September 15, 2016 (incorporated herein by reference to Exhibit 4.2 of Cabot Corporation's Current Report on Form 8-K dated September 15, 2016, file reference 1-5667, filed with the SEC on September 15, 2016).
4(a)(viii)	Second Supplemental Indenture, dated June 20, 2019, between Cabot Corporation and U.S. Bank National Association, including the form of Global Note attached as Annex A thereto (incorporated by reference to Exhibit 4.1 of Cabot Corporation's Current Report on Form 8-K dated June 20, 2019, file reference 1-5667, filed with the SEC on June 20, 2019).
4(b)†	Description of Cabot Securities.
10(a)	Credit Agreement, dated October 23, 2015, among Cabot Corporation, JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC, Citigroup Global Markets Inc., Citibank, N.A., Bank of America, N.A., Mizuho Bank, Ltd., TD Bank, N.A., and Wells Fargo Bank, National Association, and the other lenders party thereto (incorporated herein by reference to Exhibit 10(a) of Cabot's Annual Report on Form 10-K for its fiscal year ended September 30, 2015, file reference 1-5667, filed with the SEC on November 25, 2015).
10(a)(i)	Extension Agreement dated December 14, 2016 to the Credit Agreement, dated October 23, 2015, among Cabot Corporation, JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLS, Citigroup Global Markets Inc., Citibank, N.A., Bank of America, N.A., Mizuho Bank, Ltd., TD Bank, N.A., and Wells Fargo Bank, National Association, and the other lenders party thereto (incorporated herein by reference to Exhibit 10.1 of Cabot's Quarterly Report on Form 10-Q for the quarterly period ended December 31, 2016, file reference 1-5667, filed with the SEC on February 7, 2017).
10(a)(ii)	Extension Agreement dated October 6, 2017 to the Credit Agreement dated October 23, 2015, among Cabot Corporation, JPMorgan Chase Bank, N.A., J.P. Morgan Securities U.S., Citigroup Global Markets Inc., Citibank, N.A., Bank of America, N.A., Mizuho Bank, Ltd., TD Bank, N.A., and Wells Fargo Bank, National Association, and the other lenders party thereto (incorporated herein by reference to Exhibit 10.1 of Cabot's Quarterly Report on Form 10-Q for the quarterly period ended December 31, 2017, file reference 1-5667, filed with the SEC on February 8, 2018).
10(b)	Credit Agreement, dated May 22, 2019, among certain subsidiaries of Cabot Corporation, guaranteed by Cabot Corporation, Wells Fargo Bank, National Association, PNC Bank, National Association, Mizuho Bank, Ltd., and the other lenders party thereto (incorporated by reference to Exhibit 10.1 of Cabot 's Current Report on Form 8-K dated May 22, 2019, file reference 1-5667, filed with the SEC on May 29, 2019).
10(c)*	2009 Long-Term Incentive Plan (incorporated herein by reference to Appendix B of Cabot's Proxy Statement on Schedule 14A relating to the 2012 Annual Meeting of Stockholders, file reference 1-5667, filed with the SEC on January 30, 2012).
10(c)(i)*	2017 Long-Term Incentive Plan (incorporated herein by reference to Exhibit 10.1 of Cabot's Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2017, file reference 1-5667, filed with the SEC on May 8, 2017).
10(c)(ii)*	2015 Directors' Stock Compensation Plan (incorporated herein by reference to Appendix B of Cabot's Proxy Statement on Schedule 14A relating to the 2015 Annual Meeting of Stockholders, file reference 1-5667, filed with the SEC on January 28, 2015).
10(d)*	Summary of Compensation for Non-Employee Directors (incorporated herein by reference to Exhibit 10.2 of Cabot's Quarterly Report on Form 10-Q for the quarterly period ended December 31, 2018, file reference 1-5667, filed with the SEC on February 8, 2019).
10(c)(iii)*	Cabot Corporation 2018 Short-Term Incentive Compensation Plan (incorporated herein by reference to Exhibit 10.1 of Cabot's Quarterly Report on Form 10-Q for the quarterly period ended December 31, 2018 file reference 1-5667, filed with the SEC on February 8, 2019).

Exhibit Number	Description
10(e)*	Cabot Corporation Amended and Restated Senior Management Severance Protection Plan, dated March 9, 2012 (incorporated herein by reference to Exhibit 10.5 of Cabot's Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2012, file reference 1-5667, filed with the SEC on May 7, 2012).
10(f)*	Form of Performance-Based Restricted Stock Unit Award Certificate under the Cabot Corporation 2017 Long-Term Incentive Plan (incorporated herein by reference to Exhibit 10(e) of Cabot's Annual Report on Form 10-K for its fiscal year ended September 30, 2019, file reference 1-5667, filed with the SEC on November 21, 2018).
10(g)*	Form of Time-Based Restricted Stock Unit Award Certificate under the Cabot Corporation 2017 Long-Term Incentive Plan (incorporated herein by reference to Exhibit 10(f) of Cabot's Annual Report on Form 10-K for its fiscal year ended September 30, 2019, file reference 1-5667, filed with the SEC on November 21, 2018).
10(h)*	Form of Stock Option Award Certificate under the Cabot Corporation 2017 Long-Term Incentive Plan (incorporated herein by reference to Exhibit 10(g) of Cabot's Annual Report on Form 10-K for its fiscal year ended September 30, 2019 file reference 1-5667, filed with the SEC on November 21, 2018).
10(i)*	Cabot Corporation Deferred Compensation and Supplemental Retirement Plan, amended and restated January 1, 2014 (incorporated herein by reference to Exhibit 10.1 of Cabot's Quarterly Report on Form 10-Q for the quarterly period ended December 31, 2013, file reference 1-5667, filed with the SEC on February 6, 2014).
10(j)*	Cabot Corporation Non-Employee Directors' Deferral Plan, amended and restated January 1, 2014 (incorporated herein by reference to Exhibit 10.2 of Cabot's Quarterly Report on Form 10-Q for the quarterly period ended December 31, 2013, file reference 1-5667, filed with the SEC on February 6, 2014).
21†	Subsidiaries of Cabot Corporation.
23†	Consent of Deloitte & Touche LLP.
31(i)†	Certification of Principal Executive Officer required by Rule 13a-14(a) or Rule 15d-14(a) of the Exchange Act.
31(ii)†	Certification of Principal Financial Officer required by Rule 13a-14(a) or Rule 15d-14(a) of the Exchange Act.
32††	Certifications of the Principal Executive Officer and Principal Financial Officer pursuant to 18 U.S.C. Section 1350.
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 Extension Definition Linkbase Document.
101.LAB†	XBRL Taxonomy Label Linkbase Document.
101.PRE†	XBRL Taxonomy Presentation Linkbase Document.
104*	The cover page from the Company's Annual Report on Form 10-K for the year ended September 30, 2019, formatted in Inline XBRL (included in Exhibit 101).

* Management contract or compensatory plan or arrangement.

† Filed herewith.

†† Furnished herewith.

Item 16. ***Form 10-K Summary***

None.

SIGNATURES

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

CABOT CORPORATION

BY: /s/ SEAN D. KEOHANE

Sean D. Keohane
President and Chief Executive Officer

Date: November 22, 2019

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

Signatures	Title	Date
/s/ SEAN D. KEOHANE Sean D. Keohane	Director, President and Chief Executive Officer	November 22, 2019
/s/ ERICA MCLAUGHLIN Erica McLaughlin	Senior Vice President and Chief Financial Officer (principal financial officer)	November 22, 2019
/s/ JAMES P. KELLY James P. Kelly	Vice President and Controller (principal accounting officer)	November 22, 2019
/s/ SUE H. RATAJ Sue H. Rataj	Director, Non-Executive Chair of the Board	November 22, 2019
/s/ CYNTHIA A. ARNOLD Cynthia A. Arnold	Director	November 22, 2019
Juan Enriquez	Director	
/s/ WILLIAM C. KIRBY William C. Kirby	Director	November 22, 2019
/s/ MICHAEL M. MORROW Michael M. Morrow	Director	November 22, 2019
/s/ JOHN F. O’BRIEN John F. O’Brien	Director	November 22, 2019
/s/ PATRICK M. PREVOST Patrick M. Prevost	Director	November 22, 2019
/s/ FRANK A. WILSON Frank A. Wilson	Director	November 22, 2019
/s/ MATTHIAS L. WOLFGRUBER Matthias L. Wolfgruber	Director	November 22, 2019
/s/ MARK S. WRIGHTON Mark S. Wrighton	Director	November 22, 2019
/s/ CHRISTINE Y. YAN Christine Y. Yan	Director	November 22, 2019

Exhibit 31(i)

Principal Executive Officer Certification

I, Sean D. Keohane, certify that:

1. I have reviewed this annual report on Form 10-K of Cabot Corporation;

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

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

4. The registrant's other certifying officer(s) 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(s) 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: November 22, 2019

/s/ SEAN D. KEOHANE

Sean D. Keohane
President and
Chief Executive Officer

Exhibit 31(ii)

Principal Financial Officer Certification

I, Erica McLaughlin, certify that:

1. I have reviewed this annual report on Form 10-K of Cabot Corporation;

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

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

4. The registrant's other certifying officer(s) 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(s) 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: November 22, 2019

/s/ ERICA MCLAUGHLIN

Erica McLaughlin
Senior Vice President and
Chief Financial Officer

Exhibit 32

Certifications Pursuant to 18 U.S.C. Section 1350,
as Adopted Pursuant to Section 906 of the
Sarbanes-Oxley Act of 2002

In connection with the filing of the Annual Report on Form 10-K for the year ended September 30, 2019 (the "Report") by Cabot Corporation (the "Company"), each of the undersigned hereby certifies pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to his knowledge:

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

November 22, 2019

/s/ SEAN D. KEOHANE

Sean D. Keohane
President and
Chief Executive Officer

November 22, 2019

/s/ ERICA MCLAUGHLIN

Erica McLaughlin
Senior Vice President and
Chief Financial Officer

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CORPORATE HEADQUARTERS

Cabot Corporation
Two Seaport Lane, Suite 1300
Boston, Massachusetts 02210-2019
617 345 0100

Investor Relations

Investor inquiries are welcome and individuals are invited to contact us through our investor website at **cabotcorp.com/investors** or by telephone at 617 342 6255.

Stock Listing

Cabot Corporation common stock is listed on the New York Stock Exchange under the symbol CBT.

Annual Meeting

The Annual Meeting of Stockholders will be held on Thursday, March 12, 2020 at 4:00 p.m. ET, at the company's corporate headquarters at Two Seaport Lane, Boston, Massachusetts. All stockholders are invited to attend.

Stock Transfer Agent and Registrar

Registered shareholders may contact the transfer agent by Internet or by phone for information or assistance with receiving proxy materials electronically by internet, transfers of stock ownership, direct deposit of dividend payments, dividend check replacements, account history, lost stock certificates, taxable income or to report address changes. The transfer agent provides telephone assistance Monday through Friday, 9:00 a.m. to 5:00 p.m. ET. Extended service is available 24 hours a day, seven days a week to callers with touch-tone telephones through the transfer agent's Interactive Voice Response System.

When using the IVR system, mention Cabot Corporation as your stock holding and be prepared to provide your name, Social Security number, if applicable, or your Computershare account number. Please include your address and telephone number in all correspondence with the transfer agent.

Computershare Trust Company, N.A.
c/o Computershare
P.O. Box 505000
Louisville, KY 40233

Overnight correspondence should be sent to:
Computershare
462 South 4th Street, Suite 1600
Louisville, KY 40202

Stockholder Inquiries: 781 575 3170 or 800 730 4001

For the hearing impaired: 800 952 9245 (TTY/TDD)

Stockholder Website: **computershare.com/investor**
Click on "Contact Us" link at the top or bottom of the webpage for online stockholder inquiries.

For more information about Cabot Corporation and our businesses, please visit our website at: cabotcorp.com

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