

APTARGROUP INC
Form 10-K
February 21, 2019
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United States Securities and Exchange Commission

Washington, D.C. 20549

FORM 10 K

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

FOR THE FISCAL YEAR ENDED DECEMBER 31, 2018

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 11846

AptarGroup, Inc.

DELAWARE 36 3853103

265 EXCHANGE DRIVE, SUITE 100, CRYSTAL LAKE, ILLINOIS 60014

815 477 0424

Securities Registered Pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Common Stock \$.01 par value	New York Stock Exchange

Securities Registered Pursuant to Section 12 (g) of the Act:

NONE

Indicate by check mark if the registrant is a well known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes No

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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 if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

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

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act).

Yes No

The aggregate market value of the common stock held by non-affiliates as of June 29, 2018 was \$5,819,010,091.

The number of shares outstanding of common stock, as of February 15, 2019, was 62,930,726 shares.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive Proxy Statement to be delivered to stockholders in connection with the Annual Meeting of Stockholders to be held May 1, 2019 are incorporated by reference into Part III of this report.

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PART I

ITEM 1. BUSINESS

WHO ARE WE AND WHAT DO WE DO

Aptar is a leading global supplier of a broad range of innovative dispensing, sealing and active packaging solutions for the beauty, personal care, home care, prescription drug, consumer health care, injectables, food and beverage markets. Aptar uses insights, design, engineering and science to create innovative packaging technologies that build brand value for its customers, and, in turn, make a meaningful difference in the lives, looks, health and homes of people around the world. Aptar is headquartered in Crystal Lake, Illinois and has over 14,000 dedicated employees in 18 different countries. For more information, visit www.aptar.com.

Our business was started in the late 1940's, manufacturing and selling aerosol valves in the United States, and has grown primarily through acquisitions and internal expansion. We were incorporated in Delaware in 1992. In this report, we may refer to AptarGroup, Inc. and its subsidiaries as "AptarGroup", "Aptar" or the "Company".

We have manufacturing facilities located throughout the world including North America, Europe, Asia and South America. We have approximately 5,000 customers with no single customer or group of affiliated customers accounting for greater than 6% of our 2018 Net Sales.

Consumers' preference for convenience and product differentiation through packaging design and function are important to our customers and they have converted many of their packages from non-dispensing formats to dispensing systems that offer enhanced shelf appeal, convenience, cleanliness and accuracy of dosage.

While we offer a wide variety of dispensing, sealing and active packaging solutions, our primary products are dispensing pumps, closures, aerosol valves and elastomeric primary packaging components.

Dispensing pumps are finger actuated dispensing systems that dispense a spray or lotion from non pressurized containers. The style of pump used depends largely on the nature of the product being dispensed, from small, fine mist pumps used with perfume and pharmaceutical products to lotion pumps for more viscous formulas.

Closures are primarily dispensing closures but to a lesser degree can include non dispensing closures. Dispensing closures are plastic caps that allow a product to be dispensed without removing the cap.

Aerosol valves dispense product from pressurized containers. The majority of the aerosol valves that we sell are continuous spray valves, with the balance being metered dose valves.

We also manufacture and sell elastomeric primary packaging components. These components are used in the injectables market. Products include stoppers for infusion, antibiotic, lyophilization and diagnostic vials. Our elastomeric components also include pre filled syringe components, such as plungers, needle shields, tip caps and cartridges, as well as dropper bulbs and syringe plungers.

On August 27, 2018, the Company completed its acquisition (the "CSP Technologies Acquisition") of all of the outstanding capital stock of CSP Technologies S.à r.l. ("CSP Technologies"). CSP Technologies is a leader in active packaging technology based on proprietary material science expertise for the pharma and food service markets. The active packaging technologies protect and enhance the performance of our customers' products. On May 1, 2018, we acquired 100% of the common stock of Reboul SAS ("Reboul"). Reboul is a French manufacturer specializing in stamping, decorating and assembling metal and plastic packaging for the cosmetics and luxury markets.

AVAILABLE INFORMATION

Our periodic and current reports, and any amendments to those reports, are available, free of charge, through a link on the Investors page of our website (www.aptar.com), as soon as reasonably practicable after the material is electronically filed with, or furnished to, the Securities and Exchange Commission (“SEC”). These filings are also available to the public over the Internet at the SEC’s website (<http://www.sec.gov>).

Also posted on our website are the charters for our Audit, Management Development and Compensation, Governance and Executive Committees, our Governance Principles, our Code of Business Conduct & Ethics, our Director Independence Standards and our Conflict Minerals Statement. Within the time period required by the SEC and the New York Stock Exchange (“NYSE”), we will post on our website any amendment or waiver to the Code of Business Conduct & Ethics applicable to any executive officer or director. The information provided on our website is not part of this report and is therefore not incorporated herein by reference.

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OUR STRATEGY

We seek to enhance our position as a leading global provider of innovative packaging dispensing, sealing and active packaging solutions and deliver increased value to our customers and stockholders through strategic focus and execution in the following areas:

- (i) **Successful Transformation:** To strengthen our performance and deepen our position as a true market shaper, we continually evaluate our business. In late 2017, we launched a comprehensive business transformation plan within our Beauty + Home segment and for key corporate support functions including Finance, Human Resources, Information Systems and Purchasing.
- (ii) **Focus on Organic Growth:** We are focused on accelerating our top line growth with added emphasis on high growth economies. Accordingly, we are creating empowered, regional, cross-functional profit and loss (“P&L”) teams who are fully accountable to drive profitable growth.
- (iii) **Excellence in Core Business Functions:** We have established three pillars of functional excellence to ensure we perform at best in class levels in the core functions of any manufacturing business, namely “innovate,” “produce” and “sell,” and that our business teams are supported in the areas of Innovation, Operations and Commercial Excellence.
- (iv) **Focus on Talent and Leadership:** Execution of our strategy requires a talented, motivated, diverse, international team. We have a focused talent acquisition and development strategy to ensure our teams have the right skills to execute our strategy.
- (v) **Partnerships and Acquisitions:** We will continue to focus on growing the company through appropriate business acquisition opportunities as well as developing partnerships to expand the scope of our technologies, geographic presence and product offerings.

Facilitating the execution of our strategy are our core values, which dictate how we interact internally and externally with our employees, customers, suppliers and all stakeholders.

DESCRIPTION OF OUR REPORTING SEGMENTS

INFORMATION ABOUT SEGMENTS

Our organizational structure consists of three market focused business segments: Beauty + Home, Pharma and Food + Beverage. This is a strategic structure which allows us to be more closely aligned with our customers and the markets in which they operate. We primarily sell our products through our own sales force to beauty, personal care, pharmaceutical, home care, food and beverage marketers. To a limited extent, we use independent representatives and distributors to increase our reach to smaller customers and export markets.

Operations that sell dispensing systems and sealing solutions primarily to the beauty, personal care and home care markets form the Beauty + Home segment. Operations that sell dispensing systems and sealing solutions to the prescription drug, consumer health care, injectables and active packaging markets form the Pharma segment. Operations that sell dispensing systems and sealing solutions to the food and beverage markets form the Food + Beverage segment. Each of these three business segments is described more fully below.

BEAUTY + HOME

The Beauty + Home segment is our largest segment in terms of net sales and total assets representing 52% and 41% of our Net Sales and Total Assets, respectively, in 2018. The Beauty + Home segment primarily sells pumps, closures, aerosol valves, accessories and sealing solutions to the personal care and home care markets and pumps and decorative components to the beauty market. We believe we are a leading supplier for the majority of the products we sell primarily to the beauty and personal care markets.

Beauty. Sales to the beauty market accounted for approximately 49% of the segment's total net sales in 2018. The beauty market requires a broad range of spray and lotion pumps, closures, elastomeric flow-control components and sampling dispensing systems to meet functional as well as aesthetic requirements. A considerable amount of research, time and coordination with our customers is required to qualify a pump for use with their products. Within the market, we expect the use of pumps to continue to increase, particularly in the cosmetics and sampling sectors. In the cosmetic sector, packaging for certain products such as natural and organic cosmetics and anti aging lotions continue to provide us with growth opportunities. We are a leading provider of packaging solutions for prestige and mass market fragrance products. Our cosmetic lotion pumps, airless dispensing systems, lotion sampling devices and decorative capabilities along with our focus on color cosmetics including lip stick and lip gloss products will also provide growth opportunities. We see continued growth opportunities in Latin America and significant opportunities for growth in the sale of our products for cosmetic applications in Asia.

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Personal Care. Sales to the personal care market accounted for approximately 44% of the segment's total net sales in 2018 and primarily included sales of fine mist spray pumps, lotion pumps, closures, elastomeric flow-control components and continuous spray aerosol valves. Personal care spray pump applications include hair care, body care and sun care products. Typical lotion pump applications include skin moisturizers, hand sanitizers and soap. Personal care closures applications include shampoos and conditioners. Personal care continuous spray aerosol valve applications include hair care products, deodorants, shaving creams and sun care products. Our research and development teams continue to design unique accessories that increase the value of our continuous spray aerosol valve offerings.

Home Care. Sales to the home care market accounted for approximately 7% of the segment's total net sales in 2018 and primarily included sales of continuous or metered dose spray aerosol valves, closures and to a lesser degree spray and lotion pumps. Applications for continuous spray valves include disinfectants, spray paints, insecticides and automotive products. Metered dose valves are used for air fresheners. Closure applications include liquid detergents, automotive products and household cleansers. Spray and lotion pump applications primarily include household, insect repellent and industrial cleaners.

PHARMA

The Pharma segment is our second largest segment in terms of net sales and total assets, accounting for 34% and 40% of our Net Sales and Total Assets, respectively, in 2018. We believe we are a leading supplier of pumps and metered dose inhaler valves ("MDIs") to the pharmaceutical market worldwide and we are an important supplier of elastomer for injectable primary packaging components worldwide. Characteristics of this market include (i) governmental regulation of our pharmaceutical customers, (ii) contaminant controlled manufacturing environments and (iii) a significant amount of time and research from initially working with pharmaceutical companies at the molecular development stage of a medication through the eventual distribution to the market. We have clean room manufacturing facilities in Argentina, China, France, Germany, India, Switzerland and the United States. We believe that providing an alternative to traditional medication forms such as pills with value added, convenient dispensing systems will continue to offer opportunities for our business. In addition, we believe there are opportunities for growth in the over-the-counter and generic pharmaceutical categories.

Prescription Drug. Sales to the prescription drug market accounted for approximately 52% of the segment's total net sales in 2018. Pumps sold to the prescription drug market deliver medications nasally, orally or topically. Currently the majority of our pumps sold are for nasal allergy treatments. Recently, there is a trend of nasal allergy products moving from prescription only to being sold over-the-counter without a prescription. This trend could provide us with growth opportunities as this movement could allow consumers easier access to these types of treatments. Our nasal pumps and unit dose devices are also used to deliver pain management products. Potential opportunities for providing alternatives to traditional pill and injectable dosage forms of medication include pump dispensing systems for vaccines, cold and flu treatments, central nervous systems applications and hormone replacement therapies.

MDIs are used for dispensing precise amounts of aerosolized medication. This technology allows medication to be broken up into very fine particles, which enables the drug to be delivered typically via the pulmonary system. Currently the majority of our MDIs sold are used for respiratory ailments such as asthma and COPD (chronic obstructive pulmonary disease).

We continue to develop new dispensing systems and accessories in this segment. For example, we provide single dose delivery devices suitable for central nervous system applications. While we expect that these types of new products will come to market in the future, it is difficult to estimate when, as the rigors of pharmaceutical regulations affect the timing of product introductions by our pharmaceutical customers that use our dispensing systems.

Consumer Health Care. Sales to the consumer health care market accounted for approximately 27% of the segment's total net sales in 2018. Applications for this market are similar to the prescription market; however, these applications are sold over-the-counter without a prescription. Typical consumer health care spray pump applications include nasal decongestants, nasal salines and cough and cold applications. Typical consumer health care valve applications include nasal saline using our bag on valve technology. We have developed a multi dose ophthalmic dispensing device suitable for unpreserved formulations. This technology is successfully marketed in Europe, North America and Latin America and is under development for other markets both for over-the-counter and prescription applications. Other products sold to this market include airless pump systems for dermal drug delivery applications. We have recently seen a trend to more child resistant and senior friendly packaging solutions and have developed products to meet these market needs.

Injectables. Sales to the injectables market accounted for approximately 17% of the segment's total net sales in 2018. Injectables are elastomeric primary packaging components for injectable drug delivery. Injectable products offered include stoppers for vials and pre filled syringe components, such as plungers, needle shields, tip caps and components for cartridges. Our recent investment in this business allows us to market coated stoppers which better preserve the contents of the vial and adds value to our customers and the consumer. Pharmaceutical applications for this market include vaccines, anti thrombotic, small molecules and biologics.

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Active Packaging. Active packaging is a new technology for Aptar since the CSP Technologies Acquisition in the third quarter of 2018. Sales of active packaging products accounted for approximately 4% of the segment's total net sales in 2018 since acquisition. Through proprietary material science expertise, we deliver active packaging solutions such as desiccant material to enhance the shelf life and effectiveness of diagnostic and solid dose products.

FOOD + BEVERAGE

The Food + Beverage segment is our smallest segment in terms of net sales and total assets representing 14% of our Net Sales and Total Assets in 2018, but has been experiencing strong product growth over recent years. We primarily sell dispensing closures and, to a lesser degree, non dispensing closures, elastomeric flow control components, spray pumps and aerosol valves.

Sales of dispensing closures have grown as consumers worldwide have demonstrated a preference for a package utilizing the convenience of a dispensing closure. At the same time, consumer marketers are trying to differentiate their products by incorporating performance enhancing features such as bonded aluminum liners to plastic, flow control and no drip dispensing, inverted packaging and directional flow to make packages simpler to use, cleaner and more appealing to consumers. We also have a number of product solutions that address the increased use of flexible packaging formats.

Food. Sales to the food market accounted for approximately 64% of the segment's total net sales in 2018 and primarily include sales of dispensing closures and elastomeric flow control components. To a lesser degree we also sell non dispensing closures, continuous spray aerosol valves and spray pumps to this market. Applications for dispensing closures include sauces, condiments, infant nutrition and other food products. Applications for continuous spray aerosol valves include cooking sprays. Spray pump applications primarily include butter or salad dressing sprays. With the completion of the CSP Technologies Acquisition in the third quarter of 2018, we have started to sell and further develop packaging solutions to the food service market to enhance the shelf life of those products.

Beverage. Sales to the beverage market accounted for approximately 36% of the segment's total net sales in 2018 and primarily include sales of dispensing closures and elastomeric flow control components. Sales of dispensing closures to the beverage market have increased significantly over the last several years as we continue to see an increase of interest from marketers using dispensing closures for their products. Examples of beverage products currently utilizing dispensing closures include bottled water, sport and energy drinks, juices and concentrated water flavorings.

GENERAL BUSINESS INFORMATION

RESEARCH AND DEVELOPMENT

Our commitment to innovation, one of our competitive strengths, has resulted in an emphasis on research and development directed toward developing affordable, new, innovative packaging delivery solutions and adapting existing products for new markets or customer requirements. In certain cases, our customers share in the research and development expenses of customer initiated projects. Occasionally, we acquire or license from third parties technologies or products that are in various stages of development.

PATENTS AND TRADEMARKS

We customarily seek patent and trademark protection for our products and brands. We own and currently have numerous applications pending for patents and trademarks in many regions of the world. In addition, certain of our products are produced under patent licenses granted by third parties. We believe that we possess certain technical capabilities in making our products that make it difficult for a competitor to duplicate. While valuable to our overall

product portfolio, sales of any one individually patented product are not considered material to any specific segment or to our consolidated results.

TECHNOLOGY

We have technical expertise regarding injection molding, robotics, clean-room facilities and high speed assembly. We also have expertise regarding the formulation and finishing of elastomer and silicone components. In addition, we offer a variety of sterilization options for elastomeric components and active packaging technology based on proprietary material science expertise. Pumps and aerosol valves require the assembly of several different plastic, metal and rubber components using high speed equipment. When molding dispensing closures, or plastic components to be used in pump or aerosol valve products, we use advanced plastic injection molding technology, including large cavitation plastic injection molds. We are able to mold within tolerances as small as one one thousandth of an inch and we assemble products in a high speed, cost effective manner. We are experts in molding liquid silicone that is used in certain dispensing closures as well as rubber gasket formulation and production primarily for the prescription drug and consumer health care markets.

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MANUFACTURING AND SOURCING

The majority of our worldwide production is located outside of the United States. Our philosophy is to produce as much as possible in the region where it will be sold. In order to augment capacity and to maximize internal capacity utilization (particularly for plastic injection molding), we use subcontractors to supply certain plastic, metal and rubber components. Certain suppliers of these components have unique technical abilities that make us dependent on them, particularly for aerosol valve and pump production. The principal raw materials used in our production are plastic resins, silicone, rubber and certain metal products. We believe an adequate supply of such raw materials is available from existing and alternative sources. We attempt to offset cost increases through improving productivity and developing new, higher margin solutions and increasing selling prices, as allowed by market conditions or contractual commitments. We source certain materials, especially some resins and rubber components for our pharmaceutical segment, from a single source. Significant delays in receiving these components or discontinuance of an approved raw material would require us to seek alternative sources, which could result in higher costs as well as impact our ability to supply products in the short-term.

BACKLOG

Our sales are primarily made pursuant to standard purchase orders for delivery of products. While most orders placed with us are ready for delivery within 120 days, we continue to experience a trend towards shorter lead times requested by our customers. Some customers place blanket orders, which extend beyond this delivery period. However, deliveries against purchase orders are subject to change, and only a small portion of the order backlog is noncancelable. The dollar amount associated with the noncancelable portion is not material. Therefore, we do not believe that backlog as of any particular date is an accurate indicator of future results.

CUSTOMERS

We have approximately 5,000 customers with no single customer or group of affiliated customers accounting for greater than 6% of 2018 Net Sales. A consolidation of our customer base has been occurring and this trend is expected to continue. A concentration of customers presents opportunities for increasing sales due to the breadth of our product line, our international presence and our long term relationships with certain customers. However, consolidation of our customers could lead to pricing pressures, concentration of credit risk and fewer opportunities to introduce new products to the market.

INTERNATIONAL BUSINESS

We are geographically diverse with manufacturing and sales operations in Asia, Europe, Latin America (including Mexico) and North America. Europe is our largest region in terms of sales, where sales for the years ended December 31, 2018, 2017 and 2016 were approximately 59%, 58% and 57%, respectively, of our consolidated sales. Asia and Latin America when aggregated represented approximately 15%, 16% and 16% of our consolidated sales for the years ended December 31, 2018, 2017 and 2016, respectively. Export sales from the United States were \$171.7 million, \$152.8 million and \$165.1 million in 2018, 2017 and 2016, respectively. We are a net exporter of goods from the U.S. and Europe and a net importer of goods to the Asian and Latin American regions.

FOREIGN CURRENCY

Because of our international presence, movements in exchange rates have a significant impact on the translation of the financial statements of our foreign subsidiaries. Our primary foreign exchange exposure is to the euro, but we have foreign exchange exposure to the Chinese yuan, Brazilian real, Mexican peso, Swiss franc and other Asian, European and South American currencies. A weakening U.S. dollar relative to foreign currencies has an additive translation

effect on our financial statements. Conversely, a strengthening U.S. dollar has a dilutive effect. We manage our exposures to foreign exchange principally with forward exchange contracts to economically hedge recorded transactions and firm purchase and sales commitments denominated in foreign currencies.

During the quarter ended June 30, 2018, we concluded that Argentina has become a highly inflationary economy primarily based on published estimates, which indicate that Argentina's three-year cumulative inflation rate has exceeded 100%. Beginning July 1, 2018, we applied highly inflationary accounting for our Argentinian subsidiaries. We have changed the functional currency from the Argentinian peso to the U.S. dollar.

WORKING CAPITAL PRACTICES

Collection and payment periods tend to be longer for our operations located outside the United States due to local business practices. We have also seen an increasing trend in pressure from certain customers to lengthen their payment terms. As the majority of our products are made to order, we have not needed to keep significant amounts of finished goods inventory to meet customer requirements. However, some of our contracts specify an amount of finished goods safety stock we are required to maintain.

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To the extent our financial position allows and there is a clear financial benefit, we from time-to-time benefit from early payment discounts with some suppliers.

EMPLOYEE AND LABOR RELATIONS

AptarGroup has approximately 14,100 full time employees. Of the full time employees, approximately 8,700 are located in Europe, 3,000 are located in Asia and South America and the remaining 2,400 are located in North America. The majority of our European and Latin American employees are covered by collective bargaining arrangements made at either the local or national level in their respective countries and approximately 130 of the North American employees are covered by a collective bargaining agreement. Termination of employees at certain of our international operations could be costly due to local regulations regarding severance benefits. There were no material work stoppages in 2018 and management considers our employee relations to be satisfactory.

COMPETITION

All of the markets in which we operate are highly competitive and we continue to experience price competition in all product lines and markets. Competitors include privately and publicly held entities that range from regional to international companies. We expect the market for our products to remain competitive. We believe our competitive advantages are consistent high levels of innovation, quality and service, geographic diversity, financial strength and stability and breadth of products. Our manufacturing strength lies in the ability to mold complex plastic components and formulate and finish elastomer and silicone components in a cost effective manner and to assemble products at high speeds. Our business is somewhat capital intensive and it is becoming more important to our customers that we have global manufacturing capabilities. Both of these serve as barriers to entry for new competitors wanting to enter our business.

While we have experienced some competition in Europe, Latin America and the United States from low cost Asian suppliers, particularly in the low end beauty and personal care market, this has not been significant. Although using low cost Asian suppliers may have a cost advantage, some customers prefer local suppliers citing better quality, better customer service and shorter lead times.

ENVIRONMENT

Our manufacturing operations primarily involve plastic injection molding, automated assembly processes, elastomer and silicone formulation and finishing and, to a limited degree, metal anodization and vacuum metallization of plastic components. Historically, the environmental impact of these processes has been minimal, and we believe we meet current environmental standards in all material respects. To date, our manufacturing operations have not been significantly affected by environmental laws and regulations relating to the environment.

Recently there is increased interest and awareness from consumers, and from our customers, in environmentally sustainable products, especially through the sourcing of sustainable materials. We are focused on reducing our environmental impacts through product life cycle assessments, sustainable material trials, operational eco-efficiency initiatives and renewable energy sourcing. We have teams dedicated to designing for sustainability by providing products that improve recyclability and use less material. Aptar has launched products and components in North America and Europe made with post-consumer recycled resins (PCR) and continues to explore additional opportunities for alternative resins and recyclable products.

Connecting with other companies through organizations like Ellen MacArthur Foundation's New Plastics Economy and the World Business Council for Sustainable Development (WBCSD) provides an invaluable opportunity to share best practices and work on larger projects with aligned objectives.

Future regulations on environmental matters regarding recycling or material inputs could impact our business.

GOVERNMENT REGULATION

Certain of our products are indirectly affected by government regulation. The European Union has passed regulations aimed to reduce marine litter and increase plastic recycling rates. These regulations include the ban of single-use plastics by 2021 and the collection and recycling of more plastics post-consumer use. In some of the United States, regulations oblige food and beverage companies to tether plastic caps to ensure the caps stay with the package, thus improving the likelihood the caps will enter the recycling stream. The potential exists for these types of regulations to expand worldwide. We have established an innovation team that focuses on designing for and converting into more sustainable options like post-consumer recycled resin and Food and Drug Administration approved resin alternatives. We are designing for sustainability by providing products that improve recyclability and use less material, and we offer multiple tethered options. We are also partnering with global and regional thought leaders to drive a more circular economy.

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Demand for aerosol and pump packaging is also affected by government regulations regarding the release of volatile organic compounds (“VOCs”) into the atmosphere. Europe and the United States have regulations that require the reduction in the amount of VOCs that can be released into the atmosphere and the potential exists for this type of regulation to expand worldwide. These regulations required certain of our customers to reformulate certain aerosol and pump products, which may have affected the demand for such products. We own patents and have developed systems to function with alternative propellant and product formulations.

Future government regulations could include healthcare cost containment policies. For example, reviews by various governments to determine the number of drugs, or prices thereof, that will be paid by their insurance systems could affect future sales of our pharmaceutical customers’ products and thus adversely impact our sales to these customers. Such regulation could adversely affect prices of and demand for our pharmaceutical products. We believe that the focus on the cost effectiveness of the use of medications as compared to surgery and hospitalization provides us with an opportunity to expand sales to the pharmaceutical market.

EXECUTIVE OFFICERS

Our executive officers as of February 21, 2019 are as follows:

Name	Age	Position with the Company
Stephan Tanda	53	President and Chief Executive Officer Mr. Tanda has been President and Chief Executive Officer since February 2017. Prior to this, Mr. Tanda was an Executive Managing Board Director at Royal DSM NV, a leading global supplier of ingredients and material solutions for the food, dietary supplement, personal care, medical device, automotive, paint, electronic and bio-material markets, from March 2007 to January 2017.
Robert Kuhn	56	Executive Vice President, Chief Financial Officer and Secretary Mr. Kuhn has been Executive Vice President and Chief Financial Officer since September 2008. Mr. Kuhn has been Secretary since June 2011.
Eldon Schaffer	53	President, Aptar Beauty + Home Mr. Schaffer has been President of Aptar Beauty + Home since January 2016. Prior to this, Mr. Schaffer was President of Aptar Food + Beverage from 2012 to 2015 and President of Aptar Beauty + Home North America from 2010 to 2011.
Marc Prieur	53	President, Aptar Food + Beverage Mr. Prieur has been President of Aptar Food + Beverage since September 2018. Prior to this, Mr. Prieur was VP of Aptar Operational Excellence from June 2017 to August 2018, President EMEA Sales & Operations – Consumer Health Care from June 2013 to June 2017 and President of our Pharma business in Asia from June 2008 to June 2013.
Gael Touya	49	President, Aptar Pharma Mr. Touya has been President of Aptar Pharma since September 2018. Prior to this, Mr. Touya was President of Aptar Food + Beverage from 2016 to August 2018, President of Aptar Food + Beverage Europe from 2012 to 2015 and Business Development Vice President Skin Care and Color Cosmetics from 2010 to 2011.

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Xiangwei Gong 49 President, Aptar Asia

Ms. Gong has been President of Aptar Asia since October 2018. Prior to this, Ms. Gong held various leadership positions at Royal DSM for over 22 years. She was President of DSM Hydrocolloids from 2014 to 2018, President Asia of DSM Food Specialties from 2011 to 2014, Vice President of Channel Marketing from 2008 to 2011 and Vice President of Personal Care in DSM North America from 2005 to 2008.

Shiela Vinczeller 55 Chief Human Resources Officer

Ms. Vinczeller has been Chief Human Resources Officer since November 2018. Prior to this, Ms. Vinczeller spent 12 years in Human Resources leadership roles at International Paper, one of the world's leading producers of fiber-based packaging, pulp and paper.

There were no arrangements or understandings between any of the executive officers and any other person(s) pursuant to which such officers were elected.

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ITEM 1A. RISK FACTORS

Set forth below and elsewhere in this report and in other documents we file with the Securities and Exchange Commission are risks and uncertainties that could cause our actual results to materially differ from the results contemplated by the forward looking statements contained in this report and in other documents we file with the Securities and Exchange Commission. Additional risks and uncertainties not presently known to us, or that we currently deem immaterial, may also impair our business operations. You should carefully consider the following factors in addition to other information contained in this report on Form 10 K before purchasing any shares of our common stock.

If there is deterioration in economic conditions in a particular region or market, our business and operating results could be materially adversely impacted. Due to our strong balance sheet, diverse product offerings, various end markets served, and our broad geographic presence, we believe we are well positioned to withstand slowness in any one particular region or market. However, economic uncertainties affect businesses such as ours in a number of ways, making it difficult to accurately forecast and plan our future business activities. A tightening of credit in financial markets or other factors may lead consumers and businesses to postpone spending, which may cause our customers to cancel, decrease or delay their existing and future orders with us. In addition, financial difficulties experienced by our suppliers, customers or distributors could result in product delays, increased accounts receivable defaults, inventory or supply challenges and pricing pressures. An interruption in supply may also impact our ability to meet customer demands. Consumer demand for our customers' products and shifting consumer preferences are unpredictable and could have a negative impact on our customers and our customers' demand for our products.

We face strong global competition and our market share could decline. All of the markets in which we operate are highly competitive and we continue to experience price competition in all product lines and segments. Competitors include privately and publicly held entities. Our competitors mainly range from regional to international companies. If we are unable to compete successfully, our market share may decline, which could materially adversely affect our results of operations and financial condition.

Geopolitical conditions, including trade disputes and direct or indirect acts of war or terrorism, could have a material adverse effect on our operations and financial results. Our operations could be disrupted by geopolitical conditions such as Brexit, trade disputes, international boycotts and sanctions, acts of war, terrorist activity or other similar events. Such events could make it difficult, impossible or more expensive to manufacture or deliver products to our customers, receive production materials from our suppliers, or perform critical functions, all of which could adversely affect our business globally or in certain regions. In addition, our customers may export their finished products using our dispensing devices that were sold in other regions and an adverse geopolitical event may impact the sales of our customers' products and thus indirectly negatively impact the demand for our dispensing solutions. However, our business is well-diversified across eight end markets and many geographies as we produce in eighteen countries and while we do face some risk related to specific trade policies, we believe our diverse business model, coupled with our diverse and global customer base, allow some protection from dependency on any one geographic region, country or even trade route.

We have foreign currency translation and transaction risks that may materially adversely affect our operating results. A majority of our operations are located outside of the United States. Because of this, movements in exchange rates may have an impact on the translation of the financial statements of our foreign entities. Our primary foreign exchange exposure is to the euro, but we have foreign exchange exposure to the Chinese yuan, Brazilian real, Mexican peso, Swiss franc, and other Asian, European and South American currencies. A weakening U.S. dollar relative to foreign currencies has an additive translation effect on our financial statements. Conversely, a strengthening U.S. dollar has a dilutive translation effect. In some cases, we sell products denominated in a currency different from the currency in which the related costs are incurred. We manage our exposures to foreign exchange principally with

forward exchange contracts to economically hedge certain transactions and firm purchase and sales commitments denominated in foreign currencies. The volatility of currency exchange rates may materially affect our operating results.

Government regulation on environmental matters regarding recycling or environmental sustainability policies could impact our business. Future government regulations mandating the use or limitations of certain materials could impact our manufacturing processes or the technologies we use forcing faster development and adoption of alternative materials or assets used in the production of our products.

Future government regulations of healthcare cost containment policies may impact our pharmaceutical sales. Review by governments of the number of drugs and prices thereof that will be paid by their insurance systems could affect future sales to the pharmaceutical industry and thereby adversely affect prices of and demand for our pharmaceutical products.

Consolidation of customer base could impact our business. We believe mergers and acquisitions within our customer base create opportunities for increasing sales due to the breadth of our product line, our international presence and our long term relationships with certain customers. However, consolidation of our customers could lead to pricing pressures, concentration of credit risk and fewer opportunities to introduce new products to the market.

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If our expansion initiatives are unsuccessful, our operating results and reputation may suffer. We are expanding our operations in a number of geographies and markets, including facilities expansions in Latin America and Asia, and market expansions such as active packaging. Expansion of our operations require a significant amount of time and attention from our senior management and/or capital investment. These activities present considerable challenges and risks, including the general economic and political conditions in the markets that we enter, attracting, training and retaining qualified and talented employees, infrastructure disruptions, fluctuations in currency exchange rates, the imposition of restrictions by governmental authorities, compliance with current, new and changing governmental laws and regulations and the cost of such compliance activities. If any of our expansion efforts are unsuccessful, our operating results and reputation may suffer.

The success or failure of our customers' products, particularly in the pharmaceutical market, may materially affect our operating results and financial condition. In the pharmaceutical market, the proprietary nature of our customers' products and the success or failure of their products in the market using our dispensing systems may have a material impact on our operating results and financial condition. We may potentially work for years on modifying our dispensing device to work in conjunction with a customer's drug formulation. If the customer's pharmaceutical product is not approved by regulatory bodies or it is not successful on the market, the associated costs may not be recovered.

Higher raw material costs and other inputs and an inability to increase our selling prices may materially adversely affect our operating results and financial condition. The cost of raw materials and other inputs (particularly plastic resin, rubber, metal, anodization costs and transportation and energy costs) are volatile and susceptible to rapid and substantial changes due to factors beyond our control, such as changing economic conditions, currency fluctuations, weather conditions, political unrest and instability in energy producing nations, and supply and demand pressures. Raw material costs may increase in the coming years and, although we have generally been able to increase selling prices to cover increased costs, future market conditions may prevent us from passing these increased costs on to our customers through timely price increases. In addition, we may not be able to improve productivity or realize savings from our cost reduction programs sufficiently enough to offset the impact of increased raw material costs. As a result, higher raw material costs could result in declining margins and operating results.

In difficult market conditions, our fixed costs structure combined with potentially lower revenues may negatively impact our results. Our business is characterized by relatively high fixed costs and, notwithstanding our utilization of third party manufacturing capacity, most of our production requirements are met by our own manufacturing facilities. In difficult environments, we are generally faced with a decline in the utilization rates of our manufacturing facilities due to decreases in product demand. During such periods, our plants may not operate at full capacity and the costs associated with this excess capacity are charged directly to cost of sales. Difficult market conditions in the future may adversely affect our utilization rates and consequently our future gross margins, and this, in turn, could have a material negative impact on our business, financial condition and results of operations.

If our unionized employees were to engage in a strike or other work stoppage, our business, operating results and financial position could be materially adversely affected. The majority of our European and Latin American employees are covered by collective bargaining arrangements made either at the local or national level in their respective countries and approximately 130 of our North American employees are covered by a collective bargaining agreement. Although we believe that our relations with our employees are satisfactory, no assurance can be given that this will continue. If disputes with our unions arise, or if our unionized workers engage in a strike or other work stoppage, we could incur higher labor costs or experience a significant disruption of operations, which could have a material adverse effect on our business, operating results and financial position.

Single sourced materials and manufacturing sites could adversely impact our ability to deliver product. The Company sources certain materials, especially some resins and rubber components for our pharmaceutical segment, from a single source. Any disruption in the supply of these materials could adversely impact our ability to deliver product to

our customers. Similarly, we have certain components and products that are manufactured at a single location or from a single machine or mold. Any disruption to the manufacturing process could also adversely impact our ability to deliver product to our customers.

If we were to incur a significant product liability claim above our current insurance coverage, our business, operating results and financial condition could be materially adversely affected. The failure of our devices to operate as intended may result in a product liability claim against us. We believe we maintain adequate levels of product liability insurance coverage. A product liability claim in excess of our insurance coverage or not covered by existing insurance may materially adversely affect our business, operating results and financial condition.

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Increased cybersecurity threats could pose a risk to our operations. Increased global information security threats and more sophisticated, targeted computer crime pose a risk to the confidentiality, availability and integrity of our data, operations and infrastructure, as well as the data of our customers. We continue to assess potential threats and make investments seeking to reduce the risk of these threats by employing a number of security measures, including employee training, comprehensive monitoring of our networks and systems, and maintenance of backup and protective systems. We also periodically test our systems for vulnerabilities and have on occasion used a third party to conduct such tests. To date, we have seen no material impact on our business or operations from these threats; however, we cannot guarantee that our security efforts will prevent unauthorized access or loss of functionality to our or our third-party providers' systems. Even with these mitigations, our information systems remain potentially vulnerable to sophisticated cybersecurity threats. Depending on their nature and scope, such threats could potentially lead to the compromise of confidential information, improper use of our systems and networks, manipulation and destruction of data, production downtimes and operational disruptions, which in turn could adversely affect our reputation, competitiveness and results of operations.

If our integration of acquisitions are unsuccessful, our operating results and reputation in the investment community may suffer. We continue to pursue growth through acquisitions, including the recent CSP Technologies and Rebound acquisitions. If our integration, including unlocking synergies, is unsuccessful we may not realize the full potential of the acquisitions and as a result our financial performance may suffer. Through our experience and outside advisors we think we minimize this risk both from a diligence and integration perspective.

We have approximately \$712.1 million in recorded goodwill at December 31, 2018, and changes in future business conditions could cause this asset to become impaired, requiring write downs that would reduce our operating income. We evaluate the recoverability of goodwill amounts annually, or more frequently when evidence of potential impairment exists. The impairment test is based on several factors requiring judgment. A decrease in expected reporting unit cash flows or changes in market conditions may indicate potential impairment of recorded goodwill and, as a result, our operating results could be materially adversely affected. See "Critical Accounting Estimates" in Part II, Item 7 for additional information.

We are subject to tax regulations in the many jurisdictions in which we operate, and changes in tax regulations could materially impact our results. Future changes in tax laws or in the interpretation of tax laws in jurisdictions where we have significant operations could materially impact our provision for income taxes, the amount of taxes payable and our deferred tax asset and liability balances.

We are currently implementing a business transformation plan, with the main objective to return our Beauty + Home segment to historical growth and profit margins. Certain elements of this transformation plan can be disruptive to our business and our employees if we do not manage the change properly. Furthermore, the transformation plan may take longer to complete than currently expected, may be more costly to complete than currently expected and may not be successful in returning Beauty + Home to historical growth and profit margins. Any such effects could materially adversely impact our business.

Ownership by Certain Significant Stockholders. Currently, Aptar has three institutional stockholders who each own between 8% and 11% of our outstanding common stock. None of these stockholders have direct representation on our Board of Directors. If one of these stockholders decides to sell significant volumes of our stock, this could put downward pressure on the price of the stock.

ITEM 1B. UNRESOLVED STAFF COMMENTS

The Company has no unresolved comments from the SEC.

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ITEM 2. PROPERTIES

We lease or own our principal offices and manufacturing facilities. None of the owned principal properties is subject to a lien or other encumbrance material to our operations. We believe that existing operating leases will be renegotiated as they expire, will be acquired through purchase options or that suitable alternative properties will be leased on acceptable terms. We consider the condition and extent of utilization of our manufacturing facilities and other properties to be generally good, and the capacity of our plants to be adequate for the needs of our business. The locations of our principal manufacturing facilities, by country, are set forth below:

ARGENTINA	GERMANY	SPAIN
Berazategui (1 & 2)	Böhringen (1 & 2)	Madrid (1)
Tortuguitas (1 & 3)	Dortmund (1)	Torello (1 & 3)
	Eigeltingen (2)	
BRAZIL	Freyung (1 & 3)	SWITZERLAND
Cajamar (1)	Menden (1)	Mezzovico (2)
Maringá Paraná (1 & 3)	Villingen-Schwenningen (1 & 2)	
Jundiai (1)		THAILAND
	INDIA	Chonburi (1)
CHINA	Himachal Pradesh (1)	
Suzhou (1, 2 & 3)	Hyderabad (1 & 3)	UNITED KINGDOM
	Mumbai (2)	Leeds, England (1 & 3)
COLOMBIA		
Cali (1)	INDONESIA	UNITED STATES
	Cikarang, Bekasi (1)	Atlanta, Georgia (3)
CZECH REPUBLIC		Auburn, Alabama (2 & 3)
Kyne (1 & 3)	IRELAND	Cary, Illinois (1, 2 & 3)
	Ballinasloe, County Galway (1)	Congers, New York (2)
FRANCE		Eatontown, New Jersey (1 & 2)
Annecy (1 & 2)	ITALY	Libertyville, Illinois (1 & 3)
Brecey (2)	Manoppello (1)	Lincolnton, North Carolina (3)
Charleval (1 & 2)	San Giovanni Teatino (Chieti) (1 & 3)	McHenry, Illinois (1 & 2)
Granville (2)		Midland, Michigan (1 & 3)
Le Neubourg (1)	MEXICO	Mukwonago, Wisconsin (1, 2 & 3)
Le Vaudreuil (2)	Queretaro (1 & 3)	Stratford, Connecticut (1)
Niederbronn-les-Bains (2)		Torrington, Connecticut (1)
Oyonnax (1)	RUSSIA	Watertown, Connecticut (1)
Poincy (1 & 3)	Vladimir (1 & 3)	
Verneuil Sur Avre (1)		

(1) Locations of facilities manufacturing for the Beauty + Home segment.

(2) Locations of facilities manufacturing for the Pharma segment.

(3) Locations of facilities manufacturing for the Food + Beverage segment.

We also have sales personnel in countries other than those listed above. Our corporate office is located in Crystal Lake, Illinois.

ITEM 3. LEGAL PROCEEDINGS

In the normal course of business, we are subject to a number of lawsuits and claims both actual and potential in nature. While management believes the resolution of these claims and lawsuits will not have a material adverse effect on our financial position or results of operations or cash flows, claims and legal proceedings are subject to inherent uncertainties, and unfavorable outcomes could occur that could include amounts in excess of any accruals which management has established. Were such unfavorable final outcomes to occur, it is possible that they could have a material adverse effect on our financial position, results of operations and cash flows.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

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PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

MARKET FOR REGISTRANT'S COMMON EQUITY

Our Common Stock is traded on the New York Stock Exchange under the symbol "ATR". As of February 15, 2019, there were approximately 200 holders of record of our Common Stock. A substantially greater number of holders of our Common Stock are "street name" or beneficial holders, whose shares of record are held by banks, brokers, and other financial institutions.

DIVIDENDS

In January 2019, our Board of Directors declared a quarterly cash dividend of \$0.34 per share of Common Stock, which was paid on February 20, 2019 to stockholders of record as of January 30, 2019. While we expect to continue to pay a regular quarterly dividend of \$0.34 per share in 2019, the timing, declaration, amount and payment of any future cash dividends are at the discretion of the Board of Directors and will depend on our available cash, working capital, financial condition, results of operations, capital requirements, covenants in our credit facility, applicable law and other factors that our Board of Directors considers relevant.

RECENT SALES OF UNREGISTERED SECURITIES

Certain French employees are eligible to participate in the FCP Aptar Savings Plan (the "Plan"). An independent agent purchases shares of Common Stock available under the Plan for cash on the open market and we do not issue shares. We do not receive any proceeds from the purchase of Common Stock under the Plan. The agent under the Plan is Banque Nationale de Paris Paribas Fund Services. No underwriters are used under the Plan. All shares are sold in reliance upon the exemption from registration under the Securities Act of 1933 provided by Regulation S promulgated under that Act. During the quarter ended December 31, 2018, the Plan purchased 7,750 shares of our Common Stock on behalf of the participants at an average price of \$100.76 per share, for an aggregate amount of \$781 thousand, and sold 1,200 shares of our Common Stock on behalf of the participants at an average price of \$103.97 per share, for an aggregate amount of \$125 thousand. At December 31, 2018, the Plan owned 82,677 shares of our Common Stock.

ISSUER PURCHASES OF EQUITY SECURITIES

On October 20, 2016, we announced a share repurchase authorization of up to \$350 million of Common Stock. This authorization replaces previous authorizations and has no expiration date. We may repurchase shares through the open market, privately negotiated transactions or other programs, subject to market conditions.

We did not repurchase any shares during the fourth quarter of 2018 and have \$80.2 million of remaining authorization as of December 31, 2018.

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SHARE PERFORMANCE

The following graph shows a five year comparison of the cumulative total stockholder return on our Common Stock as compared to the cumulative total return of the Standard & Poor's 500 Composite Stock Price Index and to an index of peer group companies we selected. The companies included in the peer group are: A. Schulman, Inc., Bemis Company, Inc., Berry Global Group, Inc., Crown Holdings, Inc., Graphic Packaging Holding Company, Greif Inc., H.B. Fuller Company, International Flavors & Fragrances, Inc., KapStone Paper and Packaging Corporation, Owen's Illinois, Inc., Packaging Corporation of America, PH Glatfelter Company., Rayonier Inc., Sealed Air Corporation, Sensient Technologies Corporation, Silgan Holdings, Inc., Sonoco Products Company, Stepan Company, TriMas Corporation and West Pharmaceutical Services Inc.

Comparison of 5 Year Cumulative Stockholder Returns

The graph and other information furnished in the section titled "Share Performance" under this Part II, Item 5 of this Form 10 K shall not be deemed to be "soliciting" material or to be "filed" with the Securities and Exchange Commission or subject to Regulation 14A or 14C, or to the liabilities of Section 18 of the Securities Exchange Act of 1934, as amended.

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ITEM 6. SELECTED FINANCIAL DATA

FIVE YEAR SUMMARY OF SELECTED FINANCIAL DATA

Dollars in millions, except per share data

Years Ended December 31,	2018	2017	2016	2015	2014
Statement of Income Data:					
Net Sales	\$ 2,764.8	\$ 2,469.3	\$ 2,330.9	\$ 2,317.1	\$ 2,597.8
Cost of sales (exclusive of depreciation and amortization shown below) (1)	1,813.0	1,603.1	1,496.2	1,499.0	1,752.6
% of Net Sales	65.6 %	64.9 %	64.2 %	64.7 %	67.5 %
Selling, research & development and administrative	430.0	387.4	366.3	349.1	382.1
% of Net Sales	15.6 %	15.7 %	15.7 %	15.1 %	14.7 %
Depreciation and amortization	171.7	153.1	154.8	138.9	152.2
% of Net Sales	6.2 %	6.2 %	6.6 %	6.0 %	5.8 %
Restructuring initiatives	63.8	2.2	—	—	—
% of Net Sales	2.3 %	0.1 %	— %	— %	— %
Operating Income	286.3	323.5	313.7	330.2	310.9
% of Net Sales	10.3 %	13.1 %	13.5 %	14.2 %	12.0 %
Net Income	194.8	220.0	205.6	199.3	191.6
% of Net Sales	7.0 %	8.9 %	8.8 %	8.6 %	7.4 %
Net Income Attributable to AptarGroup, Inc.	194.7	220.0	205.6	199.3	191.7
% of Net Sales	7.0 %	8.9 %	8.8 %	8.6 %	7.4 %
Net Income Attributable to AptarGroup, Inc. per Common Share:					
Basic	3.12	3.52	3.27	3.19	2.95
Diluted	3.00	3.41	3.17	3.09	2.85
Balance Sheet and Other Data:					
Capital Expenditures	\$ 211.3	\$ 156.6	\$ 129.0	\$ 149.3	\$ 161.9
Total Assets	3,377.7	3,137.8	2,606.8	2,437.0	2,436.5
Long-Term Obligations	1,126.0	1,191.1	772.7	760.8	588.2
Net Debt (2)	1,028.1	544.7	480.3	298.1	440.4
Total Stockholders' Equity	1,422.9	1,312.0	1,174.2	1,149.7	1,103.9
Capital Expenditures % of Net Sales	7.6 %	6.3 %	5.5 %	6.4 %	6.2 %
Interest Bearing Debt to Total Capitalization (3)	47.6 %	48.9 %	44.6 %	41.6 %	43.2 %
Net Debt to Net Capitalization (4)	41.9 %	29.3 %	29.0 %	20.6 %	28.5 %
Cash Dividends Declared per Common Share	1.32	1.28	1.22	1.14	1.09

- (1) Cost of sales includes \$7.4 million reduction in expense for 2015 due to a change in accounting method relating to our inventory accounting methods.
- (2) Net Debt is interest bearing debt less cash and cash equivalents.
- (3) Total Capitalization is Total Stockholders' Equity plus Interest Bearing Debt.
- (4) Net Capitalization is Total Stockholders' Equity plus Net Debt.

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ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

(Dollars in thousands, except per share amounts or as otherwise indicated)

The objective of the following Management's Discussion and Analysis of Consolidated Results of Operations and Financial Condition ("MD&A") is to help the reader understand the financial performance of AptarGroup, Inc. MD&A is presented in eight sections: Overview, Results of Operations, Liquidity and Capital Resources, Off Balance Sheet Arrangements, Overview of Contractual Obligations, Recently Issued Accounting Pronouncements, Critical Accounting Estimates, Operations Outlook and Forward Looking Statements. MD&A should be read in conjunction with our Consolidated Financial Statements and accompanying Notes to Consolidated Financial Statements contained elsewhere in this Annual Report on Form 10 K.

In MD&A, "we," "our," "us," "AptarGroup," "AptarGroup, Inc.," "Aptar" and the "Company" refer to AptarGroup, Inc. and its consolidated subsidiaries.

OVERVIEW

GENERAL

Aptar is a leading global supplier of a broad range of innovative dispensing, sealing and active packaging solutions for the beauty, personal care, home care, prescription drug, consumer health care, injectables, food and beverage markets. We use insights, design, engineering and science to create innovative packaging technologies that build brand value for its customers, and, in turn, make a meaningful difference in the lives, looks, health and homes of people around the world.

In addition to the information presented herein that conforms to U.S. GAAP, we also present certain financial information that does not conform to U.S. GAAP, which are referred to as non-U.S. GAAP financial measures. Management may assess our financial results both on a U.S. GAAP basis and on a non-U.S. GAAP basis. We believe it is useful to present these non-U.S. GAAP financial measures because they allow for a better period over period comparison of operating results by removing the impact of items that, in management's view, do not reflect Aptar's core operating performance. These non-U.S. GAAP financial measures should not be considered in isolation or as a substitute for U.S. GAAP financial results, but should be read in conjunction with the audited consolidated statements of income and other information presented herein. Investors are cautioned against placing undue reliance on these non-U.S. GAAP measures. Further, investors are urged to review and consider carefully the adjustments made by management to the most directly comparable U.S. GAAP financial measure to arrive at these non-U.S. GAAP financial measures. See the reconciliation of non-U.S. GAAP measures starting on page 23.

For the year ended December 31, 2018, reported sales increased 12% to \$2.76 billion from \$2.47 billion a year ago. Core sales, excluding the positive impact from changes in currency exchange rates and acquisition effects, increased approximately 8%. A reconciliation of core sales growth to reported net sales growth, the most directly comparable U.S. GAAP measure, can be found on page 16. During 2018, we achieved strong top line growth across each segment, each geographic regional and in all end markets other than beverage, which was slightly down on lower custom tooling sales. We continued to benefit from our Commercial Excellence and Transformation initiatives, especially in our Beauty + Home segment. We also faced inflationary cost increases that had negative effects on our profitability and we are working diligently to increase prices to offset these headwinds.

2018 HIGHLIGHTS

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- Reported sales increased 12%. Core sales, excluding currency and acquisition effects, grew 8%.
- Reported net income decreased 11%. Adjusted EBITDA, excluding among other things restructuring expenses, acquisition costs and purchase accounting adjustments related to acquired inventory, increased 16% and adjusted EBITDA margin was 20% compared to 19% a year ago.
- Business transformation underway and we began to see the positive results on Beauty + Home segment's top line growth; margin improvements were offset by headwinds including the timing of raw material cost pass-throughs and isolated operational challenges.
- Acquired strategic technologies (CSP Technologies and Reboul).
- 2018 was our 25th consecutive year of paying an increased dividend.

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RESULTS OF OPERATIONS

The following table sets forth the consolidated statements of income and the related percentages of net sales for the periods indicated. Certain previously reported amounts have been reclassified to conform to the current period presentation:

Year Ended December 31,	2018		2017		2016	
	Amount in	% of	Amount in	% of	Amount in	% of
	\$ Thousands	Net Sales	\$ Thousands	Net Sales	\$ Thousands	Net Sales
Net sales	\$ 2,764,761	100.0 %	\$ 2,469,283	100.0 %	\$ 2,330,934	100.0 %
Cost of sales (exclusive of depreciation and amortization shown below)	1,812,961	65.6	1,603,070	64.9	1,496,174	64.2
Selling, research & development and administrative	429,955	15.6	387,424	15.7	366,269	15.7
Depreciation and amortization	171,747	6.2	153,094	6.2	154,802	6.6
Restructuring initiatives	63,829	2.3	2,208	0.1	—	—
Operating income	286,269	10.3	323,487	13.1	313,689	13.5
Other expense	(20,249)	(0.7)	(28,662)	(1.2)	(33,192)	(1.5)
Income before income taxes	266,020	9.6	294,825	11.9	280,497	12.0
Net Income	194,766	7.0	220,029	8.9	205,604	8.8
Effective tax rate	26.8	%	25.4	%	26.7	%
Adjusted EBITDA margin (1)	19.9	%	19.2	%	20.4	%

(1) Adjusted EBITDA margin is calculated as Adjusted EBITDA divided by Reported Net Sales. See the reconciliation of Non-U.S. GAAP measures starting on page 23.

NET SALES

For the year ended December 31, 2018, reported net sales increased 12% to \$2.76 billion from \$2.47 billion a year ago. Our most significant currency exposure is with the euro. During 2018, the average U.S. dollar exchange rate weakened compared to the euro, and this was the primary reason currency translation effects contributed 2% to our sales growth. Sales were also positively impacted 2% by the acquisitions of CSP Technologies and Rebol. Therefore, 2018 sales, excluding acquisitions and changes in foreign currency rates (“core sales”), increased 8% as all three segments reported growth over 2017.

Year Ended December 31, 2018 Net Sales Change versus Prior Year	Beauty + Home		Pharma		Food + Beverage		Total	
		%		%		%		%
Core Sales Growth	7	%	12	%	5	%	8	%
Acquisitions	1	%	4	%	4	%	2	%
Currency Effects (1)	1	%	2	%	1	%	2	%

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Total Reported Net Sales Growth 9 % 18 % 10 % 12 %

(1) Currency effects are calculated by translating last year's amounts at this year's foreign exchange rates.

In 2017, reported net sales increased 6% to \$2.47 billion from \$2.33 billion a year ago. The average U.S. dollar exchange rate weakened compared to the euro while the impact of the other major currencies related to our business was mixed. This resulted in a positive currency translation impact of 1%. The 2016 acquisition of Mega Airless positively impacted sales by 1%. Therefore, core sales increased 4% over the prior year.

Year Ended December 31, 2017 Net Sales Change versus Prior Year	Beauty + Home	Pharma	Food + Beverage	Total
Core Sales Growth	2 %	8 %	6 %	4 %
Acquisitions	1 %	— %	— %	1 %
Currency Effects (1)	1 %	1 %	— %	1 %
Total Reported Net Sales Growth	4 %	9 %	6 %	6 %

(1) Currency effects are calculated by translating last year's amounts at this year's foreign exchange rates.

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Foreign currency effects are approximations of the adjustment necessary to state the prior year net sales using current period exchange rates. For further discussion on net sales by reporting segment, please refer to the segment analysis of net sales and operating income on the following pages.

The following table sets forth, for the periods indicated, net sales by geographic location:

Years Ended December 31,	2018	% of Total	2017	% of Total	2016	% of Total
Domestic	\$ 726,336	26	\$ 642,164	26	\$ 619,814	27
Europe	1,627,478	59	1,426,173	58	1,329,398	57
Other Foreign	410,947	15	400,946	16	381,722	16

COST OF SALES (EXCLUSIVE OF DEPRECIATION AND AMORTIZATION SHOWN BELOW)

Our cost of sales (“COS”) as a percent of net sales increased to 65.6% in 2018 compared to 64.9% in 2017. During 2018, we reported a higher COS percentage mainly due to a \$14.2 million negative impact of purchase accounting adjustments related to our CSP Technologies and Reboul acquisitions. Our overall COS percentage was also negatively impacted approximately \$12.3 million related to the timing of passing through higher material costs. During 2018, we experienced increases in several raw materials, principally resin and metal. While the majority of our material cost increases can be passed along to our customers in our selling prices, we experience a lag in the timing of passing on these cost increases. During 2018, we had a further increase in our COS percentage due to a \$4.3 million increase in custom tooling sales. Typically, our tooling sales margins are lower than our product sales margins. Therefore, the increase in tooling sales during 2018 negatively impacted our COS percentage.

In 2017, our COS as a percent of net sales increased to 64.9% compared to 64.2% in 2016. Our COS percentage was negatively impacted by approximately \$6.1 million of higher material costs. The main driver was higher resin costs. We also experienced continued operational inefficiencies in our custom decorative packaging business in Europe. Tooling sales were also approximately \$10.1 million higher in 2017 compared to the prior year. As discussed above, sales of custom tooling typically generates lower margins than product sales, so higher tooling sales negatively impacts COS as a percentage of sales.

SELLING, RESEARCH & DEVELOPMENT AND ADMINISTRATIVE

Our Selling, Research & Development and Administrative expenses (“SG&A”) increased approximately 11% or \$42.6 million to \$430.0 million in 2018 compared to \$387.4 million in 2017. Excluding changes in foreign currency rates, SG&A increased by approximately \$34.7 million compared to the same period a year ago. The increase is mainly due to \$9.6 million of transaction costs and \$9.5 million of incremental operational costs related to our CSP Technologies and Reboul acquisitions during 2018. We also recognized increases in professional fees and higher personnel costs in accordance with our growth strategy. Although SG&A increased in amount, SG&A as a percentage of net sales in 2018 decreased to 15.6% compared to 15.7% in 2017 due to the strong increase in sales.

In 2017, our SG&A increased approximately 6% or \$21.1 million to \$387.4 million in 2017 compared to \$366.3 million in 2016. Excluding changes in foreign currency rates, SG&A increased by approximately \$17.3 million compared to 2016. The increase is mainly due to increases in professional fees and salary expenses related to specific

projects during the third and fourth quarters of 2017 along with other normal inflationary increases. During 2017, we also recognized \$1.3 million of professional fees related to our acquisition of a minority investment in Kali Care, Inc. and \$1.5 million of incremental operating costs related to the two additional months of Mega Airless activity. We also recognized \$2.5 million of additional long-term incentive compensation costs related to the performance of our common stock, \$1.5 million for the estimated costs to remediate environmental contamination found at our facility in Brazil and \$1.3 million of higher research & development costs due to lower research tax credits available in certain jurisdictions during 2017. These increases were partially offset by one-time transaction costs of \$5.6 million related to the Mega Airless acquisition in 2016, which did not repeat in 2017. SG&A as a percentage of net sales remained stable at 15.7% when comparing 2017 results to 2016.

DEPRECIATION AND AMORTIZATION

Reported depreciation and amortization expense increased approximately 12% or \$18.6 million to \$171.7 million in 2018 compared to \$153.1 million compared to the same period a year ago. Excluding changes in foreign currency rates, depreciation and amortization increased by approximately \$15.4 million compared to the same period a year ago. This increase is due to \$8.6 million of incremental operational costs related to our CSP Technologies and Rebolou acquisitions. We also realized increased capital spending during the past year to support the growth in our business. Depreciation and amortization as a percentage of net sales remained stable at 6.2% when comparing 2018 results to 2017.

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In 2017, depreciation and amortization expense decreased approximately 1% or \$1.7 million to \$153.1 million compared to \$154.8 million in 2016. Excluding changes in foreign currency rates, depreciation and amortization decreased by approximately \$4.0 million compared to 2016. The decrease is due to several large investments becoming fully depreciated during 2017 partially offset by incremental depreciation and amortization costs of \$2.6 million related to the two additional months of Mega Airless activity in 2017. As depreciation expenses decreased due to the lapsing of these large investments, depreciation and amortization as a percentage of net sales decreased to 6.2% compared to 6.6% in 2016.

RESTRUCTURING INITIATIVES

In late 2017, Aptar began a business transformation plan to drive profitable sales growth, increase operational excellence, enhance our approach to innovation and improve organizational effectiveness. The primary focus of the plan is the Beauty + Home segment; however, certain global general and administrative functions are also being addressed. During the 2018, we recognized approximately \$63.8 million of restructuring costs related to this plan with approximately \$52.2 million, \$3.6 million, \$4.2 million and \$3.8 million reported within the Beauty + Home segment, Pharma segment, Food + Beverage segment and Corporate & Other, respectively. During 2017, we reported restructuring costs of \$2.2 million with approximately \$0.5 million of these costs reported within the Beauty + Home segment and \$1.7 million reported within the Food + Beverage segment. Using current exchange rates, we estimate total implementation costs of approximately \$90 million over three years. We also anticipate making capital investments related to the transformation plan of approximately \$55 million, of which the majority will be in 2019. We expect this business transformation to yield annualized incremental EBITDA of approximately \$80 million by the end of 2020, compared with the 2017 levels, principally within the Beauty + Home segment.

OPERATING INCOME

Reported operating income decreased approximately \$37.2 million or 12% to \$286.3 million in 2018 compared to \$323.5 million in 2017. Excluding changes in currency rates, operating income decreased by approximately \$44.7 million in 2018 compared to 2017. Operating income as a percentage of net sales decreased to 10.3% in 2018 compared to 13.1% for the prior year. These decreases are due to \$61.6 million of incremental restructuring costs along with \$14.2 million and \$9.6 million of purchase accounting adjustments and transaction costs related to our CSP Technologies and Rebolu acquisitions. Without these costs, operating profitability improved approximately \$40.7 million due to the higher sales reported during 2018.

In 2017, operating income increased approximately \$9.8 million or 3% to \$323.5 million compared to \$313.7 million in 2016. Excluding changes in currency rates, operating income increased by approximately \$6.4 million in 2017 compared to 2016. Higher sales along with lower depreciation and amortization expenses more than offset higher SG&A and restructuring costs. However, reported operating income as a percentage of net sales decreased to 13.1% in 2017 compared to 13.5% for 2016 as incremental sales volumes were not at the same gross margin percentage mainly due to higher cost of sales as discussed above.

NET OTHER EXPENSES

Net other expenses in 2018 decreased to \$20.2 million compared to \$28.7 million in 2017. This decrease is primarily due to \$8.0 million of lower interest expense and a \$1.6 million increase in interest income. The decrease in interest expense is mainly due to the prepayment of two of our higher interest private placement facilities with cash available from our repatriation of foreign earnings to the U.S. during 2017. In 2017, we incurred \$4.7 million of incremental interest expense to prepay these two facilities. Included in 2018 miscellaneous income is a gain of approximately \$6.5 million on our investment in Reciprocal Labs, doing business as Propeller Health, due to observable price changes, while in 2017 we realized a \$10.6 million gain on insurance recovery related to a fire in our Anney, France facility.

In 2017, net other expenses decreased to \$28.7 million compared to \$33.2 million in 2016. This decrease is mainly driven by a \$10.6 million gain on insurance recovery related to a fire in our Annecy, France facility and an additional \$2.8 million of interest income on U.S. cash balances. These decreases in net other expenses were offset by \$4.7 million of incremental interest expense incurred to prepay two of our private placement facilities during the fourth quarter of 2017. Prior year results also included a \$2.0 million gain on the sale of our minority interest in an injectable drug delivery device company in 2016.

EFFECTIVE TAX RATE

The reported effective tax rate on net income for 2018 and 2017 was 26.8% and 25.4%, respectively. The higher tax rate for 2018 reflects the impact in the U.S. of new tax provisions, most notably the global intangible low-taxed income (“GILTI”) and base erosion anti-abuse tax (“BEAT”) (+2.5%) and the impact of loss operations not tax effected (+1.6%). The comparable prior year reflects one-time costs associated with the U.S. tax reform transition tax on certain unremitted earnings, which offset the unfavorable items above.

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On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (the “TCJA”). The TCJA made broad and complex changes to the U.S. tax code that impacted 2017 and 2018 results including, but not limited to:

- (1) reducing the U.S. federal corporate tax rate from 35% to 21%, effective January 1, 2018, which required us to remeasure our deferred tax accounts, and
- (2) requiring a one-time transition tax on certain unremitted foreign earnings.

Shortly after the TCJA was enacted, the SEC staff issued Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act (“SAB 118”), which provides guidance on accounting for the TCJA’s impact. SAB 118 provides a measurement period, which in no case should extend beyond one year from the TCJA enactment date, during which a company acting in good faith may complete the accounting for the impacts of the TCJA under ASC Topic 740. In accordance with SAB 118, we have reflected the income tax effects of the TCJA in the reporting period in which the accounting under ASC Topic 740 is complete.

We were able to make a reasonable estimate of the transition tax and recorded a provisional transition tax obligation of \$31.6 million in 2017. As a result of additional guidance relating to the calculation of the transition tax that was promulgated during 2018, we recorded a \$2.6 million benefit in 2018. To reflect the reduction of the U.S. corporate tax rate, we recorded a provisional adjustment to our net deferred tax balances, with a corresponding discrete net tax provisional benefit of \$6.8 million in 2017. We reflected a \$2.8 million benefit during 2018 related to the change in U.S. tax rate. We have elected to account for the tax on GILTI as a period cost and not as a measure of deferred taxes in the current period.

At December 31, 2018, as a result of the GILTI tax provisions and the transition tax noted above, which subjected all of the previously untaxed foreign earnings as of December 31, 2017 to U.S. taxation, we do not have a balance of foreign earnings that will be subject to U.S. taxation. We continually analyze our global working capital requirements and the potential tax liabilities that would be incurred if the non-U.S. subsidiaries made a distribution of their cash or distributable reserves. These liabilities would include local country withholding and income tax and potential U.S. state taxation. We have recorded a \$2.2 million liability for distributions expected to be made to Europe early in 2019. As of December 31, 2018, all other cash or distributable reserve amounts will continue to be reinvested indefinitely and would become subject to these additional taxes if they were remitted as dividends. We estimate the additional tax that would be payable on these earnings to be in the range of \$20 million to \$30 million.

The reported effective tax rate on net income for 2017 and 2016 was 25.4% and 26.7%, respectively. The lower tax rate for 2017 reflects a benefit from the new accounting standard for employee share-based payments, which we adopted in 2017 (-3.5%). The 2017 rate also includes items attributable to the U.S. tax legislation as described above. The tax rate impact from the legislation includes a provisional tax charge related to the tax on unremitted earnings (+10.7%) which is partially offset by a provisional deferred tax benefit related to the enacted lower U.S. corporate tax rate (-2.3%). The 2017 tax rate also includes a benefit from the resolution of a forward contract transaction (-8.1%). The comparable prior year reflects higher tax benefits from European investment incentives (+1.4%).

NET INCOME ATTRIBUTABLE TO APTARGROUP, INC.

We reported net income of \$194.7 million compared to \$220.0 million reported in 2017 and \$205.6 million reported in 2016.

BEAUTY + HOME SEGMENT

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Years Ended December 31,	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Net Sales	\$ 1,426,382	\$ 1,313,786	\$ 1,261,086	8.6	% 4.2 %
Adjusted EBITDA (1)	185,926	173,227	186,993	7.3	(7.4)
Adjusted EBITDA margin (1)	13.0 %	13.2 %	14.8 %		

(1) Adjusted EBITDA is calculated as earnings before net interest, taxes, depreciation, amortization, unallocated corporate expenses, restructuring, acquisition-related costs, and other special items. Adjusted EBITDA margins are calculated as Adjusted EBITDA divided by Reported Net Sales. See the reconciliation of non-U.S. GAAP measures starting on page 23.

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Reported net sales increased approximately 9% in 2018 to \$1.43 billion compared to \$1.31 billion in 2017. Our Rebolu acquisition positively impacted net sales by 1% while changes in currency rates positively impacted net sales by 1%. Therefore, core sales increased 7% in 2018 compared to the prior year. While the majority of this increase was due to higher products sales, we also benefitted from \$9.9 million of additional revenue due to resin pass-throughs to our customers and \$9.4 million of incremental tooling sales, especially within our personal care market. Core sales were higher across all three markets as personal care, beauty and home care increased by 8%, 7% and 3%, respectively. Strong sales of our products used on baby care and body care applications along with higher tooling sales were responsible for the increase in personal care sales during 2018 compared to 2017. Beauty sales benefitted from increased sales of our products used on color cosmetic and facial skin care applications while home care realized an increase in sales of our products used on household cleaner and automotive applications during 2018.

Year Ended December 31, 2018 Net Sales Change over Prior Year	Personal Care	Beauty	Home Care	Total
Core Sales Growth	8	% 7	% 3	% 7
Acquisitions	—	% 1	% —	% 1
Currency Effects (1)	—	% 2	% 1	% 1
Total Reported Net Sales Growth	8	% 10	% 4	% 9

(1) Currency effects are calculated by translating last year's amounts at this year's foreign exchange rates. In 2017, reported net sales increased approximately 4% to \$1.31 billion compared to \$1.26 billion in 2016. The Mega Airless acquisition positively impacted net sales by 1% in 2017 while changes in currency rates positively impacted net sales by 1%. Therefore, core sales increased 2% in 2017 compared to 2016. The majority of this increase is due to higher product sales. Tooling sales and the pass-through of higher resin prices to our customers also positively impacted sales by \$4.0 million and \$0.6 million, respectively. Core sales to the personal care and beauty markets each increased 2% while core sales to the home care market declined slightly during 2017 compared to 2016. The beauty market increased as strong sales of our products used on facial skin care applications and higher sampling and promotion sales more than offset lower sales of our products sold to our prestige fragrance market. The personal care markets also showed improvement over the prior year due to strong sales of our products used on body care and hair care applications. Sales of our products to the home care market decreased 1% as new product sales used on automotive applications were not able to completely offset lower sales of our products used on insecticide applications, predominately in North America and Latin America related to the unusually high demand for these products in 2016.

Year Ended December 31, 2017 Net Sales Change over Prior Year	Personal Care	Beauty	Home Care	Total
Core Sales Growth	2	% 2	% (1)	% 2
Acquisitions	1	% 1	% —	% 1
Currency Effects (1)	1	% 2	% 2	% 1
Total Reported Net Sales Growth	4	% 5	% 1	% 4

(1) Currency effects are calculated by translating last year's amounts at this year's foreign exchange rates. Adjusted EBITDA for 2018 increased to \$185.9 million from \$173.2 million reported in 2017. Our increase in sales along with operational improvements more than compensated for the increased resin and metal costs of approximately \$10.4 million.

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For 2017, Adjusted EBITDA decreased to \$173.2 million from \$187.0 million reported in 2016. Gains on sales volume increases were offset by higher material costs and operational inefficiencies, mainly in our custom decorative packaging business in Europe. As discussed above, we have initiated a business transformation plan to address these challenges. During 2017, we also recognized a charge of \$1.5 million for the estimated costs to remediate environmental contamination at our anodizing facility in Brazil.

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PHARMA SEGMENT

Years Ended December 31,	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016	
Net Sales	\$ 954,652	\$ 805,880	\$ 741,473	18.5	% 8.7	%
Adjusted EBITDA (1)	343,706	275,933	259,241	24.6	6.4	
Adjusted EBITDA margin (1)	36.0 %	34.2 %	35.0 %			

(1) Adjusted EBITDA is calculated as earnings before net interest, taxes, depreciation, amortization, unallocated corporate expenses, restructuring, acquisition-related costs and other special items. Adjusted EBITDA margins are calculated as Adjusted EBITDA divided by Reported Net Sales. See the reconciliation of non-U.S. GAAP measures starting on page 23.

Reported net sales increased approximately 18% in 2018 to \$954.7 million compared to \$805.9 million in 2017. Changes in currency positively affected net sales by 2% while the acquisition of CSP Technologies positively impacted sales by 4% in 2018. Therefore, core sales increased 12% in 2018 compared to the prior year. Sales increased in all three of our pre-existing markets during 2018. The prescription drug market reported a core sales increase of 11% on strong sales of our products sold for central nervous system and allergic rhinitis treatments. Core sales to the consumer health care market increased 16% as strong demand for our products used on eye care, nasal decongestant and nasal saline applications offset \$5.1 million of lower tooling sales. Core sales of our products to the injectables markets increased 6% due to strong sales of our injectable components used on vaccine products. In total, price increases of \$7.4 million offset \$5.4 million of lower tooling sales for 2018 compared to 2017.

Year Ended December 31, 2018 Net Sales Change over Prior Year	Prescription Drug	Consumer Health Care	Injectables	Active Packaging	Total
Core Sales Growth	11 %	16 %	6 %	— %	12 %
Acquisitions	—	— %	— %	100 %	4 %
Currency Effects (1)	3 %	1 %	4 %	— %	2 %
Total Reported Net Sales Growth	14 %	17 %	10 %	100 %	18 %

(1) Currency effects are calculated by translating last year's amounts at this year's foreign exchange rates. In 2017, reported net sales increased approximately 9% to \$805.9 million compared to \$741.5 million in 2016. Changes in currency rates positively impacted net sales by 1%. Therefore, core sales increased 8% in 2017 compared to the prior year. All three markets reported increases during 2017 with core sales to the prescription drug, consumer health care and injectables markets increasing 7%, 7% and 9%, respectively. Consumer health care realized strong demand for our products used on nasal decongestants and nasal salines. The prescription drug market reported core sales increases across all applications with strong sales of our devices used on asthma, COPD and allergic rhinitis products driving the growth in 2017. Core sales of our products to the injectables markets increased due to improved sales of our components used on antithrombotic and small molecule products. For the segment, customer tooling sales, excluding foreign currency changes, decreased \$3.2 million in 2017 to \$30.1 million compared to \$33.3 million in the prior year.

Year Ended December 31, 2017 Net Sales Change over Prior Year	Prescription Drug	Consumer Health Care	Injectables	Active Packaging	Total
Core Sales Growth	7	% 7	% 9	% —	% 8 %
Currency Effects (1)	1	% 1	% 2	% —	% 1 %
Total Reported Net Sales Growth	8	% 8	% 11	% —	% 9 %

(1) Currency effects are calculated by translating last year's amounts at this year's foreign exchange rates. Adjusted EBITDA for 2018 increased to \$343.7 million compared to \$275.9 million in 2017. The increase sales discussed above along with improved operational efficiencies lead to the increase in profitability. We also recognized a gain of approximately \$6.5 million on our investment in Propeller Health.

In 2017, adjusted EBITDA increased to \$275.9 million compared to \$259.2 million in 2016. Strong sales volumes across all three markets were able to offset unfavorable manufacturing variances, \$1.3 million of professional fees related to our acquisition of a minority investment in Kali Care, Inc. and start-up costs related to our new injectable capacity in North America.

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FOOD + BEVERAGE SEGMENT

Years Ended December 31,	2018	2017	2016	% Change		% Change	
				2018 vs. 2017		2017 vs. 2016	
Net Sales	\$ 383,727	\$ 349,617	\$ 328,375	9.8	%	6.5	%
Adjusted EBITDA (1)	57,589	62,903	61,588	(8.4)		2.1	
Adjusted EBITDA margin (1)	15.0	%	18.0	%		18.8	%

(1) Adjusted EBITDA is calculated as earnings before net interest, taxes, depreciation, amortization, unallocated corporate expenses, restructuring, acquisition-related costs and other special items. Adjusted EBITDA margins are calculated as Adjusted EBITDA divided by Reported Net Sales. See the reconciliation of non-U.S. GAAP measures starting on page 23.

Reported net sales increased by approximately 10% in 2018 to \$383.7 million compared to \$349.6 million in 2017. The CSP Technologies acquisition positively impacted net sales by 4% while changes in currency rates positively impacted net sales by 1%. Therefore, core sales increased 5% in 2018 compared to the prior year. Core sales to the food market increased 9% while core sales to the beverage market decreased 1% compared 2017. Sales to the food market increased due to strong sales of our products used on infant nutrition and sauces/condiments applications complemented by strong increases in tooling sales. For the beverage market, strong sales of our products to our bottled water and juice customers were offset by a decrease in tooling sales and a decline in beverage closure volumes related to a customer in China. For the segment, 2018 sales were favorably impacted by a \$9.0 million increase on the pass-through of resin price changes while tooling sales were relatively flat.

Year Ended December 31, 2018	Net Sales Change over Prior Year			Food Beverage Total		
Core Sales Growth	9	%	(1)	%	5	%
Acquisitions	6	%	1	%	4	%
Currency Effects (1)	—	%	2	%	1	%
Total Reported Net Sales Growth	15	%	2	%	10	%

(1) Currency effects are calculated by translating last year's amounts at this year's foreign exchange rates. In 2017, reported net sales increased by approximately 6% to \$349.6 million compared to \$328.4 million in 2016. Changes in foreign currency rates had no impact on 2017 results. Therefore, core sales increased 6% in 2017 compared to the prior year. Core sales to the food and beverage markets increased 6% and 7%, respectively in 2017 compared to 2016. Sales to the food market increased due to strong sales of our products used on sauces and condiments. We also realized increases in sales of our products used on spreads, jelly and honey, non-beverage dairy and infant nutrition products. For the beverage market, strong sales to our bottled water customers offset a decrease in beverage closure sales related to a customer in China. Sales for 2017 were also favorably impacted by higher tooling sales of \$7.0 million.

Year Ended December 31, 2017						
Net Sales Change over Prior Year	Food		Beverage		Total	
Core Sales Growth	6	%	7	%	6	%
Currency Effects (1)	—	%	—	%	—	%
Total Reported Net Sales Growth	6	%	7	%	6	%

(1) Currency effects are calculated by translating last year's amounts at this year's foreign exchange rates. Adjusted EBITDA decreased approximately 8% to \$57.6 million in 2018 compared to \$62.9 million in 2017. This decrease is mainly due to significant material cost increases along with lower profit on our tooling projects and some price concessions to secure long-term supply contracts. While the majority of our material cost increases can be passed along to our customers in our selling prices, we experience a lag in the timing of passing on these cost increases. During 2018, we also recognized an impairment of \$1.6 million related to prepaid royalties as a result of lower than expected sales during the contractual period. This impairment does not impact our current product portfolio or future project pipeline related to the underlying technology.

In 2017, Adjusted EBITDA increased approximately 2% to \$62.9 million compared to \$61.6 million in 2017. Increased product and tooling sales more than offset price concessions to customers to secure long-term agreements. Improvements in productivity were able to offset increased legal fees to defend our intellectual property.

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CORPORATE & OTHER

In addition to our three reporting segments, Aptar assigns certain costs to “Corporate & Other,” which is presented separately in Note 18 of the Notes to the Consolidated Financial Statements. For Corporate & Other, Adjusted EBITDA (which excludes net interest, taxes, depreciation, amortization, restructuring, transaction costs and other special items) primarily includes certain professional fees, compensation and information system costs which are not allocated directly to our reporting segments.

Corporate & Other expense in 2018 decreased to \$36.3 million compared to \$37.5 million in 2017. This decrease is mainly due to lower professional fees and salary expenses and the impact of specific internal projects during 2017 that did not recur in 2018.

In 2017, Corporate & Other expense increased to \$37.5 million compared to \$31.7 million in 2016. This increase is mainly due to increases in professional fees and salary expenses related to specific internal projects. We also recognized \$1.7 million of additional long-term incentive compensation costs related to the performance of our common stock.

NON-U.S. GAAP MEASURES

In addition to the information presented herein that conforms to U.S. GAAP, we also present financial information that does not conform to U.S. GAAP, which are referred to as non-U.S. GAAP financial measures. Management may assess our financial results both on a U.S. GAAP basis and on a non-U.S. GAAP basis. We believe it is useful to present these non-U.S. GAAP financial measures because they allow for a better period-over-period comparison of operating results by removing the impact of items that, in management’s view, do not reflect Aptar’s core operating performance. These non-U.S. GAAP financial measures should not be considered in isolation or as a substitute for U.S. GAAP financial results, but should be read in conjunction with the audited consolidated statements of income and other information presented herein. Investors are cautioned against placing undue reliance on these non-U.S. GAAP measures. Further, investors are urged to review and consider carefully the adjustments made by management to the most directly comparable U.S. GAAP financial measure to arrive at these non-U.S. GAAP financial measures.

In our Management’s Discussion and Analysis, we exclude the impact of foreign currency translation when presenting net sales information, which we define as “constant currency.” Changes in net sales excluding the impact of foreign currency translation is a non-U.S. GAAP financial measure. As a worldwide business, it is important that we take into account the effects of foreign currency translation when we view our results and plan our strategies. Consequently, when our management looks at our financial results to measure the core performance of our business, we exclude the impact of foreign currency translation by translating our prior period results at current period foreign currency exchange rates. As a result, our management believes that these presentations are useful internally and may be useful to investors. We also exclude the impact of material acquisitions when comparing results to prior periods. Changes in operating results excluding the impact of acquisitions are non-U.S. GAAP financial measures. We believe it is important to exclude the impact of acquisitions on period over period results in order to evaluate performance on a more comparable basis.

We present earnings before net interest and taxes (“EBIT”) and earnings before net interest, taxes, depreciation and amortization (“EBITDA”). We also present our adjusted earnings before net interest and taxes (“Adjusted EBIT”) and adjusted earnings before net interest, taxes, depreciation and amortization (“Adjusted EBITDA”), both of which exclude, among other special items, the business transformation charges and acquisition-related costs. Our Outlook is also provided on a non-U.S. GAAP basis because certain reconciling items are dependent on future events that either cannot be controlled, such as tax and exchange rates, or reliably predicted because they are not part of our routine activities, such as restructuring and acquisition-related costs.

Finally, we provide a reconciliation of Net Debt to Net Capital as a non-U.S. GAAP measure. Net Debt is calculated as interest bearing debt less cash, cash equivalents and short-term investments while Net Capital is calculated as stockholder's equity plus Net Debt. Net Debt to Net Capital measures a company's financial leverage, which gives users an idea of a company's financial structure, or how it is financing its operations, along with insight into its financial strength. We believe that it is meaningful to take into consideration the balance of our cash, cash equivalents and short-term investments when evaluating our leverage. If needed, such assets could be used to reduce our gross debt position.

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	Year Ended December 31, 2018					
	Consolidated	Beauty + Home	Pharma	Food + Beverage	Corporate & Other	Net Interest
Net Sales	\$ 2,764,761	\$ 1,426,382	\$ 954,652	\$ 383,727	\$ -	\$ -
Reported net income	\$ 194,766					
Reported income taxes	71,254					
Reported income before income taxes	266,020	49,443	276,550	23,956	(58,359)	(25,570)
Adjustments:						
Restructuring initiatives	63,829	52,244	3,589	4,185	3,811	
Transaction costs related to acquisitions	9,598	574			9,024	
Purchase accounting adjustments related to acquired companies' inventory	14,172	119	12,072	1,981		
Adjusted earnings before income taxes	353,619	102,380	292,211	30,122	(45,524)	(25,570)
Interest expense	32,626					32,626
Interest income	(7,056)					(7,056)
Adjusted earnings before net interest and taxes (Adjusted EBIT)	379,189	102,380	292,211	30,122	(45,524)	-
Depreciation and amortization	171,747	83,546	51,495	27,467	9,239	-
Adjusted earnings before net interest, taxes, depreciation and amortization (Adjusted EBITDA)	\$ 550,936	\$ 185,926	\$ 343,706	\$ 57,589	\$ (36,285)	\$ -
Adjusted EBITDA margins (Adjusted EBITDA / Reported Net Sales)	19.9%	13.0%	36.0%	15.0%		

	Year Ended December 31, 2017					
	Consolidated	Beauty + Home	Pharma	Food + Beverage	Corporate & Other	Net Interest
Net Sales	\$ 2,469,283	\$ 1,313,786	\$ 805,880	\$ 349,617	\$ -	\$ -
Reported net income	\$ 220,029					
Reported income taxes	74,796					
	294,825	93,276	234,790	36,504	(34,618)	(35,127)

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Reported income before income taxes						
Adjustments:						
Restructuring initiatives	2,208	529		1,679		
Gain on insurance recovery	(10,648)				(10,648)	
Adjusted earnings before income taxes	286,385	93,805	234,790	38,183	(45,266)	(35,127)
Interest expense	40,597					40,597
Interest income	(5,470)					(5,470)
Adjusted earnings before net interest and taxes (Adjusted EBIT)	321,512	93,805	234,790	38,183	(45,266)	-
Depreciation and amortization	153,094	79,422	41,143	24,720	7,809	-
Adjusted earnings before net interest, taxes, depreciation and amortization (Adjusted EBITDA)	\$ 474,606	\$ 173,227	\$ 275,933	\$ 62,903	\$ (37,457)	\$ -
Adjusted EBITDA margins (Adjusted EBITDA / Reported Net Sales)	19.2%	13.2%	34.2%	18.0%		

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Net Debt to Net Capital Reconciliation	December 31, 2018	December 31, 2017
Notes payable, including revolving credit facilities	\$ 101,293	\$ 4,336
Current maturities of long-term obligations, net of unamortized debt issuance costs	62,678	61,833
Long-Term Obligations, net of unamortized debt issuance costs	1,125,993	1,191,146
Total Debt	1,289,964	1,257,315
Less:		
Cash and equivalents	261,823	712,640
Net Debt	\$ 1,028,141	\$ 544,675
Total Stockholders' Equity	\$ 1,422,871	\$ 1,312,048
Net Debt	1,028,141	544,675
Net Capital	\$ 2,451,012	\$ 1,856,723
Net Debt to Net Capital	41.9%	29.3%

LIQUIDITY AND CAPITAL RESOURCES

We believe we are in a strong financial position and have the financial resources to meet our business requirements in the foreseeable future. We have historically used cash flow from operations, our revolving credit facilities, stock option exercises and debt, as needed, as our primary sources of liquidity. Our primary uses of liquidity are to invest in equipment and facilities that are necessary to support our growth and to make acquisitions that will contribute to the achievement of our strategic objectives. Other uses of liquidity include repurchasing shares of our common stock and paying dividends to stockholders. In the event that customer demand would decrease significantly for a prolonged period of time and negatively impact cash flow from operations, we would have the ability to restrict and significantly reduce capital expenditure levels, as well as evaluate our acquisition strategy and dividend and share repurchase programs. A prolonged and significant reduction in capital expenditure levels could increase future repairs and maintenance costs as well as have a negative impact on operating margins if we were unable to invest in new innovative products.

During 2017, we voluntarily repatriated approximately \$1.0 billion from Europe to the U.S. This was achieved through a combination of surplus available cash and raising debt at our UK subsidiary in Europe. This gave us full financial flexibility to utilize the repatriated cash to meet our U.S. funding needs and for strategic business investments, including the recent acquisition of CSP Technologies. Adding euro-denominated debt better aligns our capital structure with our euro earnings base, and we were able to take advantage of historically low euro debt interest rates.

Cash and equivalents decreased to \$261.8 million at December 31, 2018 from \$712.6 million at December 31, 2017 primarily due to the acquisition of CSP Technologies. Total short and long-term interest bearing debt of \$1.3 billion at December 31, 2018 was at the same level as December 31, 2017. Due to the decrease in cash to fund our CSP Technologies acquisition, the ratio of our Net Debt (interest bearing debt less cash and cash equivalents) to Net Capital (stockholders' equity plus Net Debt) increased to 41.9% at December 31, 2018 compared to 29.3% at December 31, 2017. See the reconciliation of non-U.S. GAAP measures starting on page 23.

In 2018, our operations provided approximately \$313.6 million in cash flow compared to \$324.7 million in 2017 and \$325.3 million in 2016. Cash flow from operations was primarily derived from earnings before depreciation and amortization. The slight decrease in 2018 cash flow from operations compared to 2017 is primarily attributable to a decrease in net income due to restructuring charges along with higher working capital balances. Comparing 2017 to 2016, the decrease was primarily attributable to an additional \$30 million contribution to our domestic pension plan over the amount contributed in 2016.

We used \$735.5 million in cash for investing activities during 2018 compared to \$224.8 million during 2017 and \$300.5 million during 2016. The higher cash utilization in 2018 compared to 2017 is mainly due to acquisitions and higher capital investments. Approximately \$553.5 million of our cash (exclusive of \$24.1 million of cash acquired) was utilized to fund our acquisition of CSP Technologies during 2018. \$5.0 million was held at year end in restricted cash pending the finalization of a working capital adjustment. The \$5 million cash amount was released from restriction in January 2019 after the finalization of the working capital adjustment, resulting in a refund of \$1.0 million. We also invested \$10.0 million in preferred stock of Reciprocal Labs Corporation, doing business as Propeller Health, which is accounted for at cost, and acquired Reboul, a French manufacturer specializing in stamping, decorating and assembling metal and plastic packaging for the cosmetics and luxury markets, for an initial purchase price of approximately \$3.6 million (exclusive of \$112 thousand of cash acquired). Our investment in capital projects increased \$54.6 million during 2018 compared to 2017 to support the growth of our business. Comparing 2017 to 2016, we spent \$203.0 million less on acquisitions. However, in 2017 we did use \$66.2 million to settle a derivative as part of our repatriation project discussed below and increased our investment in capital projects by \$27.6 million compared to 2016.

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Financing activities utilized \$14.9 million in cash during 2018, compared to net cash provided by financing activities of \$114.8 million during 2017 and cash utilized of \$29.7 million in 2016. In 2018, we received net proceeds from our short term credit facility and stock option exercises of \$81.1 million and \$88.2 million, respectively. We used cash on hand to repay \$72.3 million of long-term debt, pay \$82.3 million of dividends and repurchase \$61.7 million of common stock. During 2017, we borrowed approximately \$800 million in Europe (see details below) and used the proceeds along with cash on hand to repatriate \$1.0 billion from Europe to the U.S. These funds were used to repay \$160 million outstanding on the U.S. revolving credit facility, repurchase \$161.5 million of common stock and prepay \$159 million of private placement debt. For 2016, proceeds from short term borrowings were used to partially finance the acquisition of Mega Airless and to repurchase and retire common stock.

In July 2017, we replaced our \$300 million revolving credit facility with a new 5-year multi-currency revolving credit facility with two tranches, providing for unsecured financing of up to \$300 million that is available in the U.S. and up to €150 million that is available to our wholly owned UK subsidiary. Each borrowing under the credit facility will bear interest at rates based on LIBOR, prime rates or other similar rates, in each case plus an applicable margin. A facility fee on the total amount of the facility is also payable quarterly, regardless of usage. The applicable margins for borrowings under the credit facility and the facility fee percentage may change from time to time depending on changes in Aptar's consolidated leverage ratio. We utilized €69 million of the UK subsidiary credit facility at December 31, 2018. We had no outstanding balance at December 31, 2017. During 2018, we incurred approximately \$1.5 million in interest and fees related to these credit facilities, while we incurred approximately \$1.5 million and \$2.0 million in interest and fees during 2017 and 2016, respectively.

Our revolving credit facility and certain long-term obligations require us to satisfy certain financial and other covenants including:

	Requirement	Level at December 31, 2018
Consolidated Leverage Ratio (1)	Maximum of 3.50 to 1.00	2.09 to 1.00
Consolidated Interest Coverage Ratio (1)	Minimum of 3.00 to 1.00	14.57 to 1.00

(1) Definitions of ratios are included as part of the revolving credit facility agreement.

Based upon the above consolidated leverage ratio covenant, we would have the ability to borrow approximately an additional \$711 million before the 3.50 to 1.00 ratio requirement would be exceeded.

Our foreign operations have historically met cash requirements with the use of internally generated cash or uncommitted short-term borrowings. We also have committed financing arrangements in both the U.S. and the UK as detailed above. We manage our global cash requirements considering (i) available funds among the many subsidiaries through which we conduct business, (ii) the geographic location of our liquidity needs, and (iii) the cost to access international cash balances.

During the third quarter of 2017, we entered into the borrowing arrangements summarized below through our wholly owned UK subsidiary to better balance our capital structure.

Debt Type	Amount	Term/Maturity	Interest Rate
			2.56% USD floating swapped to 1.36% EUR
Bank term loan	\$ 280,000	5 year amortizing/July 2022	fixed
Bank revolver	€ 150,000	5 year/July 2022	1.30% floating
Private placement	€ 100,000	6 year/July 2023	0.98% fixed
Private placement	€ 200,000	7 year/July 2024	1.17% fixed

Aptar also entered into a EUR/USD floating-to-fixed cross currency swap in July 2017 to mitigate the currency risk of U.S. dollar debt on a euro functional currency entity and to also mitigate the risk of variability in interest rates on the \$280 million bank term loan. We expect our future European cash flows will be sufficient to service this debt.

OFF BALANCE SHEET ARRANGEMENTS

We lease certain warehouse, plant and office facilities as well as certain equipment under noncancelable operating leases expiring at various dates through the year 2027. Most of the operating leases contain renewal options and certain equipment leases include options to purchase during or at the end of the lease term. Other than operating lease obligations, we do not have any off balance sheet arrangements. See the following section “Overview of Contractual Obligations” for future payments relating to operating leases.

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OVERVIEW OF CONTRACTUAL OBLIGATIONS

Below is a table of our outstanding contractual obligations and future payments as of December 31, 2018:

Payment Due by Period	Total	2019	2020-2021	2022-2023	2024 and After
Long-term debt (1)	\$ 1,183,136	\$ 61,350	\$ 119,161	\$ 372,957	\$ 629,668
Capital lease obligations (1)	8,353	1,327	2,372	1,430	3,224
Operating leases	109,133	26,512	37,915	22,774	21,932
Notes payable (2)	101,293	101,293	—	—	—
Purchase obligations (3)	49,671	43,426	6,073	172	—
Interest obligations (4)	163,580	33,767	59,940	47,562	22,311
Total Contractual Obligations	\$ 1,615,166	\$ 267,675	\$ 225,461	\$ 444,895	\$ 677,135

- (1) The future payments listed above for long-term debt repayments and capital lease obligations reflect only principal payments.
- (2) Notes payable mainly includes foreign short-term borrowings. The future payments listed above assume that no additional amounts will be drawn under the credit facility.
- (3) Purchase obligations are agreements to purchase goods or services that are enforceable and legally binding on the Company that specify all significant terms, including: fixed or minimum quantities to be purchased; fixed, minimum, or variable price provisions; and the approximate timing of the transactions.
- (4) Approximately 18.8% of our total interest bearing long term debt has variable interest rates. Using our long term variable rate debt outstanding as of December 31, 2018 of approximately \$224.1 million at an average rate of approximately 3.97%, we included approximately \$7.9 million of variable interest rate obligations in 2018. No variable interest rate obligations were included in subsequent years.

We make contributions to our domestic pension plans but currently we are not required to make a minimum pension contribution to those plans. We also contribute to our foreign pension plans but amounts are expected to be discretionary in 2019 and future years. Therefore, amounts related to these plans are not included in the preceding table.

We do not record a current portion of the liability for uncertain tax positions. Aside from deferred income taxes, we have approximately \$85.4 million of other deferred long term liabilities on the balance sheet, which consist primarily of retirement plan obligations. We are not able to reasonably estimate the timing of the long term payments or the amount by which the liability will increase or decrease over time. Therefore, the long term portion of the liability is excluded from the preceding table.

RECENTLY ISSUED ACCOUNTING STANDARDS

We have reviewed the recently issued accounting standards updates to FASB's Accounting Standards Codification that have future effective dates. Standards which are effective for 2018 are discussed in Note 1 – Summary of Significant Accounting Policies of the Notes to Consolidated Financial Statements.

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In February 2016, the FASB issued ASU 2016-02 and subsequent amendments, which requires organizations to recognize leases on the balance sheet, and disclose key information about leasing arrangements. The new standard establishes a right-of-use (“ROU”) model that requires a lessee to recognize an ROU asset and lease liability on the balance sheet for all leases with a term longer than 12 months. Leases will be classified as finance or operating, with classification affecting the pattern and recognition of expense in the income statement. The new standard is effective for fiscal years and interim periods beginning after December 15, 2018, with early adoption permitted. We have adopted the new standard as of January 1, 2019. A modified retrospective transition approach is required, applying the new standard to all leases existing at the date of initial application. An entity may choose to use either (1) its effective date or (2) the beginning of the earliest comparative period presented in the financial statements as its date of initial application. If an entity chooses the second option, the transition requirements for existing leases also apply to leases entered into between the date of initial application and the effective date. The entity must also recast its comparative period financial statements and provide the disclosures required by the new standard for the comparative periods. We expect to adopt the new standard on January 1, 2019 and use the effective date (option 1) as our date of initial application. Consequently, financial information will not be updated and the disclosures required under the new standard will not be provided for dates and periods before January 1, 2019. The new standard provides a number of optional practical expedients in transition. We expect to elect the ‘package of practical expedients’, which permits us not to reassess under the new standard our prior conclusions about lease identification, lease classification and initial direct costs. The new standard also provides practical expedients for an entity’s ongoing accounting. We currently expect to elect the short-term lease recognition exemption for all leases that qualify. This means, for those leases that qualify, we will not recognize ROU assets or lease liabilities, and this includes not recognizing ROU assets or lease liabilities for existing short-term leases of those assets in transition. While we continue to assess all of the effects of adoption, we currently believe the most significant effects relate to the recognition of new ROU assets and lease liabilities on our balance sheet for our operating leases and the significant new disclosures about our leasing activities.

In June 2016, the FASB issued ASU 2016-13, which changes the accounting guidance for measurement of credit losses on financial instruments. The guidance replaces the incurred loss impairment methodology in current U.S. GAAP with a methodology that reflects expected credit losses and requires consideration of a broader range of reasonable and supportable information when recording credit loss estimates. The new standard is effective for fiscal years and interim periods beginning after December 15, 2019. We are currently evaluating the impact of adopting this guidance.

In January 2017, the FASB issued ASU 2017-04, which provides guidance to simplify how an entity is required to test goodwill for impairment by eliminating Step 2 from the goodwill impairment test. As a result, impairment charges will be required for the amount by which a reporting unit’s carrying amount exceeds its fair value up to the amount of its allocated goodwill. The new standard is effective for the annual or any interim goodwill impairment tests in fiscal years beginning after December 15, 2019. We do not believe that this new guidance will have a material impact on our Consolidated Financial Statements.

In August 2018, the FASB issued ASU 2018-14, which amends disclosure requirements for defined benefit pension and other postretirement plans. The amendments in this update remove disclosures that no longer are considered cost beneficial, clarify the specific requirements of disclosures, and add disclosure requirements identified as relevant. The new standard is effective for fiscal years ending after December 15, 2020. As this update amends disclosure requirements, we do not expect any significant impact around adopting this guidance.

In August 2018, the FASB issued ASU 2018-15 to help entities evaluate the accounting for fees paid by a customer in a cloud computing arrangement (hosting arrangement) by providing guidance for determining when the arrangement includes a software license. The amendments in this update align the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use

software license). Accordingly, the amendments require an entity (customer) in a hosting arrangement that is a service contract to follow the guidance in Subtopic 350-40 to determine which implementation costs to capitalize as an asset related to the service contract and which costs to expense. The amendments also require the entity (customer) to expense the capitalized implementation costs of a hosting arrangement that is a service contract over the term of the hosting arrangement, which includes reasonably certain renewals. The new standard is effective for fiscal years beginning after December 15, 2019. We are currently evaluating the impact of adopting this guidance.

Other accounting standards that have been issued by the FASB or other standards setting bodies that do not require adoption until a future date are not expected to have a material impact on our consolidated financial statements upon adoption.

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CRITICAL ACCOUNTING ESTIMATES

The preparation of the financial statements requires us 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 continually evaluate our estimates, including those related to bad debts, inventories, intangible assets, income taxes, pensions and contingencies. We base our estimates on historical experience and on a variety of other assumptions believed to be reasonable in order to make judgments about the carrying values of assets and liabilities. Actual results may differ from these estimates under different assumptions or conditions. We believe the following critical accounting policies affect our more significant judgments and estimates used in preparation of our Consolidated Financial Statements. Management has discussed the development and selection of these critical accounting estimates with the audit committee of our Board of Directors and the audit committee has reviewed our disclosure relating to it in this Management's Discussion and Analysis of Consolidated Results of Operations and Financial Condition.

IMPAIRMENT OF GOODWILL

In accordance with current accounting standards, goodwill has an indefinite life and is not amortized. We evaluate our goodwill for impairment at the reporting unit level on an annual basis, or whenever indicators of impairment exist. We have determined that our Beauty + Home and Food + Beverage business segments represent reporting units. Within the Pharma segment, the injectables and active packaging divisions qualify as separate reporting units for goodwill impairment testing apart from the remaining Pharma business. As of December 31, 2018, we have \$712.1 million of goodwill, which is allocated as follows:

Reporting Unit	Balance at December 31, 2018
Pharma	\$ 93,529
Injectables	100,872
Active Packaging	165,482
Beauty + Home	223,933
Food + Beverage	128,279
Total	\$ 712,095

We believe that the accounting estimates related to determining the fair value of our reporting units is a critical accounting estimate because: (1) it is highly susceptible to change from period to period because it requires management to make assumptions about the future cash flows for each reporting unit over several years, and (2) the impact that recognizing an impairment would have on the assets reported on our balance sheet as well as our results of operations could be material. Management's determination of the fair value of our reporting units, based on future cash flows for the reporting units, requires significant judgment and the use of estimates and assumptions related to projected revenue growth rates, projected EBITDA margins, capital expenditures, working capital levels, the terminal growth factor, as well as the discount rate. Actual cash flows in the future may differ significantly from those forecasted today. The estimates and assumptions for future cash flows and its impact on the impairment testing of goodwill is a critical accounting estimate.

For our goodwill impairment assessment, we first consider qualitative factors to determine whether the existence of events or circumstances leads to a determination that it is more likely than not (greater than 50 percent chance) that the fair value of a reporting unit is less than its carrying amount (the "step zero" approach). Such qualitative factors may include the following: macroeconomic conditions; industry and market considerations; cost factors; overall financial performance, and other relevant entity specific events. In the absence of sufficient qualitative factors, goodwill impairment is determined utilizing a two step quantitative process. If it is determined that the fair value of a reporting

unit is below its carrying amount, where necessary, goodwill will be impaired at that time.

We performed our annual goodwill impairment assessment as of December 31, 2018 for each of our reporting units except for Active Packaging. Based on our qualitative assessment of macroeconomic, industry, and market events and circumstances as well as the overall financial performance of the reporting units, we determined it was more likely than not that the fair value of these reporting units was greater than their carrying amounts. As such, the annual two step impairment test was deemed not necessary to be performed for our reporting units for the year ended December 31, 2018. While we have not yet performed an impairment assessment for our Active Packaging reporting unit, we did consider whether there were any indicators of possible impairment since the acquisition and did not identify any such factors. We will perform a separate impairment assessment of the Active Packaging reporting unit within one year of the acquisition date.

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INCOME TAXES

In the ordinary course of business, we make estimates of the tax treatment of many transactions, even though the ultimate tax outcome may remain uncertain for some time. These estimates become part of the annual income tax expense reported in our financial statements. Subsequent to year-end, we finalize our tax analysis and file income tax returns. Tax authorities periodically audit these income tax returns and examine our tax filing positions, including (among other things) the timing and amounts of deductions, and the allocation of income among tax jurisdictions. If necessary, we adjust income tax expense in our financial statements in the periods in which the actual outcome becomes more certain.

Our tax liability for unrecognized tax benefits contains uncertainties because management is required to make assumptions and to apply judgment to estimate the exposures related to our various filing positions.

Our effective tax rate is also impacted by changes in tax laws, the current mix of earnings by taxing jurisdiction, and the results of current tax audits and assessments. In December 2017, the U.S. enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (TCJA), which resulted in significant changes to U.S. federal income tax law affecting the Company. Current and expected impacts are based on our current knowledge of the legislation and other authoritative guidance, which has been issued, including proposed regulations.

At December 31, 2018 and 2017, we had \$96.3 million and \$73.6 million, respectively, of net deferred tax assets on our balance sheet primarily related to net operating losses and other tax carryforwards. The ultimate realization of these deferred tax assets is dependent upon the amount, source, and timing of future taxable income. In cases where we believe it is more likely than not that we may not realize the future potential tax benefits, we establish a valuation allowance against them.

Changes in U.S. and foreign tax laws could impact assumptions related to the repatriation of certain foreign earnings. Audits by various taxing authorities continue as governments look for ways to raise additional revenue. Based upon past audit experience, we do not expect any material changes to our tax liability as a result of this audit activity; however, we could incur additional tax expense if we have audit adjustments higher than recent historical experience. The likelihood of recovery of net operating losses and other tax carryforwards has been closely evaluated and is based upon such factors as the time remaining before expiration, viable tax planning strategies, and future taxable earnings expectations. We believe that appropriate valuation allowances have been recorded as necessary. However, if earnings expectations or other assumptions change such that additional valuation allowances are required, we could incur additional tax expense. Likewise, if fewer valuation allowances are needed, we could incur reduced tax expense.

ACQUISITIONS

We account for business combinations using the acquisition method, which requires management to estimate the fair value of identifiable assets acquired and liabilities assumed, and to properly allocate purchase price consideration to the individual assets acquired and liabilities assumed. Goodwill is measured as the excess amount of consideration transferred, compared to fair value of the assets acquired and the liabilities assumed. The allocation of the purchase price utilizes significant estimates and assumptions in determining the fair values of identifiable assets acquired and liabilities assumed, especially with respect to intangible assets. These estimates are based on all available information and in some cases assumptions with respect to the timing and amount of future revenues and expenses associated with an asset. The purchase price allocation for business acquisitions contains uncertainties because it requires management's judgment.

Management applied judgment in determining the fair value of the acquired assets with respect to the acquisition of CSP Technologies S.à r.l. The judgments made in determining the estimated fair value assigned to the assets acquired,

as well as the estimated life of the assets, can materially impact net income in periods subsequent to the acquisition through depreciation and amortization, and in certain instances through impairment charges, if the asset becomes impaired in the future. In particular, judgment was applied with respect to determining the fair value of customer relationships intangible assets, which involved the use of significant estimates and assumptions with respect to the timing and amounts of cash flow projections, the revenue growth rates, the customer attrition rates, the EBITDA margins and the discount rate. We recorded customer relationship intangible assets of approximately \$113 million associated with the CSP Technologies Acquisition.

ALLOWANCE FOR DOUBTFUL ACCOUNTS

We record an allowance for doubtful accounts as an estimate of the inability of our customers to make their required payments. We determine the amount of our allowance for doubtful accounts by looking at a variety of factors. First, we examine an aging report of the accounts receivable for each of our entities. The aging report lists past due amounts according to invoice terms. In addition, we consider historical experience with the customers, the current economic environment, the credit rating of the customers and general overall market conditions. In some countries we maintain credit insurance, which can be used in certain cases of non payment.

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We believe that the accounting estimate related to the allowance for doubtful accounts is a critical accounting estimate because: (1) it requires management to make assumptions about the ability to collect amounts owed from customers in the future and (2) changes to these assumptions or estimates could have a material impact on our results of operations. The estimate for the allowance for doubtful accounts is a critical accounting estimate for all of our segments.

When we determine that a customer is unlikely to pay, we record a charge to bad debt expense in the income statement and an increase to the allowance for doubtful accounts. When it becomes certain the customer cannot pay (typically driven by the customer filing for bankruptcy) we write off the receivable by removing the accounts receivable amount and reducing the allowance for doubtful accounts accordingly. In 2018, we increased the allowance for doubtful accounts by approximately \$923 thousand and we wrote off doubtful accounts of \$543 thousand. Please refer to Schedule II—Valuation and Qualifying Accounts for activity in the allowance for doubtful accounts over the past three years.

At December 31, 2018, we had approximately \$567.1 million in accounts receivable net of approximately \$3.5 million recorded in the allowance for doubtful accounts to cover potential future customer non payments net of any credit insurance reimbursement we would potentially recover. We believe our allowance for doubtful accounts is adequate to cover future non payments of our customers. However, if economic conditions deteriorate significantly or one of our large customers was to declare bankruptcy, a larger allowance for doubtful accounts might be necessary. It is extremely difficult to estimate how much of an additional reserve would be necessary, but we expect the largest potential customer balance at any one time would not exceed \$21.7 million. An additional loss of \$21.7 million would reduce our Total Assets as of December 31, 2018 by approximately 0.6% and would have reduced Income before Income Taxes by approximately 8.1%.

If we had been required to recognize an additional \$21.7 million in bad debt expense, it would likely not have significantly affected our liquidity and capital resources because, in spite of any such additional expense, we would still have been within the terms of our debt covenants.

VALUATION OF PENSION BENEFITS

The benefit obligations and net periodic pension cost associated with our domestic and foreign noncontributory pension plans are determined using actuarial assumptions. Such assumptions include discount rates to reflect the time value of money, rate of employee compensation increases, demographic assumptions to determine the probability and timing of benefit payments, and the long term rate of return on plan assets. The actuarial assumptions are based upon management's best estimates, after consulting with outside investment advisors and actuaries. Because assumptions and estimates are used, actual results could differ from expected results.

The discount rate is utilized principally in calculating our pension obligations, which are represented by the Accumulated Benefit Obligation (ABO) and the Projected Benefit Obligation (PBO), and in calculating net periodic benefit cost. In establishing the discount rate for our foreign plans, we review a number of relevant interest rates including Aa corporate bond yields. In establishing the discount rate for our domestic plans, we match the hypothetical duration of our plans, using a weighted average duration that is based upon projected cash payments, to a simulated bond portfolio (Citigroup Pension Index Curve). At December 31, 2018, the discount rates for our domestic and foreign plans were 4.20% and 1.82%, respectively.

We believe that the accounting estimates related to determining the valuation of pension benefits are critical accounting estimates because: (1) changes in them can materially affect net income and (2) we are required to establish the discount rate and the expected return on fund assets, which are highly uncertain and require judgment. The estimates for the valuation of pension benefits are critical accounting estimates for all of our segments.

To the extent the discount rates increase (or decrease), our PBO and net periodic benefit cost will decrease (or increase) accordingly. The estimated effect of a 1% decrease in each discount rate would be a \$52.7 million increase in the PBO (\$38.1 million for the domestic plans and \$14.6 million for the foreign plans) and a \$8.0 million increase in net periodic benefit cost (\$6.7 million for the domestic plans and \$1.3 million for the foreign plans). To the extent the PBO increases, the after tax effect of such increase could reduce Other Comprehensive Income and Stockholders' Equity. The estimated effect of a 1% increase in each discount rate would be a \$41.6 million decrease in the PBO (\$29.6 million for the domestic plans and \$12.0 million for the foreign plans) and a \$6.3 million decrease in net periodic benefit cost (\$5.3 million for the domestic plans and \$1.0 million for the foreign plans).

The assumed expected long term rate of return on assets is the average rate of earnings expected on the funds invested to provide for the benefits included in the PBO. Of domestic plan assets, approximately 44% was invested in equities, 29% was invested in fixed income securities, 10% was invested in hedge funds, 7% was invested in infrastructure securities, 5% was invested in real estate securities and 5% was invested in money market funds, at December 31, 2018. Of foreign plan assets, approximately 91% was invested in investment funds, 4% was invested in equity securities, 3% was invested in corporate securities, 1% was invested in fixed income securities and 1% was invested in money market funds at December 31, 2018.

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The expected long term rate of return assumptions are determined based on our investment policy combined with expected risk premiums of equities and fixed income securities over the underlying risk free rate. This rate is utilized principally in calculating the expected return on the plan assets component of the net periodic benefit cost. To the extent the actual rate of return on assets realized over the course of a year is greater or less than the assumed rate, that year's net periodic benefit cost is not affected. Rather, this gain (or loss) reduces (or increases) future net periodic benefit cost over a period of approximately 15 to 20 years. To the extent the expected long term rate of return on assets increases (or decreases), our net periodic benefit cost will decrease (or increase) accordingly. The estimated effect of a 1% decrease (or increase) in each expected long term rate of return on assets would be a \$2.2 million increase (or decrease) in net periodic benefit cost.

The average rate of compensation increase is utilized principally in calculating the PBO and the net periodic benefit cost. The estimated effect of a 0.5% decrease in each rate of expected compensation increase would be a \$6.5 million decrease in the PBO (\$1.7 million for the domestic plans and \$4.8 million for the foreign plans) and a \$1.2 million decrease to the net periodic benefit cost. The estimated effect of a 0.5% increase in each rate of expected compensation increase would be a \$7.0 million increase in the PBO (\$1.7 million for the domestic plans and \$5.3 million for the foreign plans) and a \$1.3 million increase to the net periodic benefit cost.

Our primary pension related assumptions as of December 31, 2018, 2017 and 2016 were as follows:

Actuarial Assumptions as of December 31,	2018	2017	2016
Discount rate:			
Domestic plans	4.20 %	3.55 %	4.05 %
Foreign plans	1.82 %	1.62 %	1.65 %
Expected long term rate of return on plan assets:			
Domestic plans	7.00 %	7.00 %	7.00 %
Foreign plans	3.57 %	3.66 %	3.66 %
Rate of compensation increase:			
Domestic plans	4.00 %	4.00 %	4.00 %
Foreign plans	3.01 %	3.02 %	3.00 %

In order to determine the 2019 net periodic benefit cost, we expect to use the discount rates, expected long term rates of return on plan assets and rates of compensation increase assumptions as of December 31, 2018. The estimated impact of the changes to the assumptions as noted in the table above on our 2019 net periodic benefit cost is expected to be a decrease of approximately \$5.7 million.

SHARE BASED COMPENSATION

We use the Black Scholes option valuation model to value stock options, which requires the input of subjective assumptions. These assumptions include the length of time employees will retain their vested stock options before exercising them ("expected term"), the estimated volatility of our stock price, risk free interest rate, the expected dividend yield and stock price. The expected term of the options is based on historical experience of similar awards, giving consideration to the contractual terms, vesting schedules and expectations of future employee behavior. The expected term determines the period for which the risk free interest rate and volatility must be applied. The risk free interest rate is based on the expected U.S. Treasury rate over the expected term. Expected stock price volatility is based on historical volatility of our stock price. Dividend yield is management's long term estimate of annual dividends to be paid as a percentage of share price.

For 2018, expense related to share based compensation for employee stock option plans was \$10.9 million. Future changes in the subjective assumptions used in the Black Scholes option valuation model or estimates associated with forfeitures could impact our share based compensation expense. For example, a one year reduction/increase in the expected term of the options for current year grant would decrease/increase the Black Scholes valuation and reduce/increase share based compensation expense for the year by approximately \$0.3 million. In addition, changes in the share price at the date of the grant would impact our share based compensation expense. For example, a \$5 decrease/increase in the stock price for current year grants would decrease/increase the Black Scholes valuation and reduce/increase share based compensation expense for the year by approximately \$0.2 million. We do not expect to issue stock options after 2018 as we transition our stock compensation plans to a combination of RSUs and PSUs. The amount of the RSUs and PSUs is typically either a flat amount or a percentage of an associate's salary. Various factors dictate the number of shares this equates to but it does not have an impact on the expense.

OPERATIONS OUTLOOK

We anticipate positive sales momentum continuing into the first quarter of 2019 and we expect each segment to post core sales growth over the prior year. Our current first quarter earnings per share guidance range reflects a higher tax rate and higher estimated outstanding share count than the prior year and it also assumes negative foreign currency translation effects as the euro has weakened considerably from a year ago.

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Aptar expects earnings per share for the first quarter, excluding any restructuring costs, to be in the range of \$0.95 to \$1.00 and this guidance is based on an effective tax rate range of 29% to 31%. The midrange of this guidance represents an improvement of approximately 9% over the prior year earnings per share excluding restructuring expenses and adjusted to comparable currency and tax rates. Prior year reported earnings per share were \$0.92.

FORWARD LOOKING STATEMENTS

Certain statements in Management’s Discussion and Analysis and other sections of this Form 10 K are forward looking and involve a number of risks and uncertainties, including certain statements set forth in the Restructuring Initiatives, Liquidity and Capital Resources, Contingencies and Outlook sections of this Form 10 K. Words such as “expects,” “anticipates,” “believes,” “estimates,” “future”, “potential” and other similar expressions or future or conditional verbs such as “will,” “should,” “would” and “could” are intended to identify such forward looking statements. Forward looking statements made pursuant to the safe harbor provisions of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934 and are based on our beliefs as well as assumptions made by and information currently available to us. Accordingly, our actual results may differ materially from those expressed or implied in such forward looking statements due to known or unknown risks and uncertainties that exist in our operations and business environment, including but not limited to:

- economic conditions worldwide, including potential deflationary or inflationary conditions in regions we rely on for growth;
- political conditions worldwide;
- significant fluctuations in foreign currency exchange rates or our effective tax rate;
- the impact of tax reform legislation, changes in tax rates and other tax-related events or transactions that could impact our effective tax rate;
- financial conditions of customers and suppliers;
- consolidations within our customer or supplier bases;
- changes in customer and/or consumer spending levels;
- loss of one or more key accounts;
- the availability of raw materials and components (particularly from sole sourced suppliers) as well as the financial viability of these suppliers;
- fluctuations in the cost of materials, components and other input costs (particularly resin, metal, anodization costs and transportation and energy costs);
- the impact and extent of contamination found at our facility in Brazil;
- our ability to successfully implement facility expansions and new facility projects;
- the impact of the UK leaving the European Union (Brexit) on our UK operations;
- our ability to offset inflationary impacts with cost containment, productivity initiatives or price increases;
- changes in capital availability or cost, including interest rate fluctuations;
- volatility of global credit markets;
- the timing and magnitude of capital expenditures;
- our ability to identify potential new acquisitions and to successfully acquire and integrate such operations or products, including the successful integration of the CSP Technologies and Rebolou businesses;
- direct or indirect consequences of acts of war, terrorism or social unrest;
- cybersecurity threats that could impact our networks and reporting systems;
- the impact of natural disasters and other weather-related occurrences;
- fiscal and monetary policies and other regulations;
- changes or difficulties in complying with government regulation;
- changing regulations or market conditions regarding environmental sustainability;
- work stoppages due to labor disputes;
- competition, including technological advances;

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- our ability to protect and defend our intellectual property rights, as well as litigation involving intellectual property rights;
- the outcome of any legal proceeding that has been or may be instituted against us and others;
- our ability to meet future cash flow estimates to support our goodwill impairment testing;
- the demand for existing and new products;
- the success of our customers' products, particularly in the pharmaceutical industry;
- our ability to manage worldwide customer launches of complex technical products, particularly in developing markets;
- difficulties in product development and uncertainties related to the timing or outcome of product development;
- significant product liability claims;
- the execution of our business transformation plan; and
- other risks associated with our operations.

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Although we believe that our forward looking statements are based on reasonable assumptions, there can be no assurance that actual results, performance or achievements will not differ materially from any future results, performance or achievements expressed or implied by such forward looking statements. Readers are cautioned not to place undue reliance on forward looking statements. We undertake no obligation to update publicly any forward looking statements, whether as a result of new information, future events or otherwise, except as required by law. Please refer to Item 1A (“Risk Factors”) of Part I included in this Form 10 K for additional risk factors affecting the Company.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

MARKET RISKS

A significant number of our operations are located outside of the United States. Because of this, movements in exchange rates may have a significant impact on the translation of the financial condition and results of operations of our subsidiaries. Our primary foreign exchange exposure is to the euro, but we also have foreign exchange exposure to the Chinese yuan, Brazilian real, Mexican peso, Swiss franc and other Asian, European and South American currencies. A weakening U.S. dollar relative to foreign currencies has an additive translation effect on our financial condition and results of operations. Conversely, a strengthening U.S. dollar relative to foreign currencies has a dilutive translation effect on our financial condition and results of operations.

Additionally, in some cases, we sell products denominated in a currency different from the currency in which the related costs are incurred. Any changes in exchange rates on such inter country sales may impact our results of operations.

We manage our exposures to foreign exchange principally with forward exchange contracts to hedge certain firm purchase and sales commitments and intercompany cash transactions denominated in foreign currencies.

The table below provides information as of December 31, 2018 about our forward currency exchange contracts. The majority of the contracts expire before the end of the first quarter of 2019.

In thousands			
Year Ended			
December 31,			
2018			
Buy/Sell	Contract Amount (in thousands)	Average Contractual Exchange Rate	Min / Max Notional Volumes
CHF / EUR	\$ 42,793	0.8878	40,942-42,793
EUR / USD	16,575	1.1404	16,022-38,905
EUR / BRL	12,885	4.4434	12,885-14,127
EUR / INR	5,219	81.1700	4,958-5,231
EUR / IDR	2,354	19.2090	2,252-2,384
USD / EUR	2,242	0.8762	2,242-7,941
USD / MXN	1,570	20.2812	0-1,570
USD / BRL	850	3.8980	0-850
EUR / MXN	535	23.0610	0-535
GBP / EUR	508	1.1277	508-767
EUR / CHF	163	1.1273	0-163

Total \$ 85,695

As of December 31, 2018, we have recorded the fair value of foreign currency forward exchange contracts of \$0.3 million in prepaid and other and \$0.3 million in accounts payable and accrued liabilities in the Consolidated Balance Sheets. Aptar also entered into a EUR/USD floating-to-fixed cross currency swap on July 20, 2017 to effectively hedge the foreign exchange and interest rate exposure on the \$280 million bank term loan drawn by its wholly owned UK subsidiary. The fair value of this cash flow hedge is \$1.0 million and is reported in accounts payable and accrued liabilities in the Consolidated Balance Sheets.

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ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

AptarGroup, Inc.

CONSOLIDATED STATEMENTS OF INCOME

In thousands, except per share amounts

Years Ended December 31,	2018	2017	2016
Net Sales	\$ 2,764,761	\$ 2,469,283	\$ 2,330,934
Operating Expenses:			
Cost of sales (exclusive of depreciation and amortization shown below)	1,812,961	1,603,070	1,496,174
Selling, research & development and administrative	429,955	387,424	366,269
Depreciation and amortization	171,747	153,094	154,802
Restructuring initiatives	63,829	2,208	—
	2,478,492	2,145,796	2,017,245
Operating Income	286,269	323,487	313,689
Other (Expense) Income:			
Interest expense	(32,626)	(40,597)	(35,237)
Interest income	7,056	5,470	2,643
Equity in results of affiliates	(229)	(229)	(191)
Miscellaneous, net	5,550	6,694	(407)
	(20,249)	(28,662)	(33,192)
Income before Income Taxes	266,020	294,825	280,497
Provision for Income Taxes	71,254	74,796	74,893
Net Income	\$ 194,766	\$ 220,029	\$ 205,604
Net (Income) Loss Attributable to Noncontrolling Interests	(21)	1	(14)
Net Income Attributable to AptarGroup, Inc.	\$ 194,745	\$ 220,030	\$ 205,590
Net Income Attributable to AptarGroup, Inc. per Common Share:			
Basic	\$ 3.12	\$ 3.52	\$ 3.27
Diluted	\$ 3.00	\$ 3.41	\$ 3.17

See accompanying notes to consolidated financial statements.

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AptarGroup, Inc.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

In thousands

Year Ended December 31,	2018	2017	2016
Net Income	\$ 194,766	\$ 220,029	\$ 205,604
Other Comprehensive Income:			
Foreign currency translation adjustments	(62,914)	74,404	(53,183)
Changes in treasury locks, net of tax	17	28	26
Gain (loss) on derivatives, net of tax	1,547	(3,186)	—
Defined benefit pension plan, net of tax			
Actuarial gain (loss), net of tax	5,292	(7,906)	(7,151)
Prior service cost, net of tax	(26)	(1,038)	(466)
Amortization of prior service cost included in net income, net of tax	533	296	248
Amortization of net loss included in net income, net of tax	4,991	3,828	3,144
Total defined benefit pension plan, net of tax	10,790	(4,820)	(4,225)
Total other comprehensive (loss) income	(50,560)	66,426	(57,382)
Comprehensive Income	144,206	286,455	148,222
Comprehensive Loss (Income) Attributable to Noncontrolling Interests	16	(18)	6
Comprehensive Income Attributable to AptarGroup, Inc.	\$ 144,222	\$ 286,437	\$ 148,228

See accompanying notes to consolidated financial statements.

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AptarGroup, Inc.

CONSOLIDATED BALANCE SHEETS

In thousands

December 31,	2018	2017
Assets		
Current Assets:		
Cash and equivalents	\$ 261,823	\$ 712,640
Accounts and notes receivable, less allowance for doubtful accounts of \$3,541 in 2018 and \$3,161 in 2017	569,630	510,426
Inventories	381,110	337,216
Prepaid and other	118,245	109,791
	1,330,808	1,670,073
Property, Plant and Equipment:		
Buildings and improvements	453,572	416,241
Machinery and equipment	2,368,332	2,237,655
	2,821,904	2,653,896
Less: Accumulated depreciation	(1,855,810)	(1,811,819)
	966,094	842,077
Land	25,519	25,829
	991,613	867,906
Other Assets:		
Investments in equity securities	25,448	9,444
Goodwill	712,095	443,887
Intangible assets	254,904	95,460
Miscellaneous	62,867	51,053
	1,055,314	599,844
Total Assets	\$ 3,377,735	\$ 3,137,823

See accompanying notes to consolidated financial statements.

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AptarGroup, Inc.

CONSOLIDATED BALANCE SHEETS

In thousands, except share and per share amounts

December 31,	2018	2017
Liabilities and Stockholders' Equity		
Current Liabilities:		
Notes payable, including revolving credit facilities	\$ 101,293	\$ 4,336
Current maturities of long-term obligations, net of unamortized debt issuance costs	62,678	61,833
Accounts payable and accrued liabilities	525,199	461,579
	689,170	527,748
Long-Term Obligations, net of unamortized debt issuance costs	1,125,993	1,191,146
Deferred Liabilities and Other:		
Deferred income taxes	53,917	20,995
Retirement and deferred compensation plans	62,319	80,278
Deferred and other non-current liabilities	23,465	5,608
Commitments and contingencies	—	—
	139,701	106,881
Stockholders' Equity:		
AptarGroup, Inc. stockholders' equity		
Common stock, \$.01 par value, 199 million shares authorized, 67.3 and 66.7 million shares issued as of December 31, 2018 and 2017, respectively	673	667
Capital in excess of par value	678,769	609,471
Retained earnings	1,371,826	1,301,147
Accumulated other comprehensive (loss)	(310,504)	(253,302)
Less: Treasury stock at cost, 4.4 and 4.9 million shares as of December 31, 2018 and 2017, respectively	(318,208)	(346,245)
Total AptarGroup, Inc. Stockholders' Equity	1,422,556	1,311,738
Noncontrolling interests in subsidiaries	315	310
Total Stockholders' Equity	1,422,871	1,312,048
Total Liabilities and Stockholders' Equity	\$ 3,377,735	\$ 3,137,823

See accompanying notes to consolidated financial statements.

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AptarGroup, Inc.

CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY

Years Ended December 31, 2018, 2017 and 2016

In thousands

	AptarGroup, Inc. Stockholders' Equity						
	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Common Stock Par Value	Treasury Stock	Capital in Excess of Par Value	Non-Controlling Interest	Total Equity
Balance - December 31, 2015	\$ 1,185,681	\$ (262,347)	\$ 667	\$ (270,052)	\$ 495,462	\$ 295	\$ 1,149,706
Net income	205,590	—	—	—	—	14	205,604
Foreign currency translation adjustments	—	(53,163)	—	—	—	(20)	(53,183)
Changes in unrecognized pension gains (losses) and related amortization, net of tax	—	(4,225)	—	—	—	—	(4,225)
Changes in treasury locks, net of tax	—	26	—	—	—	—	26
Stock awards and option exercises	—	—	10	19,135	65,198	—	84,343
Cash dividends declared on common stock	(76,659)	—	—	—	—	—	(76,659)
Common stock repurchased and retired	(117,378)	—	(17)	—	(13,976)	—	(131,371)
Non controlling interest additions	—	—	—	—	(2)	3	1

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Balance - December 31, 2016	\$ 1,197,234	\$ (319,709)	\$ 660	\$ (250,917)	\$ 546,682	\$ 292	\$ 1,174,242
Net income	220,030	—	—	—	—	(1)	220,029
Foreign currency translation adjustments	—	74,385	—	—	—	19	74,404
Changes in unrecognized pension gains (losses) and related amortization, net of tax	—	(4,820)	—	—	—	—	(4,820)
Changes in treasury locks, net of tax	—	28	—	—	—	—	28
Changes in derivative losses, net of tax	—	(3,186)	—	—	—	—	(3,186)
Stock awards and option exercises	—	—	12	25,212	67,605	—	92,829
Cash dividends declared on common stock	(79,944)	—	—	—	—	—	(79,944)
Treasury stock purchased	—	—	—	(120,540)	—	—	(120,540)
Common stock repurchased and retired	(36,173)	—	(5)	—	(4,816)	—	(40,994)
Balance - December 31, 2017	\$ 1,301,147	\$ (253,302)	\$ 667	\$ (346,245)	\$ 609,471	\$ 310	\$ 1,312,048
Net income	194,745	—	—	—	—	21	194,766
Adoption of revenue recognition standard	2,937	—	—	—	—	—	2,937
Reclassification of stranded tax effects	6,658	(6,658)	—	—	—	—	—
Foreign currency translation adjustments	—	(62,898)	—	—	—	(16)	(62,914)
Changes in unrecognized pension gains	—	10,790	—	—	—	—	10,790

(losses) and related amortization, net of tax							
Changes in treasury locks, net of tax	—	17	—	—	—	—	17
Changes in derivative gains, net of tax	—	1,547	—	—	—	—	1,547
Stock awards and option exercises	—	—	12	31,942	75,763	—	107,717
Cash dividends declared on common stock	(82,346)	—	—	—	—	—	(82,346)
Treasury stock purchased	—	—	—	(3,905)	—	—	(3,905)
Common stock repurchased and retired	(51,315)	—	(6)	—	(6,465)	—	(57,786)
Balance - December 31, 2018	\$ 1,371,826	\$ (310,504)	\$ 673	\$ (318,208)	\$ 678,769	\$ 315	\$ 1,422,871

See accompanying notes to consolidated financial statements.

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AptarGroup, Inc.

CONSOLIDATED STATEMENTS OF CASH FLOWS

In thousands, brackets denote cash outflows

Year Ended December 31,	2018	2017	2016
Cash Flows from Operating Activities:			
Net income	\$ 194,766	\$ 220,029	\$ 205,604
Adjustments to reconcile net income to net cash provided by operations:			
Depreciation	156,292	142,755	145,485
Amortization	15,455	10,339	9,317
Stock-based compensation	19,561	18,924	19,824
Provision for doubtful accounts	923	235	561
(Gain) loss on disposition of fixed assets	(770)	387	(348)
Gain on remeasurement of equity securities	(6,500)	—	(2,013)
Debt prepayment costs	—	4,710	—
Deferred income taxes	(23,352)	2,238	(11,112)
Defined benefit plan expense	19,501	17,200	16,786
Equity in results of affiliates	229	229	191
Changes in balance sheet items, excluding effects from acquisitions and foreign currency adjustments:			
Accounts and other receivables	(66,968)	(44,658)	(41,721)
Inventories	(25,183)	(12,989)	(834)
Prepaid and other current assets	(9,437)	(33,959)	(5,968)
Accounts payable and accrued liabilities	37,155	58,245	(12,474)
Income taxes payable	(3,155)	(8,753)	15,056
Retirement and deferred compensation plan liabilities	(22,762)	(41,004)	(9,380)
Other changes, net	27,873	(9,199)	(3,675)
Net Cash Provided by Operations	313,628	324,729	325,299
Cash Flows from Investing Activities:			
Capital expenditures	(211,252)	(156,624)	(128,986)
Proceeds from sale of property and equipment	4,466	2,036	1,693
Insurance proceeds	10,631	709	986
Settlement of derivative	—	(66,155)	—
Maturity of short-term investments	—	—	29,485
Acquisition of business, net of cash acquired	(527,916)	—	(202,985)
Acquisition of intangible assets	(611)	—	(2,492)
Proceeds from sale of investment in unconsolidated affiliate	—	—	1,204
Investment in equity securities	(10,000)	(5,000)	—
Notes receivable, net	(779)	234	593
Net Cash (Used) by Investing Activities	(735,461)	(224,800)	(300,502)

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Cash Flows from Financing Activities:			
Proceeds from notes payable	49,069	—	—
Repayments of notes payable	(29,994)	—	—
Proceeds and repayments of short term credit facility, net	81,063	(169,213)	163,148
Proceeds from long-term obligations	13,161	625,628	5,963
Repayments of long-term obligations	(72,290)	(165,798)	(55,314)
Dividends paid	(82,346)	(79,944)	(76,659)
Credit facility costs	—	(3,542)	—
Debt prepayment costs	—	(4,710)	—
Proceeds from stock option exercises	88,156	73,905	55,347
Purchase of treasury stock	(3,905)	(120,540)	—
Common stock repurchased and retired	(57,786)	(40,994)	(131,371)
Excess tax benefit from exercise of stock options	—	—	9,171
Net Cash (Used) Provided by Financing Activities	(14,872)	114,792	(29,715)
Effect of Exchange Rate Changes on Cash	(9,112)	31,632	(18,696)
Net (Decrease) Increase in Cash and Equivalents and Restricted Cash	(445,817)	246,353	(23,614)
Cash and Equivalents and Restricted Cash at Beginning of Period	712,640	466,287	489,901
Cash and Equivalents and Restricted Cash at End of Period	\$ 266,823	\$ 712,640	\$ 466,287
Supplemental Cash Flow Disclosure:			
Interest paid	\$ 32,005	\$ 38,838	\$ 36,265
Income taxes paid	96,048	77,349	82,201

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Restricted cash included in the line item prepaid and other on the Consolidated Balance Sheets as shown below represents amounts held in escrow related to the CSP Technologies acquisition.

Year Ended December 31,	2018	2017	2016
Cash and equivalents	\$ 261,823	\$ 712,640	\$ 466,287
Restricted cash included in prepaid and other	5,000	—	—
Total Cash and Equivalents and Restricted Cash shown in the Statement of Cash Flows	\$ 266,823	\$ 712,640	\$ 466,287

See accompanying notes to consolidated financial statements.

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AptarGroup, Inc.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollars in Thousands, Except Share and per Share Amounts, or as Otherwise Indicated)

NOTE 1 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

BASIS OF PRESENTATION

The accompanying consolidated financial statements include the accounts of AptarGroup, Inc. and our subsidiaries. The terms “AptarGroup”, “Aptar” or “Company” as used herein refer to AptarGroup, Inc. and our subsidiaries. All significant intercompany accounts and transactions have been eliminated. Certain previously reported amounts have been reclassified to conform to the current period presentation.

AptarGroup’s organizational structure consists of three market focused lines of business which are Beauty + Home, Pharma and Food + Beverage. This is a strategic structure which allows us to be more closely aligned with our customers and the markets in which they operate.

In late 2017, Aptar began a business transformation plan to drive profitable sales growth, increase operational excellence, enhance our approach to innovation and improve organizational effectiveness (see Note 21 – Restructuring Initiatives for further details). The primary focus of the plan will be the Beauty + Home segment; however, certain global general and administrative functions will also be addressed. During 2018 and 2017, we recognized approximately \$63.8 million and \$2.2 million, respectively, of restructuring costs related to this plan.

During the quarter ended June 30, 2018, primarily based on published estimates which indicate that Argentina’s three-year cumulative inflation rate has exceeded 100%, we concluded that Argentina has become a highly inflationary economy. Beginning July 1, 2018, we applied highly inflationary accounting for our Argentinian subsidiaries. We have changed the functional currency from the Argentinian peso to the U.S. dollar. Local currency monetary assets and liabilities were remeasured into U.S. dollars using exchange rates as of the latest balance sheet date, with remeasurement adjustments and other transaction gains and losses recognized in net earnings. During the last half of 2018, we recognized approximately \$0.8 million of currency gains due to these changes. Our Argentinian operations contributed approximately 2.0% of consolidated net assets and revenues at and for the year ended December 31, 2018.

ACCOUNTING ESTIMATES

The financial statements are prepared in conformity with accounting principles generally accepted in the United States of America (“U.S. GAAP”). This process requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting period. Actual results could differ from those estimates.

CASH MANAGEMENT

We consider all investments that are readily convertible to known amounts of cash with an original maturity of three months or less when purchased to be cash equivalents.

INVENTORIES

Inventories are stated at lower of cost or net realizable value. Costs included in inventories are raw materials, direct labor and manufacturing overhead.

INVESTMENTS IN EQUITY SECURITIES

We account for our 20% to 50% owned investments using the equity method. Equity investments that do not result in consolidation and are not accounted for under the equity method are measured at fair value. Any related changes in fair value is recognized in net income unless the investments qualify for a practicality exception. During the fourth quarter of 2016, we sold our investment in an injectable drug delivery device company for a \$2.0 million gain. During the first quarter of 2017, we acquired a 20% minority interest in Kali Care, Inc. ("Kali Care") for \$5.0 million. Kali Care is a Silicon Valley-based technology company, which provides digital monitoring systems for ophthalmic medication. In May 2018, we invested \$10.0 million in preferred equity stock of Reciprocal Labs Corporation, doing business as Propeller Health. During 2018, we increased the value of this investment by approximately \$6.5 million due to fair value inputs (see Note 20 – Acquisitions for further details). There were no dividends received from affiliated companies in 2018, 2017 and 2016.

PROPERTY AND DEPRECIATION

Properties are stated at cost. Depreciation is determined on a straight line basis over the estimated useful lives for financial reporting purposes and accelerated methods for income tax reporting. Generally, the estimated useful lives are 10 to 40 years for buildings and improvements and 3 to 15 years for machinery and equipment.

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FINITE LIVED INTANGIBLE ASSETS

Finite lived intangibles, consisting of patents, acquired technology, customer relationships, trademarks and trade names and license agreements acquired in purchase transactions, are capitalized and amortized over their useful lives which range from 1 to 20 years.

GOODWILL

Management believes the excess purchase price over the fair value of the net assets acquired (“goodwill”) in purchase transactions has continuing value. Goodwill is not amortized and must be tested annually, or more frequently as circumstances dictate, for impairment. The annual goodwill impairment test may first consider qualitative factors to determine whether it is more likely than not (i.e., greater than 50 percent chance) that the fair value of a reporting unit is less than its book value. This is sometimes referred to as the “step zero” approach and is an optional step in the annual goodwill impairment analysis. Management has performed this qualitative assessment as of December 31, 2018 for each of our reporting units, except for Active Packaging. Based on our review of macroeconomic, industry, and market events and circumstances as well as the overall financial performance of the reporting units, we determined that it was more likely than not that the fair value of these reporting units was greater than their carrying amounts. While we have not yet performed an impairment assessment for our Active Packaging reporting unit, we did consider whether there were any indicators of possible impairment since the acquisition and did not identify any such factors. We will perform a separate impairment assessment of the Active Packaging reporting unit within one year of the acquisition date.

IMPAIRMENT OF LONG LIVED ASSETS

Long lived assets, such as property, plant and equipment and finite lived intangibles, are evaluated for impairment whenever events or changes in circumstances indicate that the carrying value of an asset may not be recoverable. An impairment loss is recognized when estimated undiscounted future cash flows expected to result from the use of the asset plus net proceeds expected from disposition of the asset (if any) are less than the carrying value of the asset.

DERIVATIVES INSTRUMENTS AND HEDGING ACTIVITIES

Derivative financial instruments are recorded in the consolidated balance sheets at fair value as either assets or liabilities. Changes in the fair value of derivatives are recorded in each period in earnings or other comprehensive income, depending on whether a derivative is designated and effective as part of a hedge transaction.

RETIREMENT OF COMMON STOCK

During 2018, we repurchased 668 thousand shares of common stock, of which 623 thousand shares were immediately retired. During 2017, we repurchased 1.9 million shares of common stock, of which 512 thousand shares were immediately retired. Common stock was reduced by the number of shares retired at \$0.01 par value per share. We allocate the excess purchase price over par value between additional paid-in capital and retained earnings.

RESEARCH & DEVELOPMENT EXPENSES

Research and development costs, net of any customer funded research and development or government research and development credits, are expensed as incurred. These costs amounted to \$75.3 million, \$68.2 million and \$66.2 million in 2018, 2017 and 2016, respectively.

INCOME TAXES

We compute taxes on income in accordance with the tax rules and regulations of the many taxing authorities where the income is earned. The income tax rates imposed by these taxing authorities may vary substantially. Taxable income may differ from pretax income for financial accounting purposes. To the extent that these differences create timing differences between the tax basis of an asset or liability and its reported amount in the financial statements, an appropriate provision for deferred income taxes is made.

During 2018, we finalized our charges related to the impact of the U.S. legislation enacted on December 22, 2017, commonly referred to as the Tax Cuts and Jobs Act (the "TCJA"). These amounts are recorded in accordance with SAB 118, which was issued by the SEC shortly after enactment of the TCJA. We reflected a net benefit of \$5.4 million during the current year, \$2.6 million related to additional guidance with respect to the calculation of the transition tax and \$2.8 million related to the change in the U.S. federal corporate tax rate.

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We consider numerous factors to determine which foreign earnings are indefinitely reinvested in foreign operations. These include the financial requirements of the U.S. parent company and those of our foreign subsidiaries, the U.S. funding needs for dividend payments and stock repurchases, and the tax consequences of remitting earnings. The TCJA imposed a one-time transition tax on all unremitted foreign earnings. As a result of the transition tax and current year GILTI provisions, at December 31, 2018 we do not have a balance of foreign earnings that will be subject to U.S. federal taxation. For investment holdings outside the U.S., we maintain our assertion that the cash and distributable reserves at our non-U.S. affiliates are indefinitely reinvested. We have recorded a \$2.2 million liability for extraordinary distributions to Europe that will occur early in 2019. We continue our assertion for the remaining earnings and do not provide for the withholding and local income taxes that would become due if the amounts were distributed.

We provide a liability for the amount of unrecognized tax benefits from uncertain tax positions. This liability is provided whenever we determine that a tax benefit will not meet a more-likely-than-not threshold for recognition. See Note 6 – Income Taxes for more information.

TRANSLATION OF FOREIGN CURRENCIES

The functional currencies of the majority of our foreign operations are the local currencies. Assets and liabilities of our foreign operations are translated into U.S. dollars at the rates of exchange on the balance sheet date. Sales and expenses are translated at the average rates of exchange prevailing during the year. The related translation adjustments are accumulated in a separate section of Stockholders' Equity. Realized and unrealized foreign currency transaction gains and losses are reflected in income, as a component of miscellaneous income and expense, and represented losses of \$1.7 million, \$5.0 million and \$326 thousand in 2018, 2017 and 2016, respectively.

STOCK-BASED COMPENSATION

Accounting standards require the application of the non-substantive vesting approach which means that an award is fully vested when the employee's retention of the award is no longer contingent on providing future service. Under this approach, compensation costs are recognized over the requisite service period of the award instead of ratably over the vesting period stated in the grant. As such, costs are recognized immediately if the employee is retirement eligible on the date of grant or over the period from the date of grant until retirement eligibility if retirement eligibility is reached before the end of the vesting period stated in the grant. See Note 16 – Stock-Based Compensation for more information.

REVENUE RECOGNITION

The majority of our revenues are derived from product and tooling sales; however, we also receive revenues from service, license, exclusivity and royalty arrangements, which are considered insignificant. Our policy is to recognize revenue from product sales when control has transferred to the customer. For the majority of our products shipped from the U.S., control transfers when the goods leave our shipping locations. For the majority of our products shipped from non-U.S. operations, control transfers when the goods reach their destination. Tooling revenue is also recognized when control transfers to the customer. See specific discussions about methods of accounting for control transfers of product and tooling sales in Note 2 – Revenues.

ADOPTION OF RECENT ACCOUNTING PRONOUNCEMENTS

Changes to U.S. GAAP are established by the Financial Accounting Standards Board ("FASB") in the form of Accounting Standards Updates ("ASUs") to the FASB's Accounting Standards Codification.

In May 2014, the FASB issued ASU 2014-09, which amended the guidance for recognition of revenue from customer contracts. The core principle of the guidance is that an entity should recognize revenue to depict the transfer of promised goods or services to customers in the amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. On January 1, 2018, we adopted this standard and all the related amendments (the “new revenue standard”) for all contracts. This adoption was accounted for using the modified retrospective method. We recognized the cumulative effect of initially applying the new revenue standard as an adjustment to the January 1, 2018 opening balance of retained earnings. Comparative information for the prior periods has not been restated and continues to be reported under the accounting standards in effect prior to January 1, 2018.

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	Balance at December 31, 2017	Adjustment	Balance at January 1, 2018
Consolidated Balance Sheets			
Assets			
Inventories	\$ 337,216	\$ (7,064)	\$ 330,152
Prepaid and other	109,791	6,411	116,202
Liabilities			
Accounts payable and accrued liabilities	461,579	(5,706)	455,873
Deferred income taxes	20,995	1,292	22,287
Deferred and other non-current liabilities	5,608	824	6,432
Stockholders' Equity			
Retained earnings	1,301,147	2,937	1,304,084

A majority of our sales revenue continues to be recognized when products are shipped from our manufacturing facilities. For certain custom product and tooling sales where revenue was previously recognized when the products were shipped, we now recognize revenue over the time required to manufacture the product or build the tool in accordance with the new revenue standard. We also have certain extended warranty contracts, which under the new standard are considered a separate performance obligation and are required to be deferred and recognized into revenue over the life of the agreement.

In accordance with the new revenue standard requirements, the disclosure of the impact of adoption on our consolidated statements of income and balance sheets is as follows:

	For the Year Ended December 31, 2018		
	As Reported	Balances Without Adoption of ASC 606	Effect of Change Higher/(Lower)
Consolidated Statements of Income			
Net Sales			
Beauty + Home	\$ 1,426,382	\$ 1,424,701	\$ 1,681
Pharma	954,652	954,497	155
Food + Beverage	383,727	385,001	(1,274)
Costs and Expenses			
Cost of sales (exclusive of depreciation and amortization)	1,812,961	1,811,290	1,671
Provision for income taxes	71,254	71,541	(287)
Net income	194,766	195,588	(822)

December 31, 2018

As	Balances	
	Without Adoption of	Effect of Change

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	Reported	ASC 606	Higher/(Lower)
Consolidated Balance Sheets			
Assets			
Inventories	\$ 381,110	\$ 391,315	\$ (10,205)
Prepaid and other	118,245	108,490	9,755
Liabilities			
Accounts payable and accrued liabilities	525,199	529,168	(3,969)
Deferred income taxes	53,917	52,912	1,005
Deferred and other non-current liabilities	23,465	23,066	399
Stockholders' Equity			
Retained earnings	1,371,826	1,369,711	2,115

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In January 2016, the FASB issued ASU 2016-01, which provides guidance on the classification and measurement of financial assets and liabilities (equity securities and financial liabilities) under the fair value option and the presentation and disclosure requirements for financial instruments. In February 2018, ASU 2018-03 was issued to clarify certain aspects of the guidance issued in January 2016. The guidance modifies how entities measure equity investments and present changes in the fair value of financial liabilities. Under the new guidance, entities measure equity investments that do not result in consolidation and are not accounted for under the equity method at fair value and recognize any related changes in fair value in net income unless the investments qualify for the new practicality exception. A measurement alternative exists for those equity investments that do not have a readily determinable fair value. These investments may be measured at cost less impairment, if any, plus or minus changes resulting from observable price changes in orderly transactions for identical or similar investments of the same issuer. The standard also includes a new impairment model for equity investments without readily determinable fair values. The new model is a single-step model under which we are required to perform a qualitative assessment each reporting period to identify impairment. When a qualitative assessment indicates that an impairment exists, we will estimate the fair value of the investment and recognize in current earnings an impairment loss equal to the difference between the fair value and the carrying amount of the equity investment. The new standard is effective for fiscal years and interim periods beginning after December 15, 2017. We adopted the requirements of this standard during the first quarter of 2018.

In February 2016, the FASB issued ASU 2016-02 and subsequent amendments, which requires organizations to recognize leases on the balance sheet, and disclose key information about leasing arrangements. The new standard establishes a right-of-use (“ROU”) model that requires a lessee to recognize an ROU asset and lease liability on the balance sheet for all leases with a term longer than 12 months. Leases will be classified as finance or operating, with classification affecting the pattern and recognition of expense in the income statement. The new standard is effective for fiscal years and interim periods beginning after December 15, 2018, with early adoption permitted. We have adopted the new standard on January 1, 2019. A modified retrospective transition approach is required, applying the new standard to all leases existing at the date of initial application. An entity may choose to use either (1) its effective date or (2) the beginning of the earliest comparative period presented in the financial statements as its date of initial application. If an entity chooses the second option, the transition requirements for existing leases also apply to leases entered into between the date of initial application and the effective date. The entity must also recast its comparative period financial statements and provide the disclosures required by the new standard for the comparative periods. We expect to adopt the new standard on January 1, 2019 and use the effective date (option 1) as our date of initial application. Consequently, financial information will not be updated and the disclosures required under the new standard will not be provided for dates and periods before January 1, 2019. The new standard provides a number of optional practical expedients in transition. We expect to elect the ‘package of practical expedients’, which permits us not to reassess under the new standard our prior conclusions about lease identification, lease classification and initial direct costs. The new standard also provides practical expedients for an entity’s ongoing accounting. We currently expect to elect the short-term lease recognition exemption for all leases that qualify. This means, for those leases that qualify, we will not recognize ROU assets or lease liabilities, and this includes not recognizing ROU assets or lease liabilities for existing short-term leases of those assets in transition. While we continue to assess all of the effects of adoption, we currently believe the most significant effects relate to the recognition of new ROU assets and lease liabilities on our balance sheet for our operating leases and the significant new disclosures about our leasing activities.

In August 2016, the FASB issued ASU 2016-15, which provides guidance on the classification of certain cash receipts and cash payments within the statement of cash flows. This guidance provides clarification for the following types of transactions: debt prepayment or extinguishment costs, settlement of zero-coupon debt instruments or other debt instruments with coupon rates that are insignificant in relation to the effective interest rate of the borrowing, contingent consideration payments made after a business combination, proceeds from the settlement of insurance claims, proceeds from the settlement of corporate-owned life insurance, distributions received from equity method investees and beneficial interest in securitization transactions. The guidance also clarifies how the predominance

principle should be applied when cash receipts and cash payments have aspects of more than one class of cash flows. The guidance is effective for fiscal years beginning after December 15, 2017, including interim periods within those fiscal years. However, early adoption was permitted and an entity that elects early adoption must adopt all of the amendments on a retrospective basis in the period of adoption. We adopted this standard in the fourth quarter of 2017.

In November 2016, the FASB issued ASU 2016-18, which provides guidance to address the diversity in the classification and presentation of changes in restricted cash on the statement of cash flows. The amendments in this standard require that a statement of cash flows explain the change during the period in the total cash, cash equivalents, and amounts generally described as restricted cash or restricted cash equivalents. The new standard is effective for fiscal years and interim periods beginning after December 15, 2017. We adopted the requirements of this standard during the first quarter of 2018 and appropriate disclosures are included on the statement of cash flows to the extent applicable.

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In January 2017, the FASB issued ASU 2017-01, which provides guidance to clarify the definition of a business to assist entities in evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. The amendments in this standard provide a screen to determine when an integrated set of assets and activities (collectively referred to as a “set”) is not a business. The screen requires that when substantially all of the fair value of the gross assets acquired (or disposed of) is concentrated in a single identifiable asset or a group of similar identifiable assets, the set is not a business. If the screen is not met, the amendments in this update (1) require that to be considered a business, a set must include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create output and (2) remove the evaluation of whether a market participant could replace missing elements. The amendments also narrow the definition of the term “output” so that the term is consistent with how outputs are described in the new guidance for revenue recognition. The new standard is effective for fiscal years and interim periods beginning after December 15, 2017. We adopted the requirements of this standard during the first quarter of 2018.

In March 2017, the FASB issued ASU 2017-07, which provides guidance to disaggregate the current service cost component from the other components of net periodic benefit costs. The service cost component should be presented within compensation costs while the other components should be presented outside of income from operations. The guidance also clarifies that only the service cost component is eligible for capitalization. The new standard is effective for fiscal years and interim periods beginning after December 15, 2017. We adopted the requirements of this standard during the first quarter of 2018 and the prior periods were restated as follows:

	Original Balance	Adjustment	Revised Balance
Revised Condensed Consolidated Statements of Income			
Year Ended December 31, 2017			
Cost of sales (exclusive of depreciation and amortization)	\$ 1,604,181	\$ (1,111)	\$ 1,603,070
Selling, research & development and administrative	388,281	(857)	387,424
Total Operating Expenses	2,147,764	(1,968)	2,145,796
Operating Income	321,519	1,968	323,487
Miscellaneous, net	8,662	(1,968)	6,694
Total Other (Expense) Income	(26,694)	(1,968)	(28,662)
Income before Income Taxes	294,825	—	294,825
Year Ended December 31, 2016			
Cost of sales (exclusive of depreciation and amortization)	\$ 1,498,070	\$ (1,896)	\$ 1,496,174
Selling, research & development and administrative	367,562	(1,293)	366,269
Total Operating Expenses	2,020,434	(3,189)	2,017,245
Operating Income	310,500	3,189	313,689
Miscellaneous, net	2,782	(3,189)	(407)
Total Other (Expense) Income	(30,003)	(3,189)	(33,192)
Income before Income Taxes	280,497	—	280,497

In May 2017, the FASB issued ASU 2017-09, which provides clarification on applying the standards for stock compensation accounting. The new standard provides guidance on which changes to the terms or conditions of a share-based payment award require an entity to apply modification accounting. The new standard is effective for fiscal years and interim periods beginning after December 15, 2017. We adopted the requirements of this standard during the first quarter of 2018.

In August 2017, the FASB issued ASU 2017-12, which provides new guidance to improve the accounting for hedging activities. The guidance changes the financial reporting of hedging relationships to better portray the economic results of an entity's risk management activities in its financial statements. In addition, the guidance makes certain targeted improvements to simplify the application of the hedge accounting guidance in current U.S. GAAP. The new standard is effective for fiscal years beginning after December 15, 2018 and interim periods within those fiscal years. However, early application is permitted in any interim period after the issuance of this guidance. We adopted this standard in the third quarter of 2017. See details in Note 11 – Derivative Instruments and Hedging Activities.

In February 2018, the FASB issued ASU 2018-02, which provides guidance on the reclassification of certain tax effects from accumulated other comprehensive income. This guidance allows for the reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the TCJA. The new standard is effective for fiscal years and interim periods beginning after December 15, 2018. We elected to early adopt this standard in the fourth quarter of 2018. As part of this adoption, we elected to reclassify \$6.7 million of stranded income tax effects of TCJA from accumulated other comprehensive income to retained earnings at the beginning of the fourth quarter of 2018.

Other accounting standards that have been issued by the FASB or other standards-setting bodies did not have a material impact on our consolidated financial statements.

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NOTE 2 REVENUE

At contract inception, Aptar assesses the goods and services promised in its contracts with customers and identifies a performance obligation for each promise to transfer a good or service (or bundle of goods or services) that is distinct. To identify the performance obligations, we consider all the goods or services promised in the contract, whether explicitly stated or implied based on customary business practices. For a contract that has more than one performance obligation, we allocate the total contract consideration to each distinct performance obligation on a relative standalone selling price basis. Revenue is recognized when (or as) the performance obligations are satisfied (i.e., when the customer obtains control of the good or service). The majority of our revenues are derived from product and tooling sales; however, Aptar also receives revenues from service, license, exclusivity and royalty arrangements, which are considered insignificant. Revenue by segment and geography for the year ended December 31, 2018 is as follows:

Segment	For the Year Ended December 31, 2018				
	Europe	Domestic	Latin America	Asia	Total
Beauty + Home	\$ 816,359	\$ 334,881	\$ 178,392	\$ 96,750	\$ 1,426,382
Pharma	696,079	196,928	25,485	36,160	954,652
Food + Beverage	115,040	194,527	31,742	42,418	383,727
Total	\$ 1,627,478	\$ 726,336	\$ 235,619	\$ 175,328	\$ 2,764,761

Aptar performs its obligations under a contract with a customer by transferring goods and/or services in exchange for consideration from the customer. The timing of performance will sometimes differ from the timing of the receipt of the associated consideration from the customer, thus resulting in the recognition of a contract asset or a contract liability. Aptar recognizes a contract asset when it transfers control of goods or services to a customer prior to invoicing for the related performance obligation. The contract asset is transferred to accounts receivable when the product is shipped and invoiced to the customer. Aptar recognizes a contract liability if the customer's payment of consideration precedes the entity's performance.

The opening and closing balances of Aptar's contract asset and contract liabilities are as follows:

	Balance as of January 1, 2018 (opening)	Balance as of December 31, 2018 (closing)	Increase/ (Decrease)
Contract asset (current)	\$ 13,984	\$ 15,858	\$ 1,874
Contract asset (long-term)	\$ —	\$ —	\$ —
Contract liability (current)	\$ 45,211	\$ 68,134	\$ 22,923

Contract liability (long-term)	\$ 1,476	\$ 11,261	\$ 9,785
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The differences in the opening and closing balances of our contract asset and contract liabilities are primarily the result of acquisitions and timing differences between our performance and the customer's payment. The amount of revenue recognized in the current year that was included in the opening contract liability balance was \$45.2 million.

Determining the Transaction Price

In most cases, the transaction price for each performance obligation is stated in the contract. In determining the variable amounts of consideration within the transaction price (such as volume-based customer rebates), Aptar includes an estimate of the expected amount of consideration as revenue. Aptar applies the expected value method based on all of the information (historical, current and forecast) that is reasonably available and identifies reasonable estimates based on this information. We apply the method consistently throughout the contract when estimating the effect of an uncertainty on the amount of variable consideration to which it will be entitled.

Point in Time Performance Obligations

For product and tooling sales considered to be point in time, Aptar typically assesses, among other things, the shipping terms of the contract, shipping being one of the indicators of transfer of control. For free on board ("FOB") shipping point terms, revenue is recognized at the time of shipment. The performance obligation with respect to the sale of goods is satisfied at the time of shipment because the customer gains control at that time. Once the goods are shipped, we are precluded from redirecting the shipment to another customer. With respect to FOB destination sales, shipping and/or handling costs that occur before the customer obtains control of the goods are deemed to be fulfillment activities and are accounted for as fulfillment costs and revenue is recorded upon final delivery to the customer location.

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Over Time Performance Obligations

For performance obligations related to manufacturing of highly customized products that have no alternative use for us and for which we have an enforceable right to payment for performance completed to date, we transfer control and recognize revenue over time by measuring progress towards complete satisfaction using the Output Method based on the number of products produced. For similar performance obligations related to our tooling sales, we transfer control and recognize revenue over time by measuring progress towards complete satisfaction using the Input Method based on costs incurred relative to total estimated costs to completion. We believe these measurements provide a faithful depiction of the transfer of goods as the costs incurred reflect the value of the products produced.

Product Sales

Aptar primarily manufactures dispensing systems for our Beauty + Home, Pharma and Food + Beverage customers. The amount of consideration is typically fixed for such customers. At the time of delivery, the customer is invoiced the agreed-upon price. Revenue from product sales is typically recognized upon manufacture or shipment, when control of the goods transfers to the customer.

To determine when the control transfers, Aptar typically assesses, among other things, the shipping terms of the contract, shipping being one of the indicators of transfer of control. A majority of product sales are sold FOB shipping point. For FOB shipping point shipments, control of the goods transfers to the customer at the time of shipment of the goods. Therefore, Aptar's performance obligation is satisfied at the time of shipment. Aptar has elected to account for shipping and handling costs that occur after the customer has obtained control of a good as fulfillment costs rather than as a promised service. Aptar does not have any material significant payment terms as payment is typically received shortly after the point of sale.

There also exist instances where Aptar manufactures highly customized products that have no alternative use to Aptar and for which Aptar has an enforceable right to payment for performance completed to date. For these products, we transfer control and recognizes revenue over time by measuring progress towards completion using the Output Method based on the number of products produced. As we normally make our products to a customer's order, the time between production and shipment of our products is typically within a few weeks.

As a part of its customary business practice, Aptar offers a standard warranty that the products will materially comply with the technical specifications and will be free from material defects. Because such warranties are not sold separately, do not provide for any service beyond a guarantee of a product's initial specifications, and are not required by law, there is no revenue deferral for these types of warranties.

Tooling Sales

Aptar also builds or contracts for molds and other tools (collectively defined as "tooling") necessary to produce our products. As with product sales, Aptar recognizes revenue when control of the tool transfers to the customer. If the tooling is highly customized with no alternative use to Aptar and Aptar has an enforceable right to payment for performance completed to date, we transfer control and recognize revenue over time by measuring progress towards completion using the Input Method based on costs incurred relative to total estimated costs to completion. Otherwise, revenue for the tooling is recognized at the point in time when the customer approves the tool. Aptar does not have any material significant payment terms as payment is typically either received during the mold-build process or shortly after completion.

In certain instances, Aptar offers extended warranties on our tools above and beyond the normal standard warranties. Aptar normally receives payment at the inception of the contract and recognizes revenue over the term of the contract.

At January 1, 2018, \$839 thousand of unearned revenue associated with outstanding contracts was reported in Accounts Payable and Other Liabilities. At December 31, 2018, the unearned amount was \$759 thousand. Aptar expects to recognize approximately \$359 thousand of the unearned amount in 2019 and \$400 thousand thereafter.

Contract Costs

Aptar does not incur significant costs to obtain or fulfill revenue contracts.

Practical Expedients

Significant financing component: Aptar elected not to adjust the promised consideration for the time value of money for contracts where the difference between the time of payment and performance is one year or less.

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Remaining performance obligations: Aptar elected not to disclose the aggregate amount of the transaction price allocated to remaining performance obligations for its contracts that are one year or less, as the revenue is expected to be recognized within the next year. In addition, we have elected not to disclose the expected consideration related to performance obligations where we recognize revenue in the amount it has a right to invoice (e.g., usage-based pricing terms).

NOTE 3 INVENTORIES

Inventories, by component net of reserves, consisted of:

	2018	2017
Raw materials	\$ 110,720	\$ 99,196
Work in process	131,091	107,307
Finished goods	139,299	130,713
Total	\$ 381,110	\$ 337,216

NOTE 4 GOODWILL AND OTHER INTANGIBLE ASSETS

The changes in the carrying amount of goodwill for the year ended December 31, 2018 are as follows by reporting segment:

	Beauty + Home	Pharma	Food + Beverage	Corporate & Other	Total
Balance as of December 31, 2016					
Goodwill	\$ 211,371	\$ 180,050	\$ 16,101	\$ 1,615	\$ 409,137
Accumulated impairment losses	—	—	—	(1,615)	(1,615)
	\$ 211,371	\$ 180,050	\$ 16,101	\$ —	\$ 407,522
Foreign currency exchange effects	12,576	23,019	770	—	36,365
Balance as of December 31, 2017					
Goodwill	\$ 223,947	\$ 203,069	\$ 16,871	\$ 1,615	\$ 445,502
Accumulated impairment losses	—	—	—	(1,615)	(1,615)
	\$ 223,947	\$ 203,069	\$ 16,871	\$ —	\$ 443,887

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Acquisition	5,565	174,343	103,678	—	283,586
Reallocation, net	—	(8,048)	8,048	—	—
Foreign currency exchange effects	(5,579)	(9,481)	(318)	—	(15,378)
Balance as of December 31, 2018					
Goodwill	\$ 223,933	\$ 359,883	\$ 128,279	\$ 1,615	\$ 713,710
Accumulated impairment losses	—	—	—	(1,615)	(1,615)
	\$ 223,933	\$ 359,883	\$ 128,279	\$ —	\$ 712,095

During the fourth quarter of 2018, certain CSP Technologies product lines were transferred from Pharma segment to Food + Beverage segment affecting Active Packaging and Food + Beverage reporting units to better align our customer needs. The changes resulted in the reassignment of the assets and liabilities to the reporting units affected. The goodwill was reallocated to the reporting units affected using the relative fair value approach.

We have completed the annual impairment analysis of our reporting units as of December 31, 2018 using a qualitative analysis of goodwill commonly referred to as the “step zero” approach for each of our reporting units except Active Packaging. Based on our review of macroeconomic, industry, and market events and circumstances as well as the overall financial performance of the reporting units, we determined that it was more likely than not that the fair value of these reporting units was greater than their carrying amounts. While we have not yet performed an impairment assessment for our Active Packaging reporting unit, we did consider whether there were any indicators of possible impairment since the acquisition and did not identify any such factors. We will perform a separate impairment assessment of the Active Packaging reporting unit within one year of the acquisition date.

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The table below shows a summary of intangible assets for the years ended December 31, 2018 and 2017.

Weighted Average Amortization Period (Years)	2018 Gross Carrying Amount	Accumulated Amortization	Net Value	2017 Gross Carrying Amount	Accumulated Amortization	Net Value	
Amortized intangible assets:							
Patents	1.6	\$ 5,427	\$ (5,294)	\$ 133	\$ 7,819	\$ (7,806)	\$ 13
Acquired technology	13.5	92,389	(18,304)	74,085	47,571	(14,624)	32,947
Customer relationships	14.3	179,597	(20,439)	159,158	68,886	(13,401)	55,485
Trademarks and trade names	6.9	21,243	(5,914)	15,329	6,965	(4,485)	2,480
License agreements and other	12.0	13,852	(7,653)	6,199	14,862	(10,327)	4,535
Total intangible assets	13.2	\$ 312,508	\$ (57,604)	\$ 254,904	\$ 146,103	\$ (50,643)	\$ 95,460

Aggregate amortization expense for the intangible assets above for the years ended December 31, 2018, 2017 and 2016 was \$15,455, \$10,339 and \$9,317, respectively.

Estimated amortization expense for the years ending December 31 is as follows:

2019	\$ 21,504
2020	22,984
2021	22,088
2022	21,837
2023 and thereafter	166,491

Future amortization expense may fluctuate depending on changes in foreign currency rates. The estimates for amortization expense noted above are based upon foreign exchange rates as of December 31, 2018.

NOTE 5 ACCOUNTS PAYABLE AND ACCRUED LIABILITIES

At December 31, 2018 and 2017, accounts payable and accrued liabilities consisted of the following:

	2018	2017
Accounts payable, principally trade	\$ 164,528	\$ 153,862
Accrued employee compensation costs	168,349	144,175
Customer deposits and other unearned income	67,775	45,196
Other accrued liabilities	124,547	118,346
Total	\$ 525,199	\$ 461,579

NOTE 6 INCOME TAXES

On December 22, 2017, the Tax Cuts and Jobs Act (“TCJA”) was enacted by the U.S. federal government. The legislation lowered the U.S. federal corporate tax rate from 35.0% to 21.0%, effective January 1, 2018 and imposed a one-time transition tax on previously unremitted earnings of non-U.S. subsidiaries as of December 31, 2017.

The SEC issued Staff Accounting Bulletin No. 118 (“SAB 118”), which provided us with up to one year to finalize our accounting for the impacts of U.S. tax reform. We made reasonable estimates of the tax impacts related to the transition tax and the revaluation of deferred tax assets and liabilities. In 2017, we recognized a net tax charge of approximately \$24.7 million, including a provisional charge of \$31.6 million for the transition tax and a provisional benefit of \$6.8 million related to the corporate rate change. We finalized our accounting for these items in 2018, recognizing a \$2.6 million benefit related to the transition tax and a \$2.8 million benefit related to the change in tax rate. We have elected to account for the tax on the U.S. Global Intangible Low Taxed Income (“GILTI”) as a period cost and not as a measure of deferred taxes.

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Income before income taxes consists of:

Years Ended December 31,	2018	2017	2016
United States	\$ 34,404	\$ 36,139	\$ 55,278
International	231,616	258,686	225,219
Total	\$ 266,020	\$ 294,825	\$ 280,497

The provision (benefit) for income taxes is composed of:

Years Ended December 31,	2018	2017	2016
Current:			
U.S. Federal	\$ 10,273	\$ (342)	\$ 24,045
State/Local	877	230	449
International	83,456	72,670	61,511
	\$ 94,606	\$ 72,558	\$ 86,005
Deferred:			
U.S. Federal/State	\$ (17,019)	\$ 2,570	\$ (4,002)
International	(6,333)	(332)	(7,110)
	\$ (23,352)	\$ 2,238	\$ (11,112)
Total	\$ 71,254	\$ 74,796	\$ 74,893

The difference between the actual income tax provision and the tax provision computed by applying the statutory federal income tax rate of 21.0% in 2018, and 35.0% in 2017 and 2016 to income before income taxes is as follows:

Years Ended December 31,	2018	2017	2016
Income tax at statutory rate	\$ 55,864	\$ 103,189	\$ 98,174
State income (benefits) taxes, net of federal (tax) benefit	(1,311)	(594)	(980)
Investment incentives	(1,900)	(1,900)	(6,413)
Tax resolutions	(3,400)	(5,188)	(7,205)
Excess tax benefits from equity compensation	(10,800)	(10,383)	—
Deferred benefits from tax rate changes	(2,800)	(5,055)	—
U.S. GILTI and BEAT	5,625	—	—
U.S. tax reform - transition tax	(2,570)	31,575	—
Results of forward contract	—	(23,883)	—
Rate differential on earnings of foreign operations	29,336	(17,318)	(12,037)
Other items, net	3,210	4,353	3,354
Actual income tax provision	\$ 71,254	\$ 74,796	\$ 74,893
Effective income tax rate	26.8 %	25.4 %	26.7 %

The 2018 tax provision was favorably impacted by excess tax benefits on deductible stock compensation. The tax provision for 2018 reflects a \$10.8 million benefit from this item. The mix of pretax income has an unfavorable impact, reflecting the drop in the U.S. statutory rate to 21.0% for 2018, which is now below the statutory rate of our significant foreign jurisdictions. The U.S. GILTI and BEAT taxes also had a \$5.6 million unfavorable impact.

The 2017 tax provision was favorably impacted by the mix of pretax income in various non-U.S. tax jurisdictions. The tax provision for 2017 reflects \$10.4 million related to the excess tax benefits on deductible stock compensation, which is new for 2017. The deferred tax benefit of \$5.1 million is net of a provisional benefit of \$6.8 million recorded for the change in the U.S. tax rate and a charge of \$1.7 million for tax rate changes in France and Argentina. The \$5.2 million related to tax resolutions includes an amount of \$3.2 million related to uncertain tax positions in Europe. The remaining \$2.0 million is a refund from a distribution tax paid in France. Furthermore, the tax provision for 2017 reflects a provisional charge of \$31.6 million from the transition tax enacted as part of the U.S. tax reform. This was partially offset by a benefit of \$23.9 million from the forward contracts discussed in Note 11 – Derivative Instruments and Hedging Activities.

The state income tax provision for 2016 reflects a benefit of \$1.6 million related to the reduction of valuation allowances mostly associated with U.S. state tax credits. The tax provision for 2016 also reflects benefits of \$6.4 million associated with the exceptional depreciation allowances enacted in France and Italy. The \$7.2 million related to tax resolutions includes an amount of \$5.0 million related to dividends previously taxed in France. The remaining \$2.2 million is a net amount related to uncertain tax positions in France, Italy and Germany. The rate differential on earnings of foreign operations reflects a \$4.7 million benefit due to the reduction in the corporate income tax rate in France from 38.00% to 34.43%. In addition, the rate differential on earnings of foreign operations reflects benefits of \$2.0 million, \$2.2 million, and \$2.2 million due to reductions in the corporate income tax rates in Germany, Switzerland, and China, respectively.

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Significant deferred tax assets and liabilities as of December 31, 2018 and 2017 are composed of the following temporary differences:

	2018	2017
Deferred Tax Assets:		
Net operating loss carryforwards	\$ 22,462	\$ 10,803
Pension liabilities	15,405	19,393
Stock compensation	10,130	9,101
U.S. federal tax credits	12,045	8,320
U.S. state tax credits	10,186	9,384
Vacation and bonus	6,891	4,748
Research and development	6,945	—
Inventory	6,038	3,052
Workers compensation	3,373	4,534
Other	13,985	9,698
Total gross deferred tax assets	107,460	79,033
Less valuation allowance	(11,189)	(5,414)
Net deferred tax assets	96,271	73,619
Deferred Tax Liabilities:		
Depreciation, amortization and leases	33,174	25,062
Acquisition related intangibles	59,004	27,866
Other	10,351	8,090
Total gross deferred tax liabilities	102,529	61,018
Net deferred tax (liabilities) assets	\$ (6,258)	\$ 12,601

The \$5.7 million increase in our valuation allowance in 2018 is primarily due to acquired net operating losses along with current year foreign net operating losses.

The U.S. federal tax credits will expire in the years 2025 and 2027. There is no expiration date on \$18.4 million of the tax effected net operating loss carry forwards and \$4.0 million (tax effected) will expire in the years 2019 to 2038. The U.S. state tax credit carryforwards of \$10.2 million (tax effected) will expire in the years 2019 to 2033. It is currently expected that U.S. state tax credit carryforwards of \$0.9 million will expire unused in 2019.

We evaluate the deferred tax assets and record a valuation allowance when it is believed it is more likely than not that the benefit will not be realized. We have established a valuation allowance of \$8.1 million of the \$22.4 million of tax effected net operating loss carry forwards. These losses are generally in locations that have not produced cumulative three year operating profit. A valuation allowance of \$3.1 million has also been established against the \$10.2 million of U.S. state tax credit carry forwards.

As a result of U.S. tax reform and the U.S. GILTI provisions, none of the non-U.S. unremitted earnings will be subject to U.S. taxation. As of December 31, 2018, we have recognized a \$2.2 million liability for distributions expected to be made to Europe early in 2019. We maintain our assertion that all other cash and distributable reserves at our non-U.S. affiliates will continue to be indefinitely reinvested. We estimate the amount of additional local and withholding tax that would be payable on distributions to be in the range of \$20 million to \$30 million.

We have not provided for taxes on certain tax deferred income of a foreign operation. The income arose predominately from government grants. Taxes of approximately \$1.7 million would become payable in the event the terms of the grant are not fulfilled.

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INCOME TAX UNCERTAINTIES

We provide a liability for the amount of tax benefits realized from uncertain tax positions. A reconciliation of the beginning and ending amount of income tax uncertainties is as follows:

	2018	2017	2016
Balance at January 1	\$ 3,080	\$ 6,356	\$ 7,934
Increases based on tax positions for the current year	360	370	270
Increases based on tax positions of prior years	610	1,562	1,283
Decreases based on tax positions of prior years	—	—	(1,472)
Settlements	(491)	(4,874)	(1,444)
Lapse of statute of limitations	—	(334)	(215)
Balance at December 31	\$ 3,559	\$ 3,080	\$ 6,356

The amount of income tax uncertainties that, if recognized, would impact the effective tax rate is approximately \$3.6 million. We estimate that it is reasonably possible that the liability for uncertain tax positions will decrease no more than \$1.5 million in the next twelve months from the resolution of various uncertain positions as a result of the completion of tax audits, litigation and the expiration of the statute of limitations in various jurisdictions.

We recognize interest and penalties accrued related to unrecognized tax benefits as a component of income taxes. As of December 31, 2018, 2017 and 2016, we had approximately \$1.9 million, \$1.6 million and \$1.5 million, respectively, accrued for the payment of interest and penalties, of which approximately \$0.4 million, \$0.1 million and \$0.4 million was recognized in income tax expense in the years ended December 31, 2018, 2017 and 2016, respectively.

Aptar or its subsidiaries file income tax returns in the U.S. Federal jurisdiction and various state and foreign jurisdictions. The major tax jurisdictions we file in, with the years still subject to income tax examinations, are listed below:

Major Tax Jurisdiction	Tax Years Subject to Examination
United States — Federal	2014-2018
United States — State	2009-2018
France	2016-2018
Germany	2015-2018
Italy	2013-2018
China	2009-2018

NOTE 7 DEBT

We maintain certain short-term notes payable, including revolving credit facilities. These short-term notes payable are reported as notes payable in the current liabilities section of the Consolidated Balance Sheets. Average borrowings under these short-term notes payable were \$40.0 million and \$64.5 million for 2018 and 2017, respectively. The average annual interest rate on short term notes payable remained stable at 1.9% for 2018 and 2017. Our credit facility has a lower interest rate than our short-term borrowings in other countries. There are no compensating balance requirements associated with short term borrowings. Each borrowing under the credit facility will bear interest at rates based on LIBOR, prime rates or other similar rates, in each case plus an applicable margin. A facility fee on the total amount of the facility is also payable quarterly, regardless of usage. The applicable margins for borrowings under the credit facility and the facility fee percentage may change from time to time depending on changes in AptarGroup's consolidated leverage ratio. The outstanding balance under the credit facility was \$79 million and \$0 at December 31, 2018 and 2017, respectively. We incurred approximately \$1.5 million in interest and fees related to this credit facility during both 2018 and 2017, respectively.

We also maintain long-term notes obligations, including private placement facilities. During the third quarter of 2017, we entered into the borrowing arrangements summarized below through our wholly owned UK subsidiary to better balance our capital structure.

Debt Type	Amount	Term/Maturity	Interest Rate
			2.62% USD floating swapped to 1.36% EUR
Bank term loan	\$ 280,000	5 year amortizing/July 2022	fixed
Bank revolver	€ 150,000	5 year/July 2022	1.10% floating
Private placement	€ 100,000	6 year/July 2023	0.98% fixed
Private placement	€ 200,000	7 year/July 2024	1.17% fixed

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The €150 million facility is available to us and €69.0 million was utilized as of December 31, 2018. No balance was utilized as of December 31, 2017. For the year ended December 31, 2018, the floating interest rate of the remaining \$224 million of the original \$280 million bank term loan was 4.0%.

We also maintain a 5-year revolving credit facility that provides for unsecured financing of up to \$300 million and matures in July 2022. No balance was utilized as of December 31, 2018 or 2017. Credit facility balances are included in notes payable, including revolving credit facilities on the Consolidated Balance Sheet.

Our repatriation of foreign earnings to the U.S. in the third quarter of 2017 also enabled us to prepay two of our higher interest private placement facilities during the fourth quarter of 2017: a \$75 million senior unsecured note due in 2018 bearing interest at 6.0% and the \$84 million senior unsecured note due in 2020 bearing interest at 3.8%.

At December 31, 2018, our long term obligations consisted of the following:

	Principal	Unamortized Debt Issuance Costs	Net
Notes payable 0.00% – 16.00%, due in monthly and annual installments through 2028	\$ 15,531	\$ —	\$ 15,531
Senior unsecured notes 3.2%, due in 2022	75,000	88	74,912
Senior unsecured debts 4.0% floating, equal annual installments through 2022	224,000	541	223,459
Senior unsecured notes 3.5%, due in 2023	125,000	181	124,819
Senior unsecured notes 1.0%, due in 2023	114,535	432	114,103
Senior unsecured notes 3.4%, due in 2024	50,000	76	49,924
Senior unsecured notes 3.5%, due in 2024	100,000	181	99,819
Senior unsecured notes 1.2%, due in 2024	229,070	904	228,166
Senior unsecured notes 3.6%, due in 2025	125,000	207	124,793
Senior unsecured notes 3.6%, due in 2026	125,000	208	124,792
Capital lease obligations	8,353	—	8,353
	\$ 1,191,489	\$ 2,818	\$ 1,188,671
Current maturities of long-term obligations	(62,678)	—	(62,678)
Total long-term obligations	\$ 1,128,811	\$ 2,818	\$ 1,125,993

At December 31, 2017, our long-term obligations consisted of the following:

	Principal	Unamortized Debt Issuance Costs	Net
	\$ 15,349	\$ —	\$ 15,349

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Notes payable 0.61% – 18.00%, due in monthly and annual installments through 2025			
Senior unsecured notes 3.2%, due in 2022	75,000	113	74,887
Senior unsecured debts 2.6% floating, equal annual installments through 2022	280,000	692	279,308
Senior unsecured notes 3.5%, due in 2023	125,000	217	124,783
Senior unsecured notes 1.0%, due in 2023	120,095	526	119,569
Senior unsecured notes 3.4%, due in 2024	50,000	89	49,911
Senior unsecured notes 3.5%, due in 2024	100,000	217	99,783
Senior unsecured notes 1.2%, due in 2024	240,190	1,066	239,124
Senior unsecured notes 3.6%, due in 2025	125,000	238	124,762
Senior unsecured notes 3.6%, due in 2026	125,000	238	124,762
Capital lease obligations	741	—	741
	\$ 1,256,375	\$ 3,396	\$ 1,252,979
Current maturities of long-term obligations	(61,833)	—	(61,833)
Total long-term obligations	\$ 1,194,542	\$ 3,396	\$ 1,191,146

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Our revolving credit facility and corporate long-term obligations require us to satisfy certain financial and other covenants including:

	Requirement	Level at December 31, 2018
Consolidated Leverage Ratio (1)	Maximum of 3.50 to 1.00	2.09 to 1.00
Consolidated Interest Coverage Ratio (1)	Minimum of 3.00 to 1.00	14.57 to 1.00

(1) Definitions of ratios are included as part of the revolving credit facility agreement and the private placement agreements.

The aggregate long term maturities, excluding lease obligations, which is discussed in Note 8, due annually for the next five years are \$61,350, \$60,045, \$59,116, \$133,068, \$239,889 and \$629,668 thereafter.

NOTE 8 LEASE COMMITMENTS

We lease certain warehouse, plant, and office facilities as well as certain equipment under noncancelable operating and capital leases expiring at various dates through the year 2027. Most of the operating leases contain renewal options and certain leases include options to purchase during or at the end of the lease term.

Amortization expense related to capital leases is included in depreciation expense while rent expense related to operating leases is included within cost of sales and Selling Research & Development and Administrative expenses (“SG&A”). Rent expense under operating leases (including taxes, insurance and maintenance when included in the rent) amounted to \$32,704, \$30,274 and \$27,360 in 2018, 2017 and 2016, respectively.

Assets recorded under capital leases consist of:

	2018	2017
Land	\$ 333	\$ —
Buildings	13,522	2,415
Machinery and equipment	6,118	2,265
Leasehold	171	—
Furniture	107	—
	\$ 20,251	\$ 4,680
Accumulated depreciation	(3,243)	(2,357)
	\$ 17,008	\$ 2,323

Future minimum payments, by year and in the aggregate, under the capital leases and noncancelable operating leases with initial or remaining terms of one year or more consisted of the following at December 31, 2018:

	Capital Leases	Operating Leases
2019	\$ 1,828	\$ 26,512

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2020	1,653	21,386
2021	1,546	16,529
2022	1,160	12,549
2023	880	10,225
Subsequent to 2023	3,827	21,932
Total minimum lease payments	10,894	\$ 109,133
Amounts representing interest	(2,541)	
Present value of future minimum lease payments	8,353	
Lease amount due in one year	(1,327)	
Total	\$ 7,026	

NOTE 9 RETIREMENT AND DEFERRED COMPENSATION PLANS

We have various noncontributory retirement plans covering certain of our domestic and foreign employees. Benefits under our retirement plans are based on participants' years of service and annual compensation as defined by each plan. Annual cash contributions to fund pension costs accrued under our domestic plans are generally at least equal to the minimum funding amounts required by the Employee Retirement Income Security Act of 1974, as amended ("ERISA"). Certain pension commitments under our foreign plans are also funded according to local requirements or at our discretion.

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The following table presents the changes in the benefit obligations and plan assets for the most recent two years for our domestic and foreign plans.

	Domestic Plans		Foreign Plans	
	2018	2017	2018	2017
Change in benefit obligation:				
Benefit obligation at beginning of year	\$ 198,450	\$ 175,879	\$ 109,030	\$ 93,178
Service cost	11,396	9,706	5,954	5,526
Interest cost	6,878	7,010	1,828	1,747
Special termination benefit charge	—	—	62	—
Curtailment/Settlement	—	—	(1,751)	—
Business acquired	—	—	1,937	—
Prior service cost	—	—	35	1,419
Actuarial loss (gain)	(23,510)	21,085	(3,743)	(2,653)
Benefits paid	(12,411)	(15,230)	(3,288)	(3,489)
Foreign currency translation adjustment	—	—	(5,153)	13,302
Benefit obligation at end of year	\$ 180,803	\$ 198,450	\$ 104,911	\$ 109,030

	Domestic Plans		Foreign Plans	
	2018	2017	2018	2017
Change in plan assets:				
Fair value of plan assets at beginning of year	\$ 169,600	\$ 126,246	\$ 73,384	\$ 61,912
Actual return on plan assets	(7,642)	18,372	(487)	2,472
Employer contribution	20,411	40,212	2,780	3,824
Benefits paid	(12,411)	(15,230)	(3,288)	(3,489)
Foreign currency translation adjustment	—	—	(3,397)	8,665
Fair value of plan assets at end of year	\$ 169,958	\$ 169,600	\$ 68,992	\$ 73,384
Funded status at end of year	\$ (10,845)	\$ (28,850)	\$ (35,919)	\$ (35,646)

The following table presents the funded status amounts recognized in our Consolidated Balance Sheets as of December 31, 2018 and 2017.

	Domestic Plans		Foreign Plans	
	2018	2017	2018	2017
Non-current assets	\$ 207	\$ —	\$ 500	\$ 297
Current liabilities	(430)	(423)	(8)	(9)
Non-current liabilities	(10,622)	(28,427)	(36,411)	(35,934)
	\$ (10,845)	\$ (28,850)	\$ (35,919)	\$ (35,646)

The following table presents the amounts not recognized as components of periodic benefit cost that are recognized in accumulated other comprehensive loss as of December 31, 2018 and 2017.

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	Domestic Plans		Foreign Plans	
	2018	2017	2018	2017
Net actuarial loss	\$ 48,776	\$ 58,260	\$ 29,761	\$ 33,703
Net prior service cost	—	—	4,656	5,341
Tax effects	(17,876)	(20,057)	(4,855)	(12,651)
	\$ 30,900	\$ 38,203	\$ 29,562	\$ 26,393

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Changes in benefit obligations and plan assets recognized in other comprehensive income in 2018, 2017 and 2016 are as follows:

	Domestic Plans		
	2018	2017	2016
Current year actuarial (loss) gain	\$ 4,611	\$ (12,593)	\$ (4,335)
Amortization of net loss	4,873	3,205	3,283
	\$ 9,484	\$ (9,388)	\$ (1,052)

	Foreign Plans		
	2018	2017	2016
Current year actuarial (loss) gain	\$ 534	\$ 2,952	\$ (6,251)
Current year prior service cost	(35)	(1,399)	(656)
Recognition due to curtailment	1,692	—	—
Amortization of net loss	1,716	1,895	1,540
Amortization of prior service cost	720	400	350
	\$ 4,627	\$ 3,848	\$ (5,017)

The following table presents the amounts in accumulated other comprehensive loss as of December 31, 2018 expected to be recognized as components of periodic benefit cost in 2019.

	Domestic Plans	Foreign Plans
Amortization of net loss	\$ 2,009	\$ 1,465
Amortization of prior service cost	—	458
	\$ 2,009	\$ 1,923

Components of net periodic benefit cost:

	Domestic Plans		
	2018	2017	2016
Service cost	\$ 11,396	\$ 9,706	\$ 9,041
Interest cost	6,878	7,010	6,776
Expected return on plan assets	(11,257)	(9,880)	(8,471)
Amortization of net loss	4,873	3,205	3,283
Net periodic benefit cost	\$ 11,890	\$ 10,041	\$ 10,629

Foreign Plans		
2018	2017	2016

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Service cost	\$ 5,954	\$ 5,526	\$ 4,556
Interest cost	1,828	1,747	1,892
Expected return on plan assets	(2,610)	(2,409)	(2,181)
Amortization of net loss	1,716	1,895	1,540
Amortization of prior service cost	720	400	350
Net periodic benefit cost	\$ 7,608	\$ 7,159	\$ 6,157
Curtailment	(59)	—	—
Special termination benefit charge	62	—	—
Total Net periodic benefit cost	\$ 7,611	\$ 7,159	\$ 6,157

The accumulated benefit obligation (“ABO”) for our domestic defined benefit pension plans was \$163.0 million and \$178.9 million at December 31, 2018 and 2017, respectively. The ABO for our foreign defined benefit pension plans was \$80.9 million and \$84.7 million at December 31, 2018 and 2017, respectively.

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The following table provides the projected benefit obligation (“PBO”), ABO, and fair value of plan assets for all pension plans with an ABO in excess of plan assets as of December 31, 2018 and 2017.

	Domestic Plans		Foreign Plans	
	2018	2017	2018	2017
Projected benefit obligation	\$ 11,052	\$ 11,478	\$ 93,029	\$ 89,618
Accumulated benefit obligation	9,216	9,291	68,981	65,524
Fair value of plan assets	—	—	56,611	54,052

The following table provides the PBO, ABO and fair value of plan assets for all pension plans with a PBO in excess of plan assets as of December 31, 2018 and 2017.

	Domestic Plans		Foreign Plans	
	2018	2017	2018	2017
Projected benefit obligation	\$ 11,052	\$ 198,450	\$ 92,555	\$ 84,799
Accumulated benefit obligation	9,216	178,878	68,506	59,383
Fair value of plan assets	—	169,600	56,136	49,233

During 2018, our domestic employee retirement plan has plan assets in excess of the PBO.

Assumptions:

	Domestic Plans			Foreign Plans		
	2018	2017	2016	2018	2017	2016
Weighted-average assumptions used to determine benefit obligations at December 31:						
Discount rate	4.20 %	3.55 %	4.05 %	1.82 %	1.62 %	1.65 %
Rate of compensation increase	4.00 %	4.00 %	4.00 %	3.01 %	3.02 %	3.00 %
Weighted-average assumptions used to determine net periodic benefit cost for years ended December 31:						
Discount rate	3.55 %	4.05 %	4.24 %	1.62 %	1.65 %	2.10 %
Expected long-term return on plan assets	7.00 %	7.00 %	7.00 %	3.66 %	3.66 %	3.66 %
Rate of compensation increase	4.00 %	4.00 %	4.00 %	3.02 %	3.00 %	3.00 %

We develop the expected long term rate of return assumptions based on historical experience and by evaluating input from the plans’ asset managers, including the managers’ review of asset class return expectations and benchmarks, economic indicators and long term inflation assumptions.

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In order to determine the 2019 net periodic benefit cost, we expect to use the December 31, 2018 discount rates, December 31, 2018 rates of compensation increase assumptions and the same assumed long term returns on domestic and foreign plan assets used for the 2018 net periodic benefit cost.

Our domestic and foreign pension plan weighted average asset allocations at December 31, 2018 and 2017 by asset category are as follows:

Plan Assets:

	Domestic Plans Assets at December 31,				Foreign Plans Assets at December 31,			
	2018		2017		2018		2017	
Equity securities	44	%	42	%	4	%	4	%
Fixed income securities	29	%	25	%	1	%	1	%
Corporate debt securities	—		—		3	%	3	%
Infrastructure	7	%	6	%	—		—	
Hedge funds	10	%	9	%	—		—	
Money market	5	%	13	%	1	%	1	%
Investment Funds	—		—		91	%	91	%
Real estate	5	%	5	%	—		—	
Total	100	%	100	%	100	%	100	%

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Our investment strategy for our domestic and foreign pension plans is to maximize the long term rate of return on plan assets within an acceptable level of risk. The investment policy strives to have assets sufficiently diversified so that adverse or unexpected results from one security type will not have an unduly detrimental impact on the entire portfolio and accordingly, establishes a target allocation for each asset category within the portfolio. The domestic plan asset allocation is reviewed on a quarterly basis and the foreign plan asset allocation is reviewed annually. Rebalancing occurs as needed to comply with the investment strategy. The domestic plan target allocation for 2019 is 60% equity securities and 40% fixed income securities and infrastructure. The foreign plan target allocation for 2019 is 100% investment funds.

Authoritative guidelines require the categorization of assets and liabilities into three levels based upon the assumptions (inputs) used to price the assets or liabilities. Level 1 provides the most reliable measure of fair value, whereas Level 3 generally requires significant management judgment. The three levels are defined as follows:

- Level 1: Unadjusted quoted prices in active markets for identical assets and liabilities.
- Level 2: Observable inputs other than those included in Level 1. For example, quoted prices for similar assets or liabilities in active markets or quoted prices for identical assets or liabilities in inactive markets.
- Level 3: Unobservable inputs reflecting management's own assumptions about the inputs used in pricing the asset or liability.

(In Thousands \$)	Domestic Fair Value Measurement at December 31, 2018				Foreign Fair Value Measurement at December 31, 2018			
	Total	(Level 1)	(Level 2)	(Level 3)	Total	(Level 1)	(Level 2)	(Level 3)
Cash and Short-term Securities (a)	\$ 8,964	\$ 8,964	\$ —	\$ —	\$ 718	\$ 718	\$ —	\$ —
USD	—	8,964	—	—	—	—	—	—
EUR	—	—	—	—	—	718	—	—
Equity Securities (a)	\$ 66,707	\$ 66,707	—	—	\$ 2,591	\$ 2,591	—	—
U.S. Large Cap Equities	—	38,804	—	—	—	—	—	—
U.S. Small Cap Equities	—	7,747	—	—	—	—	—	—
International Equities	—	20,156	—	—	—	2,591	—	—
Fixed Income (a&b)	\$ 32,272	\$ 32,272	—	—	\$ 717	\$ 717	—	—
Corporate debts securities	—	—	—	—	\$ 2,097	\$ 2,097	—	—
Euro Corporate Bonds (a)	—	—	—	—	—	2,097	—	—
Investment Funds	—	—	—	—	\$ 62,869	\$ 22,122	\$ 40,747	—
Mutual Funds in Equities (a)	—	—	—	—	—	3,339	—	—
	—	—	—	—	—	18,060	—	—

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Mutual Funds in Bonds (a)								
Mutual Funds Diversified (a&b)	—	—	—	—	—	723	40,747	—
Total Investments in Fair Value Hierarchy	\$ 107,943	\$ 107,943	\$ —	\$ —	\$ 68,992	\$ 28,245	\$ 40,747	\$ —
Investments at Net Asset Value per Share	62,015	—	—	—	—	—	—	—
Total Investments	\$ 169,958	\$ 107,943	\$ —	\$ —	\$ 68,992	\$ 28,245	\$ 40,747	\$ —

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(In Thousands \$)	Domestic Fair Value Measurement at December 31, 2017				Foreign Fair Value Measurement at December 31, 2017			
	Total	(Level 1)	(Level 2)	(Level 3)	Total	(Level 1)	(Level 2)	(Level 3)
Cash and Short-term Securities (a)	\$ 21,644	\$ 21,644	\$ —	\$ —	\$ 432	\$ 432	\$ —	\$ —
USD	—	21,644	—	—	—	—	—	—
EUR	—	—	—	—	—	432	—	—
Equity Securities (a)	\$ 63,799	\$ 63,799	—	—	\$ 3,111	\$ 3,111	—	—
U.S. Large Cap Equities	—	37,456	—	—	—	—	—	—
U.S. Small Cap Equities	—	7,569	—	—	—	—	—	—
International Equities	—	18,774	—	—	—	3,111	—	—
Fixed Income (a&b)	\$ 27,904	\$ 27,904	—	—	\$ 779	\$ 779	—	—
Corporate debts securities	—	—	—	—	\$ 2,256	\$ 2,256	—	—
Euro Corporate Bonds (a)	—	—	—	—	—	2,256	—	—
Investment Funds	—	—	—	—	\$ 66,807	\$ 24,810	\$ 41,997	—
Mutual Funds in Equities (a)	—	—	—	—	—	4,356	—	—
Mutual Funds in Bonds (a)	—	—	—	—	—	19,639	—	—
Mutual Funds Diversified (a&b)	—	—	—	—	—	815	41,997	—
Total Investments in Fair Value Hierarchy	\$ 113,347	\$ 113,347	\$ —	\$ —	\$ 73,384	\$ 31,387	\$ 41,997	\$ —
Investments at Net Asset Value per Share	56,253	—	—	—	—	—	—	—
Total Investments	\$ 169,600	\$ 113,347	\$ —	\$ —	\$ 73,384	\$ 31,387	\$ 41,997	\$ —

(a) Based on third party quotation from financial institution.

(b) Based on observable market transactions.

CONTRIBUTIONS

Annual cash contributions to fund pension costs accrued under our domestic plans are generally at least equal to the minimum funding amounts required by ERISA. We contributed \$20.4 million to our domestic defined benefit plans in 2018 and although we have no minimum funding requirement, we plan to contribute approximately \$0.4 million to pay our ongoing SERP annuity contracts in 2019. Contributions to fund pension costs accrued under our foreign plans

are made in accordance with local laws or at our discretion. We contributed approximately \$2.8 million to our foreign defined benefit plan in 2018 and expect to contribute approximately \$4.3 million in 2019.

ESTIMATED FUTURE BENEFIT PAYMENTS

As of December 31, 2018, we expect the plans to make the following estimated benefit payments relating to our defined benefit plans over the next ten years:

	Domestic Plans	Foreign Plans
2019	\$ 9,929	\$ 4,033
2020	10,380	3,490
2021	10,583	3,409
2022	11,103	3,653
2023	11,644	4,708
2024 - 2028	66,502	31,426

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OTHER PLANS

We have a non-qualified supplemental pension plan for domestic employees which provides for pension amounts that would have been payable from our principal domestic pension plan if it were not for limitations imposed by income tax regulations. The liability for this plan, which is not funded, was \$11.1 million and \$11.5 million at December 31, 2018 and 2017, respectively. This amount is included in the liability for domestic plans shown above.

We have a defined contribution 401(k) employee savings plan available to substantially all domestic employees. Company matching contributions are made in cash up to a maximum of 3% of the participating employee's salary subject to income tax regulations. For each of the years ended December 31, 2018, 2017 and 2016, total contributions made to these plans were approximately \$3.7 million, \$3.3 million and \$3.1 million, respectively.

We have several foreign defined contribution plans, which require us to contribute a percentage of the participating employee's salary according to local regulations. For each of the years ended December 31, 2018, 2017 and 2016, total contributions made to these plans were approximately \$2.4 million, \$2.2 million and \$1.9 million, respectively.

We have no additional postretirement or postemployment benefit plans.

NOTE 10 ACCUMULATED OTHER COMPREHENSIVE INCOME/(LOSS)

Changes in Accumulated Other Comprehensive Income/(Loss) by Component:

	Foreign Currency	Defined Benefit Pension Plans	Derivatives	Total
Balance - December 31, 2015	\$ (206,725)	\$ (55,550)	\$ (72)	\$ (262,347)
Other comprehensive loss before reclassifications	(52,795)	(7,617)	—	(60,412)
Amounts reclassified from accumulated other comprehensive income (loss)	(368)	3,392	26	3,050
Net current-period other comprehensive income	(53,163)	(4,225)	26	(57,362)
Balance - December 31, 2016	\$ (259,888)	\$ (59,775)	\$ (46)	\$ (319,709)
Other comprehensive income (loss) before reclassifications	74,385	(8,944)	(11,806)	53,635
Amounts reclassified from accumulated other comprehensive income	—	4,124	8,648	12,772
Net current-period other comprehensive income	74,385	(4,820)	(3,158)	66,407
Balance - December 31, 2017	\$ (185,503)	\$ (64,595)	\$ (3,204)	\$ (253,302)
Other comprehensive (loss) income before reclassifications	(62,898)	5,266	16,624	(41,008)
	—	5,524	(15,060)	(9,536)

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Amounts reclassified from accumulated other
comprehensive income (loss)

Net current-period other comprehensive income	(62,898)	10,790	1,564	(50,544)
Reclassification of stranded tax effects	—	(6,658)	—	(6,658)
Balance - December 31, 2018	\$ (248,401)	\$ (60,463)	\$ (1,640)	\$ (310,504)

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Reclassifications Out of Accumulated Other Comprehensive Income/(Loss):

Details about Accumulated Other Comprehensive Income Components Year Ended December 31,	Amount Reclassified from Accumulated Other Comprehensive Income			Affected Line in the Statement Where Net Income is Presented
	2018	2017	2016	
Defined Benefit Pension Plans				
Amortization of net loss	\$ 6,589	\$ 5,100	\$ 4,823	(1)
Amortization of prior service cost	720	400	350	(1)
	7,309	5,500	5,173	Total before tax
	(1,785)	(1,376)	(1,781)	Tax benefit
	\$ 5,524	\$ 4,124	\$ 3,392	Net of tax
Foreign Currency				
Foreign currency gain	\$ —	\$ —	\$ (368)	Miscellaneous, net
	—	—	(368)	Total before tax
	—	—	—	Tax benefit
	\$ —	\$ —	\$ (368)	Net of tax
Derivatives				
Changes in treasury locks	\$ 26	\$ 42	\$ 40	Interest Expense
Changes in cross currency swap: interest component	(5,150)	(1,526)	—	Interest Expense
Changes in cross currency swap: foreign exchange component	(13,025)	11,911	—	Miscellaneous, net
	(18,149)	10,427	40	Total before tax
	3,089	(1,779)	(14)	Tax benefit
	\$ (15,060)	\$ 8,648	\$ 26	Net of tax
Total reclassifications for the period	\$ (9,536)	\$ 12,772	\$ 3,050	

(1) These accumulated other comprehensive income components are included in the computation of total net periodic benefit costs, net of tax (see Note 9 - Retirement and Deferred Compensation Plans for additional details).

NOTE 11 DERIVATIVE INSTRUMENTS AND HEDGING ACTIVITIES

We maintain a foreign exchange risk management policy designed to establish a framework to protect the value of our non functional currency denominated transactions from adverse changes in exchange rates. Sales of our products can be denominated in a currency different from the currency in which the related costs to produce the product are denominated. Changes in exchange rates on such inter country sales or intercompany loans can impact our results of operations. Our policy is not to engage in speculative foreign currency hedging activities, but to minimize our net foreign currency transaction exposure defined as firm commitments and transactions recorded and denominated in currencies other than the functional currency. We may use foreign currency forward exchange contracts, options and cross currency swaps to economically hedge these risks.

For derivative instruments designated as hedges, we formally document the nature and relationships between the hedging instruments and the hedged items, as well as the risk management objectives, strategies for undertaking the various hedge transactions, and the method of assessing hedge effectiveness at inception. Quarterly thereafter, we formally assess whether the derivatives that are used in hedging transactions are highly effective in offsetting changes in the fair value or cash flows of the hedged item. Additionally, in order to designate any derivative instrument as a hedge of an anticipated transaction, the significant characteristics and expected terms of any anticipated transaction must be specifically identified, and it must be probable that the anticipated transaction will occur. All derivative financial instruments used as hedges are recorded at fair value in the Consolidated Balance Sheets (See Note 12 – Fair Value).

CASH FLOW HEDGE

For derivative instruments that are designated and qualify as cash flow hedges, the changes in fair values are recorded in accumulated other comprehensive loss and included in changes in derivative gain/loss. The changes in the fair values of derivatives designated as cash flow hedges are reclassified from accumulated other comprehensive loss to net income when the underlying hedged item is recognized in earnings. Cash flows from the settlement of derivative contracts designated as cash flow hedges offset cash flows from the underlying hedged items and are included in operating activities in the Consolidated Statements of Cash Flows.

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As disclosed in Note 7 – Debt, our wholly owned UK subsidiary borrowed \$280 million in term loan borrowings under a new credit facility. In order to mitigate the currency risk of U.S. dollar debt on a euro functional currency entity and to mitigate the risk of variability in interest rates, we entered into a EUR/USD floating-to-fixed cross currency swap on July 20, 2017 in the notional amount of \$280 million to effectively hedge the foreign exchange and interest rate exposure on the \$280 million term loan. Related to this hedge, approximately \$1.6 and \$3.2 million, respectively, of net after-tax loss is included in accumulated other comprehensive loss at December 31, 2018 and 2017. The amount expected to be recognized into earnings during the next 12 months related to the interest component of our cross currency swap, based on prevailing foreign exchange and interest rates at December 31, 2018, is \$5.3 million. The amount expected to be recognized into earnings during the next 12 months related to the foreign exchange component of our cross currency swap is dependent on fluctuations in currency exchange rates. As of December 31, 2018, the fair value of the cross currency swap was a \$1.0 million liability. The swap contract expires on July 20, 2022.

HEDGE OF NET INVESTMENTS IN FOREIGN OPERATIONS

A significant number of our operations are located outside of the United States. Because of this, movements in exchange rates may have a significant impact on the translation of the financial condition and results of operations of our foreign entities. A weakening U.S. dollar relative to foreign currencies has an additive translation effect on our financial condition and results of operations. Conversely, a strengthening U.S. dollar has a dilutive effect. In some cases we maintain debt in these subsidiaries to offset the net asset exposure. We do not otherwise actively manage this risk using derivative financial instruments. In the event we plan on a full or partial liquidation of any of our foreign subsidiaries where our net investment is likely to be monetized, we will consider hedging the currency exposure associated with such a transaction.

OTHER

As of December 31, 2018, we have recorded the fair value of foreign currency forward exchange contracts of \$0.3 million in prepaid and other and \$0.3 million in accounts payable and accrued liabilities in the balance sheet. All forward exchange contracts outstanding as of December 31, 2018 had an aggregate notional contract amount of \$85.7 million.

Fair Value of Derivative Instruments in the Consolidated Balance Sheets as of

December 31, 2018 and December 31, 2017

	Balance Sheet Location	December 31, 2018		December 31, 2017	
		Derivatives not Designated as Hedging Instruments	Derivatives Designated as Hedging Instruments	Derivatives not Designated as Hedging Instruments	Derivatives Designated as Hedging Instruments
Derivative Assets					
Foreign Exchange Contracts	Prepaid and other	\$ —	\$ 259	\$ —	\$ 663
		\$ —	\$ 259	\$ —	\$ 663

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Derivative Liabilities					
Foreign Exchange	Accounts payable				
Contracts	and accrued liabilities	\$ —	\$ 331	\$ —	\$ 1,604
Cross Currency Swap	Accounts payable				
Contract (1)	and accrued liabilities	1,040	—	16,309	—
		\$ 1,040	\$ 331	\$ 16,309	\$ 1,604

(1) This cross currency swap contract is composed of both an interest component and a foreign exchange component.

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The Effect of Cash Flow Hedge Accounting on Accumulated Other Comprehensive Income (Loss) for the Fiscal Years Ended December 31, 2018 and December 31, 2017

Derivatives in Cash Flow Hedging Relationships	Amount of Gain (Loss) Recognized in Other Comprehensive Income on Derivative		Location of (Loss) Gain Recognized in Income on Derivatives	Amount of Gain (Loss) Reclassified from Accumulated Other Comprehensive Income on Derivative		Total Amount of Affected Income Statement Line Item
	2018	2017		2018	2017	
Cross currency swap contract:						
Interest component	\$ 7,014	\$ (2,313)	Interest expense	\$ 5,150	\$ 1,526	\$ (32,626)
Foreign exchange component	13,025	(11,911)	Miscellaneous, net	13,025	(11,911)	5,550
	\$ 20,039	\$ (14,224)		\$ 18,175	\$ (10,385)	

The Effect of Derivatives Not Designated as Hedging Instruments on the Consolidated Statements of Income for the Fiscal Years Ended December 31, 2018 and December 31, 2017

Derivatives Not Designated as Hedging Instruments	Location of (Loss) Gain Recognized in Income on Derivatives	Amount of (Loss) Gain Recognized in Income on Derivatives	
		2018	2017
Foreign Exchange Contracts	Other (Expense) Income: Miscellaneous, net	\$ 652	\$ (65,587)
		\$ 652	\$ (65,587)

Description	Gross Amount	Gross Amounts Offset in the Statement of Financial Position	Net Amounts Presented in the Statement of Financial Position	Gross Amounts not Offset in the Statement of Financial Position		Net Amount
				Instruments	Cash Collateral Received	
December 31, 2018						
Derivative						
Assets	\$ 259	—	\$ 259	—	—	\$ 259
Total Assets	\$ 259	—	\$ 259	—	—	\$ 259
	\$ 1,371	—	\$ 1,371	—	—	\$ 1,371

Derivative Liabilities Total						
Liabilities	\$ 1,371	—	\$ 1,371	—	—	\$ 1,371
December 31, 2017						
Derivative Assets Total Assets	\$ 663	—	\$ 663	—	—	\$ 663
Assets	\$ 663	—	\$ 663	—	—	\$ 663
Derivative Liabilities Total						
Liabilities	\$ 17,913	—	\$ 17,913	—	—	\$ 17,913
Liabilities	\$ 17,913	—	\$ 17,913	—	—	\$ 17,913

As part of our repatriation activities, during the second quarter of 2017 we had a €700 million intercompany receivable balance on a U.S. Dollar functional subsidiary. In order to minimize the foreign currency risk, we executed foreign currency forward contracts to sell euros and receive U.S. Dollars. These foreign currency forward contracts matured on July 27, 2017, which coincided with the date of the planned repatriation and resulted in us delivering €700 million in cash and receiving approximately \$751 million in cash. At maturity, the foreign exchange transaction loss on the forward contract amounted to \$66.2 million. This impact was offset by the revaluation of the €700 million intercompany accounts receivable balance that had \$69.5 million gain during the same period. Therefore, the forward points on these forward contracts had a \$3.3 million favorable impact on other (expense) income miscellaneous, net for 2017.

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NOTE 12 FAIR VALUE

Authoritative guidelines require the categorization of assets and liabilities into three levels based upon the assumptions (inputs) used to price the assets or liabilities. Level 1 provides the most reliable measure of fair value, whereas Level 3 generally requires significant management judgment. The three levels are defined as follows:

- Level 1: Unadjusted quoted prices in active markets for identical assets and liabilities.
- Level 2: Observable inputs other than those included in Level 1. For example, quoted prices for similar assets or liabilities in active markets or quoted prices for identical assets or liabilities in inactive markets.
- Level 3: Unobservable inputs reflecting management's own assumptions about the inputs used in pricing the asset or liability.

As of December 31, 2018, the fair values of our financial assets and liabilities were categorized as follows:

	Total	Level 1	Level 2	Level 3
Assets				
Foreign exchange contracts (1)	\$ 259	\$ —	\$ 259	\$ —
Total assets at fair value	\$ 259	\$ —	\$ 259	\$ —
Liabilities				
Foreign exchange contracts (1)	\$ 331	\$ —	\$ 331	\$ —
Cross currency swap contract (1)	1,040	—	1,040	—
Total liabilities at fair value	\$ 1,371	\$ —	\$ 1,371	\$ —

As of December 31, 2017, the fair values of our financial assets and liabilities were categorized as follows:

	Total	Level 1	Level 2	Level 3
Assets				
Foreign exchange contracts (1)	\$ 663	\$ —	\$ 663	\$ —
Total assets at fair value	\$ 663	\$ —	\$ 663	\$ —
Liabilities				
Foreign exchange contracts (1)	\$ 1,604	\$ —	\$ 1,604	\$ —
Cross currency swap contract (1)	16,309	—	16,309	—
Total liabilities at fair value	\$ 17,913	\$ —	\$ 17,913	\$ —

(1) Market approach valuation technique based on observable market transactions of spot and forward rates. The carrying amounts of our other current financial instruments such as cash and equivalents, accounts and notes receivable, notes payable and current maturities of long term obligations approximate fair value due to the short term maturity of the instrument. We consider our long term obligations a Level 2 liability and utilize the market approach valuation technique based on interest rates that are currently available to us for issuance of debt with similar terms and

maturities. The estimated fair value of our long term obligations was \$1.1 billion as of December 31, 2018 and December 31, 2017. As discussed in Note 20 – Acquisitions, we have a contingent consideration obligation to the selling shareholders of Reboul SAS (“Reboul”) in connection with the Reboul Acquisition (as defined herein) based on 2018 earnings before net interest, taxes, depreciation and amortization (“EBITDA”). We consider this a Level 3 liability; however, we estimated the aggregate fair value for this contingent consideration arrangement to be zero as of December 31, 2018.

NOTE 13 COMMITMENTS AND CONTINGENCIES

In the normal course of business, we are subject to a number of lawsuits and claims both actual and potential in nature. While management believes the resolution of these claims and lawsuits will not have a material adverse effect on our financial position or results of operations or cash flows, claims and legal proceedings are subject to inherent uncertainties, and unfavorable outcomes could occur that could include amounts in excess of any accruals which management has established. Were such unfavorable final outcomes to occur, it is possible that they could have a material adverse effect on our financial position, results of operations and cash flows.

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Under our Certificate of Incorporation, we have agreed to indemnify our officers and directors for certain events or occurrences while the officer or director is, or was, serving at our request in such capacity. The maximum potential amount of future payments we could be required to make under these indemnification agreements is unlimited; however, we have a directors and officers liability insurance policy that covers a portion of our exposure. As a result of our insurance policy coverage, we believe the estimated fair value of these indemnification agreements is minimal. We have no liabilities recorded for these agreements as of December 31, 2018.

An environmental investigation, undertaken to assess areas of possible contamination, was completed at our facility in Jundiaí, São Paulo, Brazil. The facility is primarily an internal supplier of anodized aluminum components for certain of our dispensing systems. The testing indicated that soil and groundwater in certain areas of the facility were impacted above acceptable levels established by local regulations. In March 2017, we reported the findings to the relevant environmental authority, the Environmental Company of the State of São Paulo – CETESB. We continue to monitor and test the affected areas to determine the full extent of the impact and the scope of any required remediation. Initial costs for further investigation and possible remediation, which are based on assumptions about the area of impact and customary remediation costs, are estimated to be in the range of \$1.5 million to \$3.0 million. The range of possible loss associated with this environmental contingency is subject to considerable uncertainty due to the incomplete status of the investigation and ongoing review with the CETESB. We will continue to evaluate the range of likely costs as the investigation proceeds and we have further clarity on the nature and extent of remediation that will be required. We note that the contamination, or any failure to complete any required remediation in a timely manner, could potentially result in fines or penalties. We accrued \$1.5 million (operating expense) in the first quarter of 2017 relating to this contingency. The amount is periodically reviewed, and adjusted as necessary, as the matter continues to evolve. Based on the current status of the investigation, no adjustment to the accrual was necessary for the year ended December 31, 2018.

In March 2017, the Supreme Court of Brazil issued a decision that a certain state value added tax should not be included in the calculation of federal gross receipts taxes. The decision reduces our gross receipts tax in Brazil prospectively and, potentially, retrospectively. If the Judicial Court grants full retrospective recovery, we estimate potential recoveries of up to \$16.1 million, including interest. During the fourth quarter of 2018, we received a favorable court decision of \$631 thousand for the retrospective right to recover part of our claim. Due to uncertainties around our remaining court recovery requests, we have not recorded any further amounts relating to the retrospective nature of this matter. However, we anticipate decisions on our remaining claims during 2019.

NOTE 14 STOCK REPURCHASE PROGRAM

On October 20, 2016, we announced a share repurchase authorization of up to \$350 million of common stock. This authorization replaced previous authorizations and has no expiration date. Aptar may repurchase shares through the open market, privately negotiated transactions or other programs, subject to market conditions.

In 2018 and 2017, we repurchased approximately 668 thousand and 1.9 million shares of our outstanding common stock at a total cost of \$61.7 million and \$161.5 million, respectively. As of December 31, 2018, there was \$80.2 million of authorized share repurchases available to us.

NOTE 15 CAPITAL STOCK

We have 199 million authorized shares of common stock. The number of shares of common stock and treasury stock and the share activity were as follows:

Common Shares

Treasury Shares

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	2018	2017	2018	2017
Balance at the beginning of the year	66,742,490	66,012,843	4,881,889	3,865,863
Employee option exercises	1,182,547	1,173,936	(502,005)	(394,991)
Restricted stock vestings	39,691	67,708	—	—
Common stock repurchases	—	—	45,000	1,411,017
Common stock repurchased and retired	(623,412)	(511,997)	—	—
Balance at the end of the year	67,341,316	66,742,490	4,424,884	4,881,889

The cash dividends paid on the common stock for the years ended December 31, 2018, 2017 and 2016 aggregated \$82.3 million, \$79.9 million and \$76.7 million, respectively.

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NOTE 16 STOCK BASED COMPENSATION

We issue stock options and restricted stock units (“RSUs”), which consist of time-based and performance-based awards, to employees under stock awards plans approved by stockholders. In addition, RSUs are issued to non-employee directors under a Restricted Stock Unit Award Agreement for Directors pursuant to the 2018 Equity Incentive Plan. Previously, non-employee directors were issued stock options under a Director Stock Option Plan. Stock options are awarded with the exercise price equal to the market price on the date of grant and generally vest over three years and expire 10 years after grant.

RSUs granted to employees vest according to a specified performance period and/or vesting period. Time-based RSUs generally vest over three years. Performance-based RSUs vest at the end of the specified performance period, generally three years, assuming required performance or market vesting conditions are met. Performance-based RSUs have one of two vesting conditions: (1) based on Aptar’s internal financial performance metrics and (2) based on Aptar’s total shareholder return (“TSR”) relative to total shareholder returns of an industrial peer group, subject to discretion if the overall TSR is negative at the conclusion of the performance period. At the time of vesting, Aptar will issue or cause to be issued in the employee’s name the vested shares of common stock. In addition, RSU awards are generally net settled (shares are withheld to cover the employee tax obligation). Director RSUs are only time-based and generally vest over one year.

Compensation expense recorded attributable to stock options for the year ended December 31, 2018 was approximately \$10.9 million (\$8.4 million after tax). The income tax benefit related to this compensation expense was approximately \$2.5 million. Approximately \$8.7 million of the compensation expense was recorded in SG&A expenses and the balance was recorded in cost of sales. Compensation expense recorded attributable to stock options for the year ended December 31, 2017 was approximately \$15.2 million (\$10.5 million after tax). The income tax benefit related to this compensation expense was approximately \$4.7 million. Approximately \$13.2 million of the compensation expense was recorded in SG&A and the balance was recorded in cost of sales. Compensation expense recorded attributable to stock options for the year ended December 31, 2016 was approximately \$16.9 million (\$11.3 million after tax). The income tax benefit related to this compensation expense was approximately \$5.6 million. Approximately \$15.0 million of the compensation expense was recorded in SG&A expenses and the balance was recorded in cost of sales.

We use historical data to estimate expected life and volatility. The weighted average fair value of stock options granted under the Stock Awards Plans was \$14.82, \$11.86 and \$10.59 per share in 2018, 2017 and 2016, respectively. These values were estimated on the respective dates of grant using the Black Scholes option pricing model with the following weighted average assumptions:

Stock Awards Plans:						
Years Ended December 31,	2018	2017	2016			
Dividend Yield	1.5	1.7	1.8	%	%	%
Expected Stock Price Volatility	14.2	15.8	16.9	%	%	%
Risk-free Interest Rate	2.8	2.2	1.6	%	%	%
Expected Life of Option (years)	6.6	6.7	6.7			

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A summary of option activity under our stock plans as of December 31, 2018, and changes during the period then ended is presented below:

	Stock Awards Plans		Director Stock Option Plans	
	Options	Weighted Average Exercise Price	Options	Weighted Average Exercise Price
Outstanding, January 1, 2018	8,059,319	\$ 61.67	214,967	\$ 57.44
Granted	603,901	88.39	—	—
Exercised	(1,631,218)	52.35	(59,767)	55.64
Forfeited or expired	(270,947)	75.12	—	—
Outstanding at December 31, 2018	6,761,055	\$ 65.76	155,200	\$ 58.13
Exercisable at December 31, 2018	4,922,937	\$ 61.08	155,200	\$ 58.13
Weighted-Average Remaining Contractual Term (Years):				
Outstanding at December 31, 2018	5.9		4.1	
Exercisable at December 31, 2018	5.0		4.1	
Aggregate Intrinsic Value:				
Outstanding at December 31, 2018	\$ 191,374		\$ 5,577	
Exercisable at December 31, 2018	\$ 162,424		\$ 5,577	
Intrinsic Value of Options Exercised During the Years Ended:				
December 31, 2018	\$ 72,951		\$ 2,286	
December 31, 2017	\$ 51,140		\$ 1,995	
December 31, 2016	\$ 44,972		\$ 548	

The grant date fair value of options vested during the years ended December 31, 2018, 2017 and 2016 was \$16.5 million, \$16.9 million and \$17.2 million, respectively. Cash received from option exercises was approximately \$88.2 million and the actual tax benefit realized for the tax deduction from option exercises was approximately \$17.7 million in the year ended December 31, 2018. As of December 31, 2018, the remaining valuation of stock option awards to be expensed in future periods was \$8.4 million and the related weighted average period over which it is expected to be recognized is 1.5 years.

The fair value of both time-based RSUs and performance-based RSUs pertaining to internal performance metrics is determined using the closing price of our common stock on the grant date. The fair value of performance-based RSUs pertaining to TSR is estimated using a Monte Carlo simulation. Inputs and assumptions used to calculate the fair value are shown in the table below. The fair value of these RSUs is expensed over the vesting period using the straight-line method or using the graded vesting method when an employee becomes eligible to retain the award at retirement.

Year Ended December 31,	2018
Fair value per stock award	\$ 128.70
Grant date stock price	\$ 89.42
Assumptions:	
Aptar's stock price expected volatility	12.30 %
Expected average volatility of peer companies	27.50 %

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Correlation assumption	20.20	%
Risk-free interest rate	2.42	%
Dividend yield assumption	1.43	%

A summary of RSU activity as of December 31, 2018, and changes during the period then ended is presented below:

	Time-Based RSUs		Performance-Based RSUs	
	Units	Weighted Average Grant-Date Fair Value	Units	Weighted Average Grant-Date Fair Value
Nonvested at January 1, 2018	124,067	\$ 74.65	—	\$ —
Granted	208,783	96.79	80,843	111.55
Vested	(39,691)	75.09	—	—
Forfeited	(31,672)	78.62	(10,853)	111.55
Nonvested at December 31, 2018	261,487	\$ 91.78	69,990	\$ 111.55

Included in the December 31, 2018 time-based RSUs are 14,257 units awarded to non-employee directors and 14,793 units vested related to non-employee directors.

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Compensation expense recorded attributable to RSUs for the years ended December 31, 2018, 2017 and 2016 was approximately \$8.7 million, \$3.7 million and \$3.0 million, respectively. The actual tax benefit realized for the tax deduction from RSUs was approximately \$0.7 million for the year ended December 31, 2018. The fair value of units vested during the years ended December 31, 2018, 2017 and 2016 was \$3.0 million, \$4.7 million and \$1.9 million, respectively. The intrinsic value of units vested for the years ended December 31, 2018, 2017 and 2016 was \$3.7 million, \$5.2 million and \$2.3 million, respectively. As of December 31, 2018, there was \$20.6 million of total unrecognized compensation cost relating to RSU awards which is expected to be recognized over a weighted average period of 2.3 years.

We have a long-term incentive program for certain employees. Each award is based on the cumulative TSR of our common stock during a three year performance period compared to a peer group. The total expected expense related to this program for awards outstanding as of December 31, 2018 is approximately \$2.8 million. For the years ended December 31, 2018, 2017 and 2016, we recognized expense of \$2.3 million, expense of \$1.5 million and income of \$1.0 million, respectively.

NOTE 17 EARNINGS PER SHARE

Basic net income per share is calculated by dividing net income attributable to Aptar by the weighted-average number of common shares outstanding during the period. Diluted net income per share is calculated by dividing the net income attributable to Aptar by the weighted-average number of common and common equivalent shares outstanding during the applicable period. The difference between basic and diluted earnings per share is attributable to stock based compensation awards. Share-based compensation awards for which total employee proceeds exceed the average market price over the applicable period would have an antidilutive effect on earnings per share, and accordingly, are excluded from the calculation of diluted earnings per share. The reconciliation of basic and diluted earnings per share ("EPS") for the years ended December 31, 2018, 2017 and 2016 are as follows:

	Income (Numerator)	Shares (Denominator)	Per Share Amount
For the Year Ended December 31, 2018			
Basic EPS			
Income available to common stockholders	\$ 194,745	62,437	\$ 3.12
Effect of Dilutive Securities			
Stock options		2,440	
Restricted stock		81	
Diluted EPS			
Income available to common stockholders	\$ 194,745	64,958	\$ 3.00
For the Year Ended December 31, 2017			
Basic EPS			
Income available to common stockholders	\$ 220,030	62,435	\$ 3.52
Effect of Dilutive Securities			
Stock options		2,106	
Restricted stock		55	
Diluted EPS			
Income available to common stockholders	\$ 220,030	64,596	\$ 3.41
For the Year Ended December 31, 2016			
Basic EPS			
Income available to common stockholders	\$ 205,590	62,804	\$ 3.27
Effect of Dilutive Securities			

Stock options		1,988	
Restricted stock		57	
Diluted EPS			
Income available to common stockholders	\$ 205,590	64,849	\$ 3.17

NOTE 18 SEGMENT INFORMATION

We are organized into three reporting segments. Operations that sell dispensing systems and sealing solutions primarily to the beauty, personal care and home care markets form the Beauty + Home segment. Operations that sell dispensing systems and sealing solutions to the prescription drug, consumer health care, injectables and active packaging markets form the Pharma segment. Operations that sell dispensing systems and sealing solutions to the food and beverage markets form the Food + Beverage segment. CSP Technologies' financial results are reported in the Pharma and Food + Beverage segments.

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The accounting policies of the segments are the same as those described in Note 1 – Summary of Significant Accounting Policies. In order to more closely align with how the markets analyze our segment results, we have changed our non-U.S. GAAP segment measure of profitability from Segment Income to Adjusted EBITDA beginning in 2018. All internal segment reporting and discussions of results with our Chief Operating Decision Maker (CODM) are now based on segment Adjusted EBITDA. All references to segment profitability have been updated for this change.

Financial information regarding our reporting segments is shown below:

Year Ended December 31,	2018	2017	2016
Total Sales:			
Beauty + Home	\$ 1,446,231	\$ 1,333,048	\$ 1,278,151
Pharma	955,069	805,913	741,473
Food + Beverage	386,689	352,483	330,231
Total Sales	\$ 2,787,989	\$ 2,491,444	\$ 2,349,855
Less: Intersegment Sales:			
Beauty + Home	\$ 19,849	\$ 19,262	\$ 17,065
Pharma	417	33	—
Food + Beverage	2,962	2,866	1,856
Total Intersegment Sales	\$ 23,228	\$ 22,161	\$ 18,921
Net Sales:			
Beauty + Home	\$ 1,426,382	\$ 1,313,786	\$ 1,261,086
Pharma	954,652	805,880	741,473
Food + Beverage	383,727	349,617	328,375
Net Sales	\$ 2,764,761	\$ 2,469,283	\$ 2,330,934
Adjusted EBITDA (1):			
Beauty + Home	\$ 185,926	\$ 173,227	\$ 186,993
Pharma	343,706	275,933	259,241
Food + Beverage	57,589	62,903	61,588
Corporate & Other, unallocated	(36,285)	(37,457)	(31,712)
Acquisition-related costs (2)	(23,770)	—	(8,217)
Restructuring Initiatives (3)	(63,829)	(2,208)	—
Gain on insurance recovery (4)	—	10,648	—
Depreciation and amortization	(171,747)	(153,094)	(154,802)
Interest Expense	(32,626)	(40,597)	(35,237)
Interest Income	7,056	5,470	2,643
Income before Income Taxes	\$ 266,020	\$ 294,825	\$ 280,497
Depreciation and Amortization:			
Beauty + Home	\$ 83,546	\$ 79,422	\$ 84,273
Pharma	51,495	41,143	39,776
Food + Beverage	27,467	24,720	23,891
Corporate & Other	9,239	7,809	6,862
Depreciation and Amortization	\$ 171,747	\$ 153,094	\$ 154,802
Capital Expenditures:			
Beauty + Home	\$ 101,371	\$ 76,425	\$ 75,165
Pharma	54,433	33,005	58,970

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Food + Beverage	41,236	38,730	21,533
Corporate & Other	25,739	18,924	17,490
Transfer of Corporate Technology Expenditures (5)	(11,527)	(10,460)	(44,172)
Capital Expenditures	\$ 211,252	\$ 156,624	\$ 128,986
Total Assets:			
Beauty + Home	\$ 1,373,816	\$ 1,358,283	\$ 1,270,858
Pharma	1,324,696	881,443	831,569
Food + Beverage	501,700	296,271	259,282
Corporate & Other	177,523	601,826	245,076
Total Assets	\$ 3,377,735	\$ 3,137,823	\$ 2,606,785

-
- (1) We evaluate performance of our business units and allocates resources based upon Adjusted EBITDA. Adjusted EBITDA is defined as earnings before net interest, taxes, depreciation, amortization, unallocated corporate expenses, restructuring, acquisition-related costs and insurance recoveries.
- (2) Acquisition-related costs include transaction costs and purchase accounting adjustments related to inventory for acquisitions (see Note 20 – Acquisitions for further details).

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- (3) Restructuring Initiatives includes expense items for the years ended December 31, 2018 and 2017 as follows (see Note 21 – Restructuring Initiatives for further details):

Year Ended December 31,	2018	2017
Restructuring Initiatives by Segment		
Beauty + Home	\$ 52,244	\$ 529
Pharma	3,589	—
Food + Beverage	4,185	1,679
Corporate & Other	3,811	—
Total Restructuring Initiatives	\$ 63,829	\$ 2,208

- (4) The gain on insurance recovery relates to the Ancey fire (see Note 19 – Insurance Settlement Receivable for further details).
- (5) The transfer of corporate technology expenditures represents amounts of projects managed by corporate for the benefit of specific entities within each segment. Once the projects are complete, all related costs are allocated from corporate to and paid by the appropriate entity and the associated assets are then depreciated at the entity level.

GEOGRAPHIC INFORMATION

The following are net sales and long lived asset information by geographic area and product information for the years ended December 31, 2018, 2017 and 2016:

	2018	2017	2016
Net Sales to Unaffiliated Customers (1):			
United States	\$ 726,336	\$ 642,164	\$ 619,814
Europe:			
France	862,364	744,856	695,727
Germany	474,369	416,802	386,553
Italy	144,044	131,523	126,890
Other Europe	146,701	132,992	120,228
Total Europe	1,627,478	1,426,173	1,329,398
Other Foreign Countries	410,947	400,946	381,722
Total	\$ 2,764,761	\$ 2,469,283	\$ 2,330,934
Property, Plant and Equipment			
United States	\$ 265,004	\$ 182,434	\$ 175,578
Europe:			
France	308,250	266,804	228,082
Germany	154,505	163,948	154,588
Italy	54,978	57,080	51,732
Other Europe	59,411	59,963	54,575
Total Europe	577,144	547,795	488,977
Other Foreign Countries	149,465	137,677	119,766
Total	\$ 991,613	\$ 867,906	\$ 784,321

- (1) Sales are attributed to countries based upon where the sales invoice to unaffiliated customers is generated.

No single customer represents 6% or more of our net sales in 2018, 2017 or 2016.

NOTE 19 INSURANCE SETTLEMENT RECEIVABLE

A fire caused damage to Aptar's facility in Annecy, France in June 2016. The fire was contained to one of three production units and there were no reported injuries. Aptar Annecy supplies anodized aluminum components for certain Aptar dispensing systems. While repairs are underway, Aptar sources from its network of suppliers as well as from its anodizing facility in Brazil. We are insured for the damages caused by the fire, including business interruption insurance, and we do not expect this incident to have a material impact on our financial results.

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Losses related to the Ancey fire of \$18.9 million and \$20.3 million were incurred during 2018 and 2017, respectively. For the year ended December 31, 2018, we received insurance proceeds of \$24.2 million. We have established an insurance receivable of \$3.4 million as of December 31, 2018, for known losses, which is included in Prepaid and Other in the Consolidated Balance Sheet. In many cases, our insurance coverage exceeds the amount of these incurred losses. Operating Income was negatively impacted by \$5.8 million during 2018. These 2018 losses negatively impacted the Beauty + Home and Pharma segments by \$3.8 million and \$2.0 million, respectively. Operating income was negatively impacted by \$5.6 million during 2017. During 2017, we also recognized \$10.6 million of gain due to the insurance recovery on the involuntary conversion of fixed assets related to this fire, which is included in Other (Expense) Income on the Consolidated Statements of Income. These 2017 amounts impacted the Beauty + Home segment.

A separate fire caused damage to the roof and production area of one of our facilities in Brazil in September 2014. There were no injuries. The facility is primarily an internal supplier of anodized aluminum components for certain dispensing systems sold to the regional beauty and personal care markets. Repairs of the facility were essentially completed in the fourth quarter 2015. AptarGroup was insured for the damages caused by the fire, including business interruption insurance. The final insurance settlement was received in the fourth quarter of 2016. During 2016, we recognized \$559 thousand of gain related to this fire, which is included in Other (Expense) Income on the Consolidated Statements of Income.

NOTE 20 ACQUISITIONS

On August 27, 2018, we completed our acquisition (the “CSP Technologies Acquisition”) of all of the outstanding capital stock of CSP Technologies S.à r.l. (“CSP Technologies”). CSP Technologies is a leader in active packaging technology based on proprietary material science expertise for the pharma and food service markets. CSP Technologies operates manufacturing locations in the U.S. and France. The preliminary purchase price was approximately \$553.5 million and was funded by cash on hand. As of December 31, 2018, \$5 million was held in restricted cash pending the finalization of a working capital adjustment. The \$5 million cash amount was released from restriction in January 2019 after the finalization of the working capital adjustment, resulting in a refund of \$1.0 million.

CSP Technologies contributed net sales of \$48.9 million and pretax loss of \$10.2 million for the year ended December 31, 2018. Sales of \$33.9 million and \$15.0 million were reported in the Pharma and Food + Beverage segments, respectively, for the year ended December 31, 2018. Pretax loss of \$10.3 million and pretax income of \$0.1 million were reported in the Pharma and Food + Beverage segments, respectively, for the year ended December 31, 2018. Included in pretax income is \$14.1 million of fair value adjustment amortization for inventory sold during 2018. The aforementioned purchase accounting adjustments and amounts included in the following tables are provisional, as we are in the process of finalizing purchase accounting.

For the year ended December 31, 2018, we recognized \$9.0 million in transaction costs related to the acquisition of CSP Technologies. These costs are reflected in the selling, research & development and administration section of the Consolidated Statements of Income and within acquisition-related costs as disclosed in Note 18 – Segment Information.

On February 29, 2016, we completed our acquisition of MegaPlast GmbH and its subsidiaries along with Megaplast France S.a.r.l and Mega Pumps L.P. (“Mega Airless”). Mega Airless is a leading provider of innovative all-plastic airless dispensing systems for the beauty, personal care and pharmaceutical markets and operates two manufacturing facilities in Germany and one in the United States. The purchase price paid for Mega Airless was approximately \$223.2 million (\$203.0 million net of cash received) and was funded by cash on hand and borrowings on our revolving line of credit.

Mega Airless contributed net sales of \$59.4 million and pretax income of \$4.1 million for the year ended December 31, 2016. Included in pretax income is a purchase accounting adjustment of \$2.6 million related to the fair value of inventory acquired. The results of the acquired business from the acquisition date are included in the accompanying consolidated financial statements and are reported in the Beauty + Home and Pharma reporting segments.

For the year ended December 31, 2016, we recognized \$5.6 million in transaction costs related to the acquisition of Mega Airless. These costs are reflected in the selling, research & development and administration section of the Consolidated Statements of Income.

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The following table summarizes the assets acquired and liabilities assumed as of the acquisition date at estimated fair value.

	Mega Airless February 29, 2016	CSP Technologies August 27, 2018
Assets		
Cash and equivalents	\$ 20,197	\$ 24,053
Accounts receivable	8,275	20,847
Inventories	8,373	42,169
Prepaid and other	378	3,995
Property, plant and equipment	47,768	99,194
Goodwill	105,561	278,020
Intangible assets	72,106	177,120
Other miscellaneous assets	8	1,039
Liabilities		
Current maturities of long-term obligations	319	129
Accounts payable and accrued liabilities	7,398	31,989
Long-term obligations	13,402	6,037
Deferred income taxes	18,366	38,442
Retirement and deferred compensation plans	—	1,038
Deferred and other non-current liabilities	—	15,344
Net assets acquired	\$ 223,181	\$ 553,458

The following table is a summary of the fair value estimates of the acquired identifiable intangible assets and weighted-average useful lives as of the acquisition date:

	Mega Airless Weighted-Average Useful Life (in years)	Estimated Fair Value of Asset	CSP Technologies Weighted-Average Useful Life (in years)	Estimated Fair Value of Asset
Acquired technology	15	\$ 10,838	12	\$ 46,700
Customer relationships	11	57,120	16	113,300
Trademarks and trade names	4	4,148	9	14,600
License agreements and other			11	2,520
Total		\$ 72,106		\$ 177,120

Goodwill in the amount of \$278.0 million was recorded for the CSP Technologies acquisition, of which \$174.3 million and \$103.7 million is included in the Pharma and Food + Beverage segments, respectively. Goodwill in the amount of \$105.6 million was recorded for the acquisition of Mega Airless, of which \$49.8 million and \$55.8 million is included in the Beauty + Home and Pharma segments, respectively. Goodwill is calculated as the excess of the

consideration transferred over the net assets acquired and represents the estimated future economic benefits arising from other assets acquired that could not be individually identified and separately recognized. Goodwill largely consists of leveraging our commercial presence in selling the CSP Technologies and Mega Airless lines of products in markets where CSP Technologies and Mega Airless did not previously operate and the abilities of CSP Technologies and Mega Airless to maintain their competitive advantage from a technical viewpoint. Goodwill will not be amortized, but will be tested for impairment at least annually. We do not expect any of the goodwill will be deductible for tax purposes.

The unaudited pro forma results presented below include the effects of the CSP Technologies acquisition as if it had occurred as of January 1, 2017. The unaudited pro forma results reflect certain adjustments related to the acquisition, such as intangible asset amortization, fair value adjustments for inventory and financing costs related to the change in our debt structure. The 2018 pro forma earnings were adjusted to exclude \$16.7 million after tax (\$22.0 million pretax) of transaction and other costs. The aforementioned costs include compensation, consulting, legal and advisory fees. The 2018 pro forma earnings were also adjusted to exclude \$10.9 million after tax (\$14.1 million pretax) of nonrecurring expense related to the fair value adjustment to acquisition-date inventory. The 2017 pro forma earnings were adjusted to include these adjustments.

The unaudited pro forma results presented below include the effects of the Mega Airless acquisition as if it had occurred as of January 1, 2015. The unaudited pro forma results reflect certain adjustments related to the acquisition, such as the amortization associated with estimates for the acquired intangible assets and fair value adjustments for inventory. The 2016 pro forma earnings were adjusted to exclude \$4.2 million after tax (\$5.6 million pretax) of transaction costs, including consulting, legal, and advisory fees. The 2016 pro forma earnings were also adjusted to exclude \$1.7 million after tax (\$2.6 million pretax) of nonrecurring expense related to the fair value adjustment to acquisition-date inventory.

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The pro forma results do not include any synergies or other expected benefits of the acquisition. Accordingly, the unaudited pro forma financial information below is not necessarily indicative of either future results of operations or results that might have been achieved had the acquisition been completed on the dates indicated.

Years Ended December 31,	2018	2017	2016
Net Sales	\$ 2,857,765	\$ 2,605,095	\$ 2,340,000
Net Income Attributable to AptarGroup Inc.	208,717	230,753	213,000
Net Income per common share — basic	3.34	3.70	3.39
Net Income per common share — diluted	3.21	3.57	3.29

On May 1, 2018, we acquired 100% of the common stock of Reboul, a French manufacturer specializing in stamping, decorating and assembling metal and plastic packaging for the cosmetics and luxury markets, for an initial purchase price of approximately \$3.6 million (exclusive of \$112 thousand of cash acquired) (the “Reboul Acquisition”). The results of Reboul’s operations have been included in the consolidated financial statements within our Beauty + Home segment since the date of acquisition. As part of the Reboul Acquisition, we were obligated to pay to the selling shareholders of Reboul certain contingent consideration based on 2018 EBITDA as defined in the purchase agreement. These targets were not achieved and we did not pay any contingent consideration.

In May 2018, we invested \$10.0 million in preferred equity stock of Reciprocal Labs Corporation, doing business as Propeller Health, consistent with measurement alternative guidance described in Note 1 above. No impairment charge was recorded during 2018 against this investment. We recorded a gain of approximately \$6.5 million during the fourth quarter of 2018 by adjusting the carrying amount to its expected sales proceeds as this investment was ultimately sold during January 2019.

In February 2017, we acquired a 20% minority interest in Kali Care, Inc. (“Kali Care”) for \$5.0 million. Kali Care is a Silicon Valley-based technology company, which provides digital monitoring systems for ophthalmic medication. Kali Care’s sensing technology allows clinicians to collect real time compliance data and is a powerful tool for ophthalmologists in managing the care of their patients and represents an additional investment into connected devices for our Pharma applications. This investment is being accounted for under the equity method of accounting from the date of acquisition. There were no indications of impairment for the twelve months ended December 31, 2018.

NOTE 21 RESTRUCTURING INITIATIVES

In late 2017, Aptar began a business transformation to drive profitable sales growth, increase operational excellence, enhance our approach to innovation and improve organizational effectiveness. The primary focus of the plan will be the Beauty + Home segment; however, certain global general and administrative functions will also be addressed. During 2018 and 2017, we recognized approximately \$63.8 and \$2.2 million of restructuring costs related to this plan, respectively. Using current exchange rates, we estimate total implementation costs of approximately \$90 million over three years. We also anticipate making capital investments related to the transformation plan of approximately \$55 million, of which the majority will be in 2019.

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As of December 31, 2018 we have recorded the following activity associated with the transformation plan:

	Beginning Reserve at	Net Charges for the Year Ended	Cash Paid	FX Impact	Ending Reserve at
	12/31/2017	12/31/2018			12/31/2018
Employee severance	\$ 2,258	\$ 5,107	\$ (3,361)	\$ (70)	\$ 3,934
Professional fees and other costs	—	58,722	(47,617)	(4)	11,101
Totals	\$ 2,258	\$ 63,829	\$ (50,978)	\$ (74)	\$ 15,035

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NOTE 22 QUARTERLY DATA (UNAUDITED)

Quarterly results of operations and per share information for the years ended December 31, 2018 and 2017 are as follows:

Quarter First	Total
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