2018 ANNUAL REPORT

PENTAIR

Move. Improve. Enjoy.
FOR LIFE.



PENTAIR SOLUTIONS THROUGHOUT **YOUR DAY**

Pentair helps people around the world move, improve and enjoy their water.

Smart, Sustainable Water Solutions. **FOR LIFE.**



7:00 AM

While at a hotel, be comforted by **Pentair's fire protection systems** and enjoy a hot shower with steady water pressure due to **Pentair's constant pressure booster systems.**



8:00 AM

Stop at the health club to take a few laps in the swimming pool with water that has been filtered and sanitized with **Pentair's commercial pool solutions.**



10:00 AM

Gather with friends or colleagues at the neighborhood coffee shop to enjoy a freshly brewed cup of coffee made with **water delivered and filtered by Pentair technology.**



12:00 PM

Make a healthy lunch with food grown more sustainably with the help of **Pentair's irrigation and precision agriculture solutions.**



2:00 PM

Stay hydrated throughout the day at home and at work with great-tasting water thanks to **Pentair's treatment and filtration technologies.**



4:00 PM

Relax and enjoy your pool time with **Pentair's energy efficient pool pumps and innovative heating solutions.**



5:00 PM

Meet up with friends for happy hour at a local microbrewery that utilizes **Pentair's filtration and sustainable brewing solutions.**



6:00 PM

Despite heavy rains outside, **Pentair's residential pumps** work to keep your home dry.



7:00 PM

Clean up after a fun day of play with conditioned water delivered efficiently and consistently thanks to **Pentair's submersible well pumps and treatment systems.**

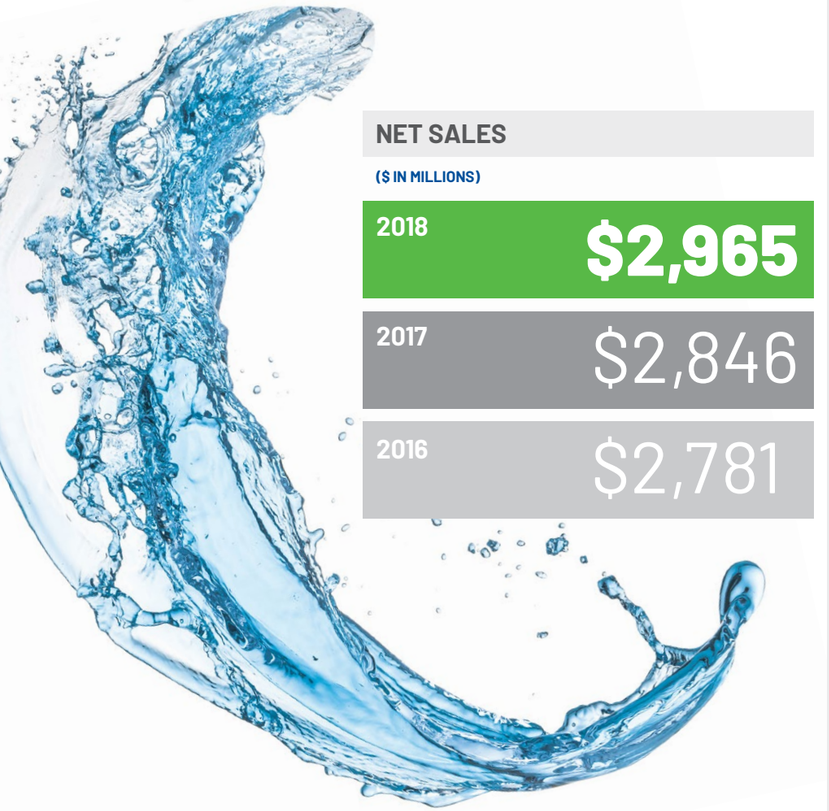


8:00 PM

Relax and enjoy an evening of family fun while easily managing pool features with **Pentair's smart technology and connected apps.**

2018 FINANCIAL HIGHLIGHTS

- Delivered sales of $2.97 billion, with sales growth of 4 percent.
- Segment income growth of 8 percent to $537 million.[1]
- Generated free cash flow of $410 million, representing 98 percent of adjusted net income.
- Returned nearly $700 million of cash to shareholders through buybacks and dividends. 2018 marked the 42nd consecutive year in which Pentair increased its dividend.



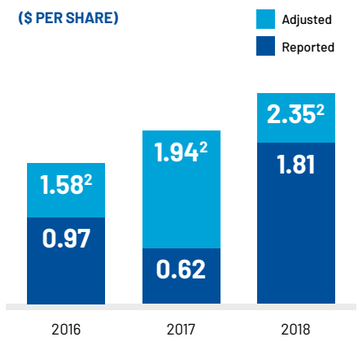
NET SALES

($ IN MILLIONS)

2018	$2,965
2017	$2,846
2016	$2,781

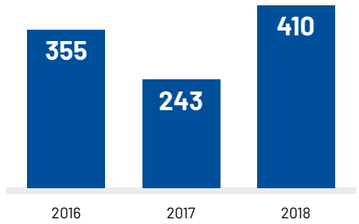
DILUTED EPS

($ PER SHARE)



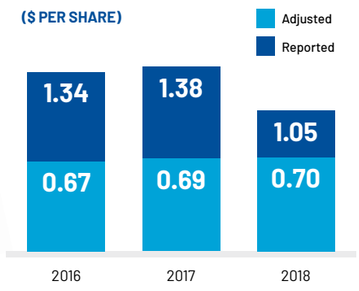
FREE CASH FLOW

($ IN MILLIONS)



ANNUAL DIVIDENDS

($ PER SHARE)



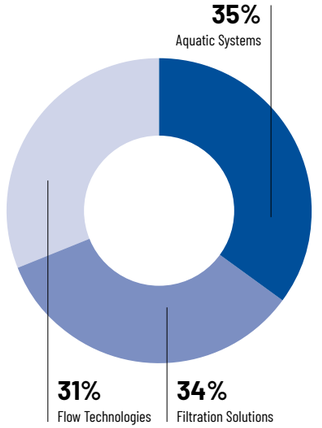
1. 2018 segment income includes equity income of unconsolidated subsidiaries of approximately $8 million and excludes intangible amortization of approximately $35 million, restructuring and other costs of approximately $32 million, trade name and other impairment of approximately $12 million, corporate allocations of approximately $11 million, and deal related costs and expenses of approximately $2 million. 2017 segment income includes equity income of unconsolidated subsidiaries of approximately $1 million and excludes intangible amortization of approximately $36 million, restructuring and other costs of approximately $28 million, trade name and other impairment of approximately $16 million, and corporate allocations of approximately $37 million.

2. 2018 adjusted EPS excludes intangible amortization of $0.16, restructuring and other costs of $0.14, trade name and other impairment of $0.06, deal related costs and expenses of $0.01, loss of early extinguishment of debt of $0.08, corporate allocation and interest expense adjustments of $0.09, a pension "mark to market" loss of $0.02, and loss on sale of businesses and tax adjustments of ($0.02); 2017 adjusted EPS excludes intangible amortization of $0.16, restructuring and other costs of $0.12, trade name and other impairment of $0.07, loss of early extinguishment of debt of $0.44, corporate allocation and interest expense adjustments of $0.34, a pension "mark to market" loss of $0.04, and loss on sale of businesses and tax adjustments of $0.15; 2016 adjusted EPS excludes intangible amortization of $0.16, restructuring and other costs of $0.03, corporate allocation and interest expense adjustments of $0.46, a pension "mark to market" gain of ($0.06), and loss of sale of businesses of $0.02.

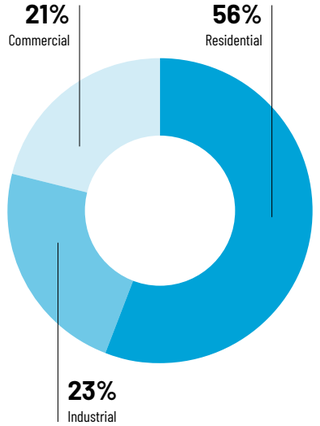
2018 FINANCIAL PERFORMANCE

Pentair reports the performance of its business in three segments that focus on three primary verticals in four broad geographic regions.

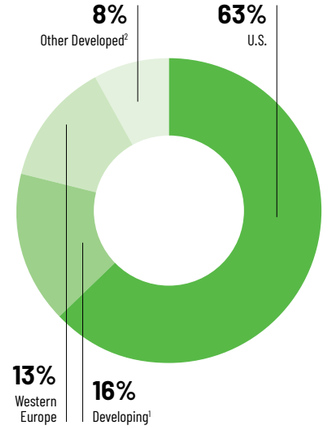
2018 SALES **BY SEGMENT**



2018 SALES **BY VERTICAL**



2018 SALES **BY REGION**



2018 **SEGMENT SALES**

Aquatic Systems

Manufactures and sells a complete line of energy-efficient residential and commercial pool equipment and accessories. Applications include pool maintenance, pool repair, renovation, service and construction and aquaculture solutions.

2018 AQUATIC SYSTEMS SALES **BY VERTICAL** ($ IN MILLIONS)



86% Residential	$ 878.7
14% Commercial	$ 147.4
0% Industrial	$ 0.0
100% TOTAL	$ 1,026.1

2018 AQUATIC SYSTEMS SALES **BY REGION** ($ IN MILLIONS)



85% U.S.	$ 875.6
7% Developing[1]	$ 70.3
5% Other Developed[2]	$ 46.1
3% Western Europe	$ 34.1
100% TOTAL	$ 1,026.1

Filtration Solutions

Manufactures and sells water and fluid treatment products and systems for global residential, industrial and commercial markets. Applications include fluid filtration, ion exchange, desalination, food and beverage, food service and separation technologies for the oil and gas industry.

2018 FILTRATION SOLUTIONS SALES **BY VERTICAL** ($ IN MILLIONS)



44% Industrial	$ 438.2
29% Residential	$ 287.8
27% Commercial	$ 275.0
100% TOTAL	$ 1,001.0

2018 FILTRATION SOLUTIONS SALES **BY REGION** ($ IN MILLIONS)



43% U.S.	$ 429.9
28% Developing[1]	$ 275.7
21% Western Europe	$ 215.1
8% Other Developed[2]	$ 80.3
100% TOTAL	$ 1,001.0

Flow Technologies

Manufactures and sells pumps used in applications including residential and municipal wells, water treatment, wastewater solids handling, pressure boosting, fluid delivery, circulation and transfer, fire suppression, flood control, agricultural irrigation and crop spray.

2018 FLOW TECHNOLOGIES SALES **BY VERTICAL** ($ IN MILLIONS)



53% Residential	$ 499.3
25% Industrial	$ 229.2
22% Commercial	$ 208.2
100% TOTAL	$ 936.7

2018 FLOW TECHNOLOGIES SALES **BY REGION** ($ IN MILLIONS)



59% U.S.	$ 552.5
16% Western Europe	$ 153.5
14% Developing[1]	$ 130.6
11% Other Developed[2]	$ 100.1
100% TOTAL	$ 936.7

1. Includes China, Eastern Europe, Latin America, The Middle East, Southeast Asia
2. Includes Australia, Canada, Japan

DEAR **FELLOW SHAREHOLDER,**



Looking back at 2018, we are proud of the progress we made as we began our journey as the "new Pentair." On April 30, 2018, we transferred our electrical business to nVent Electric plc and spun off nVent as a public company to shareholders, retaining our water business as a residential and commercial water treatment company. As a pure play water company, we offer a comprehensive range of smart, sustainable water solutions to homes, businesses and industries around the world. Our industry leading and proven portfolio of solutions enables our customers to access clean, safe water. Whether it's moving, improving, or enjoying water, we help manage the world's most precious resource.

2018: A Successful First Year

As the "new Pentair," we developed a detailed and executable residential and commercial water treatment strategy. Consumers today are increasingly concerned about water quality. Homeowners want to be empowered to improve the health of their water inside their homes and commercial customers want quality, consistency and efficiency. Our solutions offer not only great tasting water, but peace of mind for those concerned about the health and taste of their water.

Our Positive Impact:
Pentair's residential filtration solutions eliminated the need for over 9 billion water bottles.

Delivering smart, sustainable solutions is articulated in our new purpose, mission and vision, brought to life through our approximately 10,000 employees and showcased on our website. The new website is part of our digital transformation in creating the online experience our customers are expecting as we transition from a business-to-business industrial company to an omni-channel water treatment organization.

Delivering on Our Commitments

In our first year, we delivered on our financial 2018 commitments despite the impact of tariffs and inflation. In addition to solid financial performance, we returned nearly $700 million to shareholders through buybacks and dividends. Our cash generation remained strong and our balance sheet continued to be in great shape.

Our **Aquatic Systems** business, with a broad product offering and leading technology for both residential and commercial customers, exceeded $1 billion in sales in 2018. Our 2018 sales were up 9 percent, driven by our technology leadership, dealer intimacy and our aftermarket support. Advancing growth in our pool business continues to be a cornerstone of our strategy.

Filtration Solutions, which has strong, respected brands and leading technology, delivered approximately $1 billion in sales in 2018. The segment's sales were up 1 percent driven by strong distribution capabilities and technical support. We offer complete product solutions for under-sink and over-sink filtration, as well as whole house water treatment systems.

Flow Technologies, with 2018 sales up 3 percent, provides complete pump solutions through broad product offerings, with deep product application expertise in both residential and commercial as well as in the agriculture industry.

Imagining Water's Future: Pentair is Well Positioned for 2019 and Beyond

We've established technology innovation centers, where we are not only looking at new technologies, but also new applications to apply those technologies. We see tremendous opportunity to build IoT-enabled whole home and point-of-use solutions. For example, our residential pool business recently launched the Pentair IntelliCenter Control Center for pool and spa which allows pool owners to conveniently and easily monitor and control their pool's functions via a user-friendly app from anywhere in the world — or right at home.

From a strategic perspective, this is important when you look at the footprint of all our products within the residential space. Nearly everything that has to do with water in your home, we touch. Whether it is water treatment for the whole home, water filtration under your sink, the enjoyment of water in your pool, water supply and disposal, leak detection or flood control for your basement, Pentair has solutions. We have an exciting road map for developing products with smart, connected technology to create differentiated innovation aligned with our strategy.

Also, we recently completed two acquisitions, Pelican Water Systems and Aquion, which further advances our strategy by adding new and complementary products to the Pentair portfolio, and expanding our scope to better meet consumer residential water needs. Aquion brings a national affiliated dealer network under its RainSoft brand, and Pelican brings a direct-to-consumer model through a proprietary e-commerce platform, as well as a number of innovative water treatment systems and services.

Going forward we will continue to invest in our prioritized strategies, focusing on smart, sustainable solutions that empower our customers to make the most of life's essential resource. We are energized about the future and our ability to deliver for you, our shareholder.

Thank you for your support,



John L. Stauch
Pentair President and CEO

"Our vision is to be the leading residential and commercial water treatment company built through empowered employees who deliver for our customers, creating value for shareholders."

LEADERSHIP TEAM



BOARD MEMBERS (LEFT TO RIGHT)

Michael T. Speetzen
Executive Vice President, Finance and Chief Financial Officer of Polaris Industries Inc.
DIRECTOR SINCE 2018

Theodore L. Harris
Chief Executive Officer and Director of Balchem Corporation
DIRECTOR SINCE 2018

Jacques H.G. Esculier
Chief Executive Officer, Director and Chairman, WABCO Holdings, Inc.
DIRECTOR SINCE 2014

David A. Jones
Chairman of the Board; Senior Advisor to Oak Hill Capital Partners
DIRECTOR SINCE 2003

Billie I. Williamson
Chair of Governance Committee; Former Senior Assurance Partner at Ernst & Young
DIRECTOR SINCE 2014

John L. Stauch
President and Chief Executive Officer Pentair plc
DIRECTOR SINCE 2018

Glynis A. Bryan
Chair of the Audit and Finance Committee; Chief Financial Officer of Insight Enterprises, Inc.
DIRECTOR SINCE 2003

T. Michael Glenn
Chair of the Compensation Committee; Senior Advisor to Oak Hill Capital Partners
DIRECTOR SINCE 2007

MANAGEMENT

John L. Stauch
President, Chief Executive Officer

Kelly A. Baker
Executive Vice President, Chief Human Resources Officer

Mark C. Borin
Executive Vice President, Chief Financial Officer

Karl R. Frykman
Executive Vice President, Chief Operating Officer

John H. Jacko
Executive Vice President, Chief Growth Officer

Karla C. Robertson
Executive Vice President, General Counsel, Secretary

Philip M. Rolchigo
Executive Vice President, Chief Technology Officer

ANNUAL GENERAL MEETING

Our Annual General Meeting of Shareholders will be held at Claridge's, Brook Street, Mayfair, London, United Kingdom, W1K4HR, Tuesday, May 7, 2019 at 8:00 a.m. local time. Shareholders in Ireland may participate in the Annual General Meeting of Shareholders by audio link at the offices of Arthur Cox, Ten Earlsfort Terrace, Dublin 2, D02 T380, Ireland, at 8:00 a.m. local time.

INVESTOR INFORMATION

Shareholders seeking more information about the Company can access news releases describing significant company events and earnings results for each quarter and the fiscal year as well as Form 10-K and other Securities and Exchange Commission filings at www.pentair.com.

Information may also be obtained by request from the Pentair Investor Relations Department, 5500 Wayzata Boulevard, Suite 900, Minneapolis, Minnesota 55416

STOCK EXCHANGE LISTING

New York Stock Exchange (symbol: PNR)

REGISTRAR, STOCK TRANSFER AND PAYING AGENT

Computershare, Inc.
P.O. Box 505000
Louisville, KY 40233-5000
Telephone inquiries: 1-866-241-7684 (U.S.)
1-732-491-0587 (non U.S.)
E-mail inquiries: web.queries@computershare.com

Smart, Sustainable Water Solutions. **FOR LIFE.**

CAUTION CONCERNING FORWARD-LOOKING STATEMENTS

This communication contains statements that we believe to be "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. All statements, other than statements of historical fact are forward-looking statements. Without limitation, any statements preceded or followed by or that include the words "targets," "plans," "believes," "expects," "intends," "will," "likely," "may," "anticipates," "estimates," "projects," "should," "would," "positioned," "strategy," "future" or words, phrases or terms of similar substance or the negative thereof, are forward-looking statements. These forward-looking statements are not guarantees of future performance and are subject to risks, uncertainties, assumptions and other factors, some of which are beyond our control, which could cause actual results to differ materially from those expressed or implied by such forward-looking statements. These factors include overall global economic and business conditions impacting our business, including the strength of housing and related markets; competition and pricing pressures in the markets we serve; volatility in currency exchange rates; failure of markets to accept new product introductions and enhancements; the ability to successfully identify, finance, complete and integrate acquisitions, including the Aquion, Inc. and Pelican Water Systems acquisitions; the ability to achieve the benefits of our restructuring plans and cost reduction initiatives; risks associated with operating foreign businesses; the impact of material cost and other inflation; our ability to comply with laws and regulations; the impact of changes in laws, regulations and administrative policy, including those that limit U.S. tax benefits or impact trade agreements and tariffs; the outcome of litigation and governmental proceedings; the ability to realize the anticipated benefits from the separation of our Electrical business from the rest of Pentair; and the ability to achieve our long-term strategic operating goals. Additional information concerning these and other factors is contained in our filings with the U.S. Securities and Exchange Commission, including in our Annual Report on Form 10-K for the year ended December 31, 2018. All forward-looking statements speak only as of the date of this communication. Pentair assumes no obligation, and disclaims any obligation, to update the information contained in this communication.

PENTAIR

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**

Commission file number 001-11625

Pentair plc

(Exact name of Registrant as specified in its charter)

Ireland	**98-1141328**
(State or other jurisdiction of incorporation or organization)	***(I.R.S. Employer Identification number)***

Regal House, 70 London Road, Twickenham, London, TW13QS United Kingdom

(Address of principal executive offices)

Registrant's telephone number, including area code: 44-74-9421-6154

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

Title of each class	**Name of each exchange on which registered**
Ordinary Shares, nominal value $0.01 per share	New York Stock Exchange

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

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

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

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T 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. Yes ☐ No ☑

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

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

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 ☑

Aggregate market value of voting and non-voting common equity held by non-affiliates of the Registrant, based on the closing price of $42.08 per share as reported on the New York Stock Exchange on June 29, 2018 (the last business day of Registrant's most recently completed second quarter): $6,703,824,353 .

The number of shares outstanding of Registrant's only class of common stock on December 31, 2018 was 171,363,615 .

DOCUMENTS INCORPORATED BY REFERENCE

Parts of the Registrant's definitive proxy statement for its annual general meeting to be held on May 7, 2019 , are incorporated by reference in this Form 10-K in response to Part III, ITEM 10, 11, 12, 13 and 14.

Pentair plc

Annual Report on Form 10-K
For the Year Ended December 31, 2018

		Page
	PART I	
ITEM 1.	Business	1
ITEM 1A.	Risk Factors	4
ITEM 1B.	Unresolved Staff Comments	14
ITEM 2.	Properties	14
ITEM 3.	Legal Proceedings	14
ITEM 4.	Mine Safety Disclosures	15
	PART II	
ITEM 5.	Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities	17
ITEM 6.	Selected Financial Data	19
ITEM 7.	Management's Discussion and Analysis of Financial Condition and Results of Operations	20
ITEM 7A.	Quantitative and Qualitative Disclosures about Market Risk	36
ITEM 8.	Financial Statements and Supplementary Data	38
ITEM 9.	Changes in and Disagreements with Accountants on Accounting and Financial Disclosure	86
ITEM 9A.	Controls and Procedures	86
ITEM 9B.	Other Information	86
	PART III	
ITEM 10.	Directors, Executive Officers and Corporate Governance	87
ITEM 11.	Executive Compensation	87
ITEM 12.	Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters	88
ITEM 13.	Certain Relationships and Related Transactions and Director Independence	88
ITEM 14.	Principal Accounting Fees and Services	88
	PART IV	
ITEM 15.	Exhibits and Financial Statement Schedules	89
ITEM 16.	Form 10-K Summary	89
	Signatures	94

PART I

ITEM 1. BUSINESS

GENERAL
At Pentair plc, we believe the health of our world depends on reliable access to clean water. We deliver a comprehensive range of smart, sustainable water solutions to homes, business and industry around the world. Our industry leading and proven portfolio of solutions enables our customers to access clean, safe water. Whether it's improving, moving or enjoying water, we help manage the world's most precious resource. Smart, Sustainable Water Solutions. For Life.

Pentair plc is comprised of three reportable business segments: Aquatic Systems, Filtration Solutions and Flow Technologies. See below for further discussion of each of these segments.

Pentair strategy
Our vision is to be the leading residential and commercial water treatment company. As a pure play water company, we are:

- Focused on strategies to advance pool growth and accelerate residential and commercial water treatment;
- Accelerated by innovation and digital transformation; and
- Grounded in Win Right values and utilizing the Pentair Integrated Management System ("PIMS") consisting of lean enterprise, growth and talent management to drive sustained and consistent performance.

Unless the context otherwise indicates, references herein to "Pentair," the "Company," and such words as "we," "us," and "our" include Pentair plc and its consolidated subsidiaries. We are an Irish public limited company that was formed in 2014. We are the successor to Pentair Ltd., a Swiss corporation formed in 2012, and Pentair, Inc., a Minnesota corporation formed in 1966 and our wholly-owned subsidiary, under the Securities Exchange Act of 1934, as amended (the "Exchange Act"). Although our jurisdiction of organization is Ireland, we manage our affairs so that we are centrally managed and controlled in the United Kingdom (the "U.K.") and therefore have our tax residency in the U.K.

HISTORY AND DEVELOPMENT
On April 28, 2017, we completed the sale of the Valves & Controls business to Emerson Electric Co. for $3.15 billion in cash. The sale resulted in a gain of $181.1 million , net of tax. The results of the Valves & Controls business have been presented as discontinued operations. The Valves & Controls business was previously disclosed as a stand-alone reporting segment.

On April 30, 2018, Pentair completed the separation of its Electrical business from the rest of Pentair (the "Separation") by means of a dividend in specie of the Electrical business, which was effected by the transfer of the Electrical business from Pentair to nVent Electric plc ("nVent") and the issuance by nVent of ordinary shares directly to Pentair shareholders (the "Distribution"). On May 1, 2018, following the Separation and Distribution, nVent became an independent publicly traded company, trading on the New York Stock Exchange under the symbol "NVT." The Company did not retain any equity interest in nVent. nVent's historical financial results are reflected in the Company's consolidated financial statements as a discontinued operation. Refer to Note 2 for further discussion.

In connection with the Distribution of nVent, the Company and nVent entered into several agreements covering administrative and tax matters to provide or obtain services on a transitional basis, as needed, for varying periods after the Distribution. The administrative agreements cover various services such as information technology, human resources and finance. The Company expects all services to be substantially complete within one year after the Distribution.

Our registered principal office is located at Regal House, 70 London Road, Twickenham, London, TW13QS United Kingdom. Our management office in the United States ("U.S.") is located at 5500 Wayzata Boulevard, Suite 900, Minneapolis, Minnesota.

BUSINESS AND PRODUCTS
The following is a brief description of each of the Company's reportable segments and business activities.

Aquatic Systems
The Aquatic Systems segment manufactures and sells a complete line of energy-efficient residential and commercial pool equipment and accessories including pumps, filters, heaters, lights, automatic controls, automatic cleaners, maintenance equipment and pool accessories. Applications for our Aquatic Systems products include residential and commercial pool maintenance, pool repair, renovation, service and construction and aquaculture solutions.

Brand names for Aquatic Systems include Kreepy Krauly, Pentair, Pentair Aquatic Eco-Systems, and Sta-Rite.

Customers
Aquatic Systems customers include businesses engaged in wholesale and retail distribution in the residential & commercial verticals. Customers in the residential & commercial verticals also include end-users and consumers. Pentair's verticals include residential, commercial, and industrial businesses.

One customer of the Aquatic Systems segment, Pool Corporation, represented approximately 15% of our consolidated net sales in 2018 .

Seasonality
We experience seasonal demand with several end customers and end-users within Aquatic Systems. End-user demand for pool equipment follows warm weather trends and is at season highs from April to August. The magnitude of the sales increase is mitigated by employing some advance sale "early buy" programs (generally including extended payment terms and/or additional discounts).

Competition
Aquatic Systems faces numerous domestic and international competitors, some of which have substantially greater resources directed to the verticals in which we compete. Competition focuses on brand names, product performance (including energy-efficient offerings and required specifications), quality, service and price. We compete by offering a wide variety of innovative and high-quality products, which are competitively priced. We believe our distribution channels and reputation for quality also provide us a competitive advantage.

Filtration Solutions
The Filtration Solutions segment designs, manufactures, markets and services innovative water solutions to meet filtration and separation challenges across residential, commercial, food & beverage and industrial applications.

Filtration Solutions offers a comprehensive product suite of components and systems that ranges from point-of-entry and point-of-use filtration, valves and automated controls for residential and commercial applications as well as advanced filtration, oil & gas separation, membrane technology, and energy recovery for food & beverage and industrial applications. Our equipment and solutions are found in water purification and sanitation systems, foodservice operations, food & beverage processing plants and in other applications across the globe.

The portfolio of products serves a range of industries, including use in the commercial, residential and industrial verticals. Brand names for Filtration Solutions offerings include Codeline, Everpure, Haffmans, Südmo and X-Flow.

Customers
Filtration Solutions customers include businesses engaged in wholesale and retail distribution in the residential, commercial, food & beverage and industrial verticals. Customers in the residential and commercial vertical also include end-users, consumers and original equipment manufacturers.

Seasonality
We experience seasonal demand with several end customers and end-users within Filtration Solutions. End-user demand for water filtration products generally follows warm weather trends and is at seasonal highs from April to July.

Competition
Filtration Solutions faces numerous domestic and international competitors, some of which have substantially greater resources directed to the verticals in which we compete. Competition focuses on brand names, product performance (including required specification), quality and price. We compete by offering a wide variety of innovative and high-quality products, which are competitively priced. We believe our distribution channels and reputation for quality also provide us a competitive advantage.

Flow Technologies
The Flow Technologies segment manufactures and sells products ranging from light duty diaphragm pumps to high-flow turbine pumps and solid handling pumps while serving the global residential, commercial and industrial markets. These pumps are used in a range of applications, including residential and municipal wells, water treatment, wastewater solids handling, pressure boosting, fluid delivery, circulation and transfer, fire suppression, flood control, agricultural irrigation and crop spray.

Brand names for Flow Technologies include Aurora, Berkeley, Fairbanks-Nijhuis, Hydromatic, Hypro, Jung Pumpen, Pentair, Myers, Sta-Rite, and Shurflo.

Customers
Flow Technologies customers include businesses engaged in wholesale and retail distribution in the residential & commercial, food & beverage and industrial verticals. Customers also include end-users and consumers in the residential & commercial vertical.

Seasonality
We experience increased demand for residential water supply, infrastructure and agricultural products following warm weather trends, which are at season highs from April to August. The magnitude of the sales increase is mitigated by employing some advance sale "early buy" programs (generally including extended payment terms and/or additional discounts). Seasonal effects may vary from year to year and are impacted by weather patterns, particularly by temperatures, heavy flooding and droughts.

Competition
Flow Technologies faces numerous domestic and international competitors, some of which have substantially greater resources directed to the verticals in which we compete. Competition focuses on brand names, product performance (including energy-efficient offerings and required specifications), quality, service and price. We compete by offering a wide variety of innovative and high-quality products, which are competitively priced.

INFORMATION REGARDING ALL REPORTABLE SEGMENTS

Backlog of orders by segment

	December 31			
In millions	**2018**	**2017**	**$ change**	**% change**
Aquatic Systems	$ 80.3	$ 110.1	$ (29.8)	(27.1)%
Filtration Solutions	96.2	145.7	(49.5)	(34.0)%
Flow Technologies	156.0	151.1	4.9	3.2 %
Total	$ 332.5	$ 406.9	$ (74.4)	(18.3)%

A substantial portion of our revenues result from orders received and products delivered in the same month. Our backlog typically has a short manufacturing cycle and products generally ship within 90 days of the date on which a customer places an order. However, a portion of our backlog, particularly from orders for major capital projects, can take more than one year depending on the size and type of order. We record as part of our backlog all orders from external customers, which represent firm commitments, and are supported by a purchase order or other legitimate contract. We expect the majority of our backlog at December 31, 2018 will be shipped in 2019 .

Research and development
We conduct research and development activities primarily in our own facilities. These efforts consist primarily of the development of new products, product applications and manufacturing processes.

Raw materials
The principal materials we use in manufacturing our products are electric motors, mild steel, stainless steel, electronic components, plastics (resins, fiberglass, epoxies), copper and paint (powder and liquid). In addition to the purchase of raw materials, we purchase some finished goods for distribution through our sales channels.

We purchase the materials we use in various manufacturing processes on the open market and the majority is available through multiple sources which are in adequate supply. We have not experienced any significant work stoppages to date due to shortages of materials. We have certain long-term commitments, principally price commitments, for the purchase of various component parts and raw materials and believe that it is unlikely that any of these agreements would be terminated prematurely. Alternate sources of supply at competitive prices are available for most materials for which long-term commitments exist and we believe that the termination of any of these commitments would not have a material adverse effect on our financial position, results of operations or cash flows.

Certain commodities, such as metals and resin, are subject to market and duty-driven price fluctuations. We manage these fluctuations through several mechanisms, including long-term agreements with price adjustment clauses for significant commodity market movements in certain circumstances. Prices for raw materials, such as metals and resins, may trend higher in the future.

Intellectual property
Patents, non-compete agreements, proprietary technologies, customer relationships, trademarks, trade names and brand names are important to our business. However, we do not regard our business as being materially dependent upon any single patent, non-compete agreement, proprietary technology, customer relationship, trademark, trade name or brand name.

Patents, patent applications and license agreements will expire or terminate over time by operation of law, in accordance with their terms or otherwise. We do not expect the termination of patents, patent applications or license agreements to have a material adverse effect on our financial position, results of operations or cash flows.

Employees
As of December 31, 2018 , we employed approximately 10,000 people worldwide.

Captive insurance subsidiary
We insure certain general and product liability, property, workers' compensation and automobile liability risks through our regulated wholly-owned captive insurance subsidiary, Penwald Insurance Company ("Penwald"). Reserves for policy claims are established based on actuarial projections of ultimate losses. Accruals with respect to liabilities insured by third parties, such as liabilities arising from acquired businesses, pre-Penwald liabilities and those of certain non-U.S. operations are established.

Matters pertaining to Penwald are discussed in ITEM 3 and ITEM 8, Note 1 of the Notes to Consolidated Financial Statements – Insurance subsidiary, included in this Form 10-K.

Available information
We make available free of charge (other than an investor's own Internet access charges) through our Internet website (http://www.pentair.com) our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and if applicable, amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act as soon as reasonably practicable after we electronically file such material with, or furnish it to, the Securities and Exchange Commission (the "SEC"). Reports of beneficial ownership filed by our directors and executive officers pursuant to Section 16(a) of the Exchange Act are also available on our website. We are not including the information contained on our website as part of or incorporating it by reference into, this Annual Report on Form 10-K.

ITEM 1A. RISK FACTORS

You should carefully consider all of the information in this document and the following risk factors before making an investment decision regarding our securities. Any of the following risks could materially and adversely affect our business, financial condition, results of operations, cash flows and the actual outcome of matters as to which forward-looking statements are made in this document.

Risks Relating to Our Business

General global economic and business conditions affect demand for our products.
We compete in various geographic regions and product markets around the world. Among these, the most significant are global industrial, commercial, and residential markets. We have experienced, and expect to continue to experience, fluctuations in revenues and results of operations due to economic and business cycles. Important factors for our businesses and the businesses of our customers include the overall strength of the economy and our customers' confidence in the economy, industrial and governmental capital spending, the strength of the residential and commercial real estate markets, the residential housing market, the commercial business climate, unemployment rates, availability of consumer and commercial financing, interest rates, and energy and commodity prices. The businesses of many of our industrial customers are to varying degrees cyclical and have experienced periodic downturns. While we attempt to minimize our exposure to economic or market fluctuations by serving a balanced mix of end markets and geographic regions, any of the above factors, individually or in the aggregate, or a significant or sustained downturn in a specific end market or geographic region could reduce demand for our products and services, which could have a material adverse effect on our business, financial condition, results of operations and cash flows.

We compete in attractive markets with a high level of competition, which may result in pressure on our profit margins and limit our ability to maintain or increase the market share of our products.
The markets for our products and services are geographically diverse and highly competitive. We compete against large and well-established national and global companies, as well as regional and local companies and lower cost manufacturers. We compete based on technical expertise, intellectual property, reputation for quality and reliability, timeliness of delivery, previous installation history, contractual terms, service offerings, customer experience and service, and price. Some of our competitors, in particular smaller companies, attempt to compete based primarily on price, localized expertise and local relationships, especially with respect to products and applications that do not require a great deal of engineering or technical expertise. In addition, during economic downturns average selling prices tend to decrease as market participants compete more aggressively on price. If we are unable to continue to differentiate our products, services and solutions, or if we are forced to cut prices or to incur additional costs to remain competitive, it could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Volatility in currency exchange rates could have a material adverse effect on our financial condition, results of operations and cash flows.
Sales outside of the U.S. for the year ended December 31, 2018 accounted for 37% of our net sales. Our financial statements reflect translation of items denominated in non-U.S. currencies to U.S. dollars. Therefore, if the U.S. dollar strengthens in relation to the principal non-U.S. currencies from which we derive revenue as compared to a prior period, our U.S. dollar reported revenue and income will effectively be decreased to the extent of the change in currency valuations, and vice-versa. Fluctuations in foreign currency exchange rates, most notably the strengthening of the U.S. dollar against the euro, could have a material adverse effect on our reported revenue in future periods. In addition, currency variations could have a material adverse effect on margins on sales of our products in countries outside of the U.S. and margins on sales of products that include components obtained from suppliers located outside of the U.S.

Our future growth is dependent upon our ability to continue to adapt our products, services and organization to meet the demands of local markets in both developed and emerging economies and by developing or acquiring new technologies that achieve market acceptance with acceptable margins.
We operate in global markets that are characterized by customer demand that is often global in scope but localized in delivery. We compete with thousands of smaller regional and local companies that may be positioned to offer products produced at lower cost than ours, or to capitalize on highly localized relationships and knowledge that are difficult for us to replicate. Also, in several emerging markets potential customers prefer local suppliers, in some cases because of existing relationships and in other cases because of local legal restrictions or incentives that favor local businesses. Accordingly, our future success depends upon a number of factors, including our ability to adapt our products, services, organization, workforce and sales strategies to fit localities throughout the world, particularly in high growth emerging markets; identify emerging technological and other trends in our target end-markets; and develop or acquire competitive products and services and bring them to market quickly and cost-effectively. The failure to effectively adapt our products or services could have a material adverse effect on our business, financial condition, results of operations and cash flows.

We may not be able to identify, finance and complete suitable acquisitions and investments, and any completed acquisitions and investments could be unsuccessful or consume significant resources.
Our business strategy includes acquiring businesses and making investments that complement our existing businesses. We continue to analyze and evaluate the acquisition of strategic businesses or product lines with the potential to strengthen our industry position or enhance our existing set of product and service offerings. We may not be able to identify suitable acquisition candidates, obtain financing or have sufficient cash necessary for acquisitions or successfully complete acquisitions in the future. Any acquisitions that we complete may not be successful. Acquisitions and investments may involve significant cash expenditures, debt incurrences, equity issuances, operating losses and expenses. Acquisitions involve numerous other risks, including:

- diversion of management time and attention from daily operations;
- difficulties integrating acquired businesses, technologies and personnel into our business;
- difficulties in obtaining and verifying the financial statements and other business information of acquired businesses;
- inability to obtain required regulatory approvals;
- potential loss of key employees, key contractual relationships or key customers of acquired companies or of ours;
- assumption of the liabilities and exposure to unforeseen liabilities of acquired companies, including risks relating to the U.S. Foreign Corrupt Practices Act (the “FCPA”); and
- dilution of interests of holders of our shares through the issuance of equity securities or equity-linked securities.

It may be difficult for us to integrate acquired operations, including those from our recent acquisitions of Aquion, Inc. and Pelican Water Systems, efficiently into our business operations. Any acquisitions or investments may not be successful and may ultimately result in impairment charges and have a material adverse effect on our business, financial condition, results of operations and cash flows.

We may not achieve some or all of the expected benefits of our business initiatives.
During 2018 , 2017 and 2016 , we initiated and continued execution of certain business initiatives aimed at reducing our fixed cost structure and realigning our business. As a result, we have incurred substantial expense, including restructuring charges. We may not be able to achieve the operating efficiencies to reduce costs or realize benefits that were anticipated in connection with these initiatives. If we are unable to execute these initiatives as planned, we may not realize all or any of the anticipated benefits, which could have a material adverse effect on our business, financial condition, results of operations and cash flows .

We are exposed to political, regulatory, economic, trade, and other risks that arise from operating a multinational business.
Sales outside of the U.S. for the year ended December 31, 2018 accounted for 37% of our net sales. Further, most of our businesses obtain some products, components and raw materials from non-U.S. suppliers. Accordingly, our business is subject to the political, regulatory, economic, trade, and other risks that are inherent in operating in numerous countries. These risks include:

- changes in general economic and political conditions in countries where we operate, particularly in emerging markets;
- relatively more severe economic conditions in some international markets than in the U.S.;
- the imposition of tariffs, exchange controls or other trade restrictions;
- changes in tax treaties, laws or rulings that could have a material adverse impact on our effective tax rate;
- the difficulty of enforcing agreements and collecting receivables through non-U.S. legal systems;
- the difficulty of communicating and monitoring standards and directives across our global facilities;
- trade protection measures and import or export licensing requirements and restrictions;
- the possibility of terrorist action affecting us or our operations;
- the threat of nationalization and expropriation;
- difficulty in staffing and managing widespread operations in non-U.S. labor markets;
- limitations on repatriation of earnings;
- the difficulty of protecting intellectual property in non-U.S. countries; and
- changes in and required compliance with a variety of non-U.S. laws and regulations.

In 2016, the United Kingdom voted in a referendum to exit the European Union (“Brexit”), which resulted in significant currency exchange rate fluctuations and volatility. Negotiations continue to determine the terms of Brexit. Given the lack of comparable precedent and the status of the negotiations, the implications of Brexit, or how such implications might affect our company, continue to remain unclear at this time. Brexit could, among other impacts, disrupt trade and the movement of goods, services and people between the United Kingdom and the European Union or other countries as well as create legal and global economic uncertainty.

Our success depends in part on our ability to anticipate and effectively manage these and other risks. We cannot assure that these and other factors will not have a material adverse effect on our international operations or on our business as a whole.

Changes in U.S. or foreign government administrative policy, including changes to existing trade agreements, could have a material adverse effect on us.
As a result of changes to U.S. or foreign government administrative policy, there may be changes to existing trade agreements, like the North American Free Trade Agreement (“NAFTA”) and its anticipated successor agreement, the U.S.-Mexico-Canada Agreement (“USMCA”) which is still subject to approval by the U.S., Mexico and Canada, greater restrictions on free trade generally, and significant increases in tariffs on goods imported into the U.S., particularly tariffs on products manufactured in Mexico, China, or other U.S. trading countries where we have operations or manufacture or sell products, among other possible changes. If the USMCA is ratified by all three countries, many of its provisions will not take effect until 2020. While the USMCA is somewhat similar to NAFTA, it contains several new compliance obligations addressing such issues as rules of origin, labor standard, certificate of origin documentation and de minimis thresholds, as well as new policies on labor and environmental standards, intellectual property protections and some digital trade provisions. We are currently analyzing the expected impact of the USMCA. While certain aspects of the USMCA are expected to be positive, others, including potentially higher regulatory compliance costs, may have an adverse impact on our business. It remains unclear what the U.S.

administration or foreign governments, including China, will or will not do with respect to tariffs, NAFTA, USMCA or other international trade agreements and policies. A trade war, other governmental action related to tariffs or international trade agreements, including NAFTA and USMCA, changes in U.S. social, political, regulatory and economic conditions or in laws and policies governing foreign trade, manufacturing, development and investment in the territories and countries where we currently manufacture and sell products, and any resulting negative sentiments towards the U.S. as a result of such changes, could have a material adverse effect on our business, financial condition, results of operations and cash flows.

We may experience cost and other inflation.
In the past, we have experienced material cost and other inflation in a number of our businesses. We strive for productivity improvements and implement increases in selling prices to help mitigate cost increases in raw materials (especially metals and resins), energy and other costs including wages, pension, health care and insurance. We continue to implement operational initiatives in order to mitigate the impacts of this inflation and continuously reduce our costs. However, these actions may not be successful in managing our costs or increasing our productivity. Continued cost inflation or failure of our initiatives to generate cost savings or improve productivity could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Intellectual property challenges may hinder our ability to develop, engineer and market our products.
Patents, non-compete agreements, proprietary technologies, customer relationships, trademarks, trade names and brand names are important to our business. Intellectual property protection, however, may not preclude competitors from developing products similar to ours or from challenging our names or products. Our pending patent applications, and our pending copyright and trademark registration applications, may not be allowed or competitors may challenge the validity or scope of our patents, copyrights or trademarks. In addition, our patents, copyrights, trademarks and other intellectual property rights may not provide us a significant competitive advantage. Over the past few years, we have noticed an increasing tendency for participants in our markets to use challenges to intellectual property as a means to compete. Patent and trademark challenges increase our costs to develop, engineer and market our products. We may need to spend significant resources monitoring, enforcing and defending our intellectual property rights and we may or may not be able to detect infringement by third parties. If we fail to successfully enforce our intellectual property rights or register new patents, our competitive position could suffer, which could have a material adverse effect on our business, financial condition, results of operations and cash flows.

We have significant goodwill and intangible assets and future impairment of our goodwill and intangible assets could have a material adverse effect on our results of operations.
We test goodwill and other indefinite-lived intangible assets for impairment on at least an annual basis, and more frequently if circumstances warrant. As of December 31, 2018 our goodwill and intangible assets were $2,349 million and represented 62% of our total assets. Declines in fair market value could result in future goodwill and intangible asset impairment charges.

A loss of, or material cancellation, reduction, or delay in purchases by, one or more of our largest customers could harm our business.
Our net sales to our largest customer represented approximately 15% of our consolidated net sales in 2018. While we do not have any other customers that accounted for 10% or more of our consolidated net sales in 2018, we have other customers that are key to the success of our business. Our concentration of sales to a relatively small number of larger customers makes our relationship with each of these customers important to our business. Our success is dependent on retaining these customers, which requires us to successfully manage relationships and anticipate the needs of our customers in the channels in which we sell our products. Our customers also may be impacted by economic conditions in the industries of those customers, which could result in reduced demand for our products. We cannot provide assurance that we will be able to retain our largest customers. In addition, some of our customers may shift their purchases to our competitors in the future. The loss of one or more of our largest customers, any material cancellation, reduction, or delay in purchases by these customers, or our inability to successfully develop relationships with additional customers could have a material adverse effect on our business, financial condition, results of operations and cash flows.

A material disruption at any of our manufacturing facilities could cause us to be unable to meet customer demands or increase our costs.
If operations at any of our manufacturing facilities were to be disrupted as a result of significant equipment failures, natural disasters, earthquakes, power outages, fires, explosions, terrorism, adverse weather conditions, labor disputes or other reasons, we may be unable to fill customer orders and otherwise meet customer demand for our products, which could have a material adverse effect on our business, financial condition, results of operations and cash flows. Interruptions in production, in particular at our manufacturing facilities, could increase our costs and reduce our sales. Any interruption in production capability could require us to make substantial capital expenditures to fill customer orders. We maintain property damage insurance that we believe to be adequate to provide for reconstruction of facilities and equipment, as well as business interruption insurance to mitigate losses resulting from any production interruption or shutdown caused by an insured loss. However, any recovery under our insurance policies may not offset the lost sales or increased costs that may be experienced

during the disruption of operations, which could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Seasonality of sales and weather conditions could have a material adverse effect on our financial results.
We experience seasonal demand with end-customers and end-users within each of our business segments. Demand for pool equipment in the Aquatic Systems segment, water filtration products in the Filtration Solutions segment, and residential water supply, infrastructure and agricultural products in the Flow Technologies segment follows warm weather trends and is at seasonal highs from April to August. While we attempt to mitigate the magnitude of the sales spike in the Aquatic Systems and Flow Technologies segments by employing some advance sale "early buy" programs (generally including extended payment terms and/or additional discounts), we cannot provide any assurance that such programs will be successful. In addition, seasonal effects in the Flow Technologies segment may vary from year to year and be impacted by weather patterns, particularly by temperature, heavy flooding and droughts.

Covenants in our debt instruments may adversely affect us.
Our credit agreements and indentures contain customary financial covenants, including those that limit the amount of our debt, which may restrict the operations of our business and our ability to incur additional debt to finance acquisitions. Our ability to meet the financial covenants can be affected by events beyond our control, and we cannot provide assurance that we will meet those tests. A breach of any of these covenants could result in a default under our credit agreements or indentures. Upon the occurrence of an event of default under any of our credit facilities or indentures, the lenders or trustees could elect to declare all amounts outstanding thereunder to be immediately due and payable and, in the case of credit facility lenders, terminate all commitments to extend further credit. If the lenders or trustees accelerate the repayment of borrowings, we cannot provide assurance that we will have sufficient assets to repay our credit facilities and our other indebtedness. Furthermore, acceleration of any obligation under any of our material debt instruments will permit the holders of our other material debt to accelerate their obligations, which could have a material adverse effect on our financial condition.

We may increase our debt or raise additional capital or our credit ratings may be downgraded in the future, which could affect our financial condition, and may decrease our profitability.
As of December 31, 2018 , we had $788 million of total debt outstanding. We may increase our debt or raise additional capital in the future, subject to restrictions in our debt agreements. If our cash flow from operations is less than we anticipate, if our cash requirements are more than we expect, or if we intend to finance acquisitions, we may require more financing. However, debt or equity financing may not be available to us on acceptable terms, if at all. If we incur additional debt or raise equity through the issuance of additional capital shares, the terms of the debt or capital shares issued may give the holders rights, preferences and privileges senior to those of holders of our ordinary shares, particularly in the event of liquidation. The terms of the debt may also impose additional and more stringent restrictions on our operations than we currently have. If we raise funds through the issuance of additional equity, the percentage ownership of existing shareholders in our company would decline. If we are unable to raise additional capital when needed, our financial condition could be adversely affected. Unfavorable changes in the ratings that rating agencies assign to our debt may ultimately negatively impact our access to the debt capital markets and increase the costs we incur to borrow funds. If ratings for our debt fall below investment grade, our access to the debt capital markets may become restricted. Additionally, our credit agreements generally include an increase in interest rates if the ratings for our debt are downgraded.

Our leverage could have a material adverse effect on our business, financial condition or results of operations.
Our ability to make payments on and to refinance our indebtedness, including our existing debt as well as any future debt that we may incur, will depend on our ability to generate cash in the future from operations, financings or asset sales. Our ability to generate cash is subject to general economic, financial, competitive, legislative, regulatory and other factors that are beyond our control. If we are not able to repay or refinance our debt as it becomes due, we may be forced to sell assets or take other disadvantageous actions, including (i) reducing financing in the future for working capital, capital expenditures and general corporate purposes or (ii) dedicating an unsustainable level of our cash flow from operations to the payment of principal and interest on our indebtedness. The lenders who hold such debt could also accelerate amounts due, which could potentially trigger a default or acceleration of any of our other debt.

Disruptions in the financial markets could adversely affect us, our customers and our suppliers by increasing funding costs or reducing availability of credit.
In the normal course of our business, we may access credit markets for general corporate purposes, which may include repayment of indebtedness, acquisitions, additions to working capital, repurchase of shares, capital expenditures and investments in our subsidiaries. Although we expect to have sufficient liquidity to meet our foreseeable needs, our access to and the cost of capital could be negatively impacted by disruptions in the credit markets, which have occurred in the past and made financing terms for borrowers unattractive or unavailable. These factors may make it more difficult or expensive for us to access credit markets if the need arises. In addition, these factors may make it more difficult for our suppliers to meet demand for their products or for prospective customers to commence new projects, as customers and suppliers may experience

increased costs of debt financing or difficulties in obtaining debt financing. Disruptions in the financial markets have had adverse effects on other areas of the economy and have led to a slowdown in general economic activity that may continue to adversely affect our businesses. One or more of these factors could adversely affect our business, financial condition, results of operations or cash flows.

Our share price may fluctuate significantly.
We cannot predict the prices at which our shares may trade. The market price of our shares may fluctuate widely, depending on many factors, some of which may be beyond our control, including:

- actual or anticipated fluctuations in our results of operations due to factors related to our business;
- success or failure of our business strategy;
- our quarterly or annual earnings, or those of other companies in our industry;
- our ability to obtain third-party financing as needed;
- announcements by us or our competitors of significant acquisitions or dispositions;
- changes in accounting standards, policies, guidance, interpretations or principles;
- changes in earnings estimates or guidance by us or securities analysts or our ability to meet those estimates or guidance;
- the operating and share price performance of other comparable companies;
- investor perception of us;
- overall market fluctuations;
- results from any material litigation, government investigations or environmental liabilities;
- natural or other environmental disasters;
- changes in laws and regulations affecting our business; and
- general economic conditions and other external factors.

Stock markets in general have experienced volatility that has often been unrelated to the operating performance of a particular company. These broad market fluctuations could have a material adverse effect on our share price.

Risks Relating to Legal, Regulatory and Compliance Matters

Violations of the U.S. Foreign Corrupt Practices Act and similar anti-corruption laws outside the U.S. could have a material adverse effect on us.
The FCPA and similar anti-corruption laws in other jurisdictions generally prohibit companies and their intermediaries from making improper payments to government officials or other persons for the purpose of obtaining or retaining business. Recent years have seen a substantial increase in anti-bribery law enforcement activity, with more frequent and aggressive investigations and enforcement proceedings by both the U.S. Department of Justice and the SEC, increased enforcement activity by non-U.S. regulators and increases in criminal and civil proceedings brought against companies and individuals. Our policies mandate compliance with these anti-bribery laws. We operate in many parts of the world that are recognized as having governmental and commercial corruption and in certain circumstances, strict compliance with anti-bribery laws may conflict with local customs and practices. Because many of our customers and end users are involved in infrastructure construction and energy production, they are often subject to increased scrutiny by regulators. We cannot assure you that our internal control policies and procedures will always protect us from reckless or criminal acts committed by our employees or third-party intermediaries. In the event that we believe or have reason to believe that our employees or agents have or may have violated applicable anti-corruption laws, including the FCPA we may be required to investigate or have outside counsel investigate the relevant facts and circumstances, which can be expensive and require significant time and attention from senior management. Violations of these laws may require self-disclosure to government agencies and result in criminal or civil sanctions, which could disrupt our business and result in a material adverse effect on our reputation, business, financial condition, results of operations and cash flows.

Our failure to satisfy international trade compliance regulations, and changes in U.S. government sanctions, could have a material adverse effect on us.
Our global operations require importing and exporting goods and technology across international borders on a regular basis. Certain of the products we manufacture are “dual use” products, which are products that may have both civil and military applications, or may otherwise be involved in weapons proliferation, and are often subject to more stringent export controls.

From time to time, we obtain or receive information alleging improper activity in connection with imports or exports. Our policy mandates strict compliance with U.S. and non-U.S. trade laws applicable to our products. However, even when we are in strict compliance with law and our policies, we may suffer reputational damage if certain of our products are sold through various intermediaries to entities operating in sanctioned countries. When we receive information alleging improper activity, our policy is to investigate that information and respond appropriately, including, if warranted, reporting our findings to relevant government authorities. Nonetheless, our policies and procedures may not always protect us from actions that would violate U.S. and/or non-U.S. laws. Any improper actions could subject us to civil or criminal penalties, including material monetary fines, or other adverse actions including denial of import or export privileges, and could damage our reputation and business prospects.

We are exposed to potential environmental laws, liabilities and litigation.

We are subject to U.S. federal, state, local and non-U.S. laws and regulations governing our environmental practices, public and worker health and safety, and the indoor and outdoor environment. Compliance with these environmental, health and safety regulations could require us to satisfy environmental liabilities, increase the cost of manufacturing our products or otherwise have a material adverse effect on our business, financial condition, results of operations and cash flows. Any violations of these laws by us could cause us to incur unanticipated liabilities. We are also required to comply with various environmental laws and maintain permits, some of which are subject to renewal from time to time, for many of our businesses and we could suffer if we are unable to renew existing permits or to obtain any additional permits that we may require. Compliance with environmental requirements also could require significant operating or capital expenditures or result in significant operational restrictions. We cannot assure you that we have been or will be at all times in compliance with environmental and health and safety laws. If we violate these laws, we could be fined, criminally charged or otherwise sanctioned by regulators.

We have been named as defendant, target or a potentially responsible party ("PRP") in a number of environmental clean-ups relating to our current or former business units. We have disposed of a number of businesses in recent years and in certain cases, we have retained responsibility and potential liability for certain environmental obligations. We have received claims for indemnification from certain purchasers. We may be named as a PRP at other sites in the future for existing business units, as well as both divested and acquired businesses. In addition to clean-up actions brought by governmental authorities, private parties could bring personal injury or other claims due to the presence of, or exposure to, hazardous substances.

Certain environmental laws impose liability on current or previous owners or operators of real property for the cost of removal or remediation of hazardous substances at their properties or at properties at which they have disposed of hazardous substances. We have projects underway at several current and former manufacturing facilities to investigate and remediate environmental contamination resulting from our past operations or by other businesses that previously owned or used the properties. The cost of clean-up and other environmental liabilities can be difficult to accurately predict. In addition, environmental requirements change and tend to become more stringent over time. Our eventual environmental clean-up costs and liabilities could exceed the amount of our current reserves.

Our subsidiaries are party to asbestos-related product litigation that could adversely affect our financial condition, results of operations and cash flows.

Our subsidiaries, along with numerous other companies, are named as defendants in a substantial number of lawsuits based on alleged exposure to asbestos-containing materials, substantially all of which relate to our discontinued operations. These cases typically involve product liability claims based primarily on allegations of manufacture, sale or distribution of industrial products that either contained asbestos or were attached to or used with asbestos-containing components manufactured by third parties. Each case typically names between several dozen to more than a hundred corporate defendants. Historically, our subsidiaries have been identified as defendants in asbestos-related claims. Our strategy has been, and continues to be, to mount a vigorous defense aimed at having unsubstantiated suits dismissed, and, only where appropriate, settling claims before trial. As of December 31, 2018 , there were approximately 600 claims pending against our subsidiaries, substantially all of which relate to our discontinued operations. We cannot predict with certainty the extent to which we will be successful in litigating or otherwise resolving lawsuits in the future and we continue to evaluate different strategies related to asbestos claims filed against us including entity restructuring and judicial relief. Unfavorable rulings, judgments or settlement terms could have a material adverse impact on our business and financial condition, results of operations and cash flows.

We are exposed to certain regulatory and financial risks related to climate change.

Climate change is receiving ever increasing attention worldwide. Many scientists, legislators and others attribute global warming to increased levels of greenhouse gases, which has led to significant legislative and regulatory efforts to limit greenhouse gas emissions. The U.S. Environmental Protection Agency ("EPA") has published findings that emissions of carbon dioxide, methane, and other greenhouse gases ("GHGs") present an endangerment to public health and the environment because emissions of such gases are, according to the EPA, contributing to the warming of the earth's atmosphere and other climate changes. Based on these findings, the EPA has implemented regulations that require reporting of GHG emissions, or

that limit emissions of GHGs from certain mobile or stationary sources. In addition, the U.S. Congress and federal and state regulatory agencies have considered other legislation and regulatory proposals to reduce emissions of GHGs, and many states have already taken legal measures to reduce emissions of GHGs, primarily through the development of GHG inventories, GHG permitting and/or regional GHG cap-and-trade programs. It is uncertain whether, when and in what form a federal mandatory carbon dioxide emissions reduction program, or other state programs, may be adopted. Similarly, certain countries have adopted the Kyoto Protocol and/or the Paris Accord, and these and other existing international initiatives or those under consideration could affect our international operations. To the extent our customers, particularly our energy and industrial customers, are subject to any of these or other similar proposed or newly enacted laws and regulations, we are exposed to risks that the additional costs by customers to comply with such laws and regulations could impact their ability or desire to continue to operate at similar levels in certain jurisdictions as historically seen or as currently anticipated, which could negatively impact their demand for our products and services. These actions could also increase costs associated with our operations, including costs for raw materials and transportation. It is uncertain what laws will be enacted and therefore we cannot predict the potential impact of such laws on our future financial condition, results of operations and cash flows.

Increased information technology security threats and computer crime pose a risk to our systems, networks, products and services, and we are exposed to potential regulatory, financial and reputational risks relating to the protection of our data.

We rely upon information technology systems and networks in connection with a variety of business activities, some of which are managed by third parties. As our business increasingly interfaces with employees, customers, dealers and suppliers using information technology systems and networks, we are subject to an increased risk to the secure operation of these systems and networks. The secure operation of these information technology systems and networks is critical to our business operations and strategy. Information technology security threats -- from user error to attacks designed to gain unauthorized access to our systems, networks and data -- are increasing in frequency and sophistication. These threats pose a risk to the security of our systems and networks and the confidentiality, availability and integrity of the data we process and maintain. Establishing systems and processes to address these threats may increase our costs. We have experienced data breaches, and, although we have determined such data breaches to be immaterial and such data breaches have not had a material adverse effect on our financial condition, results of operations or cash flows, there can be no assurance of similar results in the future. Should future attacks succeed in the theft of assets, exporting sensitive data or financial information or controlling sensitive systems or networks, it could expose us and our employees, customers, dealers and suppliers to the theft of assets, misuse of information or systems, the compromising of confidential information, manipulation and destruction of data, defective products, and production downtimes and operations disruptions. The occurrence of any of these events could have a material adverse effect on our reputation, business, financial condition, results of operations and cash flows. In addition, such breaches in security could result in litigation, regulatory action and potential liability and the costs and operational consequences of implementing further data protection measures.

Changes in data privacy laws and our ability to comply with them could have a material adverse effect on us.

We collect and store data that is sensitive to Pentair and its employees, customers, dealers and suppliers. A variety of state, national, foreign and international laws and regulations apply to the collection, use, retention, protection, security, disclosure, transfer and other processing of personal and other data. Many foreign data privacy regulations, including the General Data Protection Regulation (“GDPR”), which became effective in the European Union in 2018, are more stringent than those in the United States. These laws and regulations are rapidly evolving and changing, and could have an adverse effect on our operations. Companies’ obligations and requirements under these laws and regulations are subject to uncertainty in how they may be interpreted by government authorities. The costs of compliance with, and the other burdens imposed by, these and other laws or regulatory actions may increase our operational costs, and/or result in interruptions or delays in the availability of systems. In the case of non-compliance these laws, including the GDPR, regulators have the authority to levy significant fines. In addition, if there is a breach of privacy, we may be required to make notifications under data privacy regulations. The occurrence of any of these events could have a material adverse effect on our reputation, business, financial condition, results of operations and cash flows.

We may be negatively impacted by litigation and other claims.

We are currently, and may in the future, become subject to litigation and other claims. These legal proceedings are typically claims that relate to the conduct of our business and include, without limitation, claims relating to commercial or contractual disputes with suppliers, customers or parties to acquisitions and divestitures, intellectual property matters, environmental, safety and health matters, product liability, the use or installation of our products, consumer matters, and employment and labor matters. The outcome of such legal proceedings cannot be predicted with certainty and some may be disposed of unfavorably to us. We also may not have insurance that covers such claims. While we currently maintain what we believe to be suitable product liability insurance, we may not be able to maintain this insurance on acceptable terms and this insurance may not provide adequate protection against potential or previously existing liabilities. In addition, we self-insure a portion of product liability claims. Further, some of our business involves the sale of our products to customers that are constructing large and complex systems, facilities or other capital projects and while we generally try to limit our exposure liquidated damages,

consequential damages and other damages in the contracts for these projects, we could be exposed to significant monetary damages and other liabilities in connection with the sale of our products for these projects for a variety of reasons. Successful claims or litigation against us for significant amounts could have a material adverse effect on our reputation, business, financial condition, results of operations and cash flows.

Risks Relating to the Separation of nVent Electric plc by Spin-off

We may be unable to achieve some or all of the benefits that we expect to achieve from the spin-off.
On April 30, 2018, we completed the separation of our Electrical business through the spin-off nVent Electric plc to our shareholders. Following the spin-off, we are a smaller and less diversified company with a narrower business focus and, as a result, we may be more vulnerable to changing market conditions. Although we believe that the spin-off of nVent Electric plc will provide financial, operational, managerial and other benefits to us and our shareholders, the spin-off may not provide the results on the scope or on the scale we anticipate, and we may not realize any or all of the intended benefits. In addition, we have and will continue to incur one-time costs and ongoing costs in connection with, or as a result of, the spin-off, including costs of operating as independent, publicly-traded companies that the two businesses are no longer able to share. Those costs may exceed our estimates or could negate some of the benefits we expect to realize. If we do not realize the intended benefits or if our costs exceed our estimates, we could suffer a material adverse effect on the business, financial condition, results of operations, cash flows and trading prices.

The spin-off transaction could result in substantial tax liability to us and our shareholders if the spin-off does not qualify as a tax-free transaction.
The spin-off was conditioned on our receipt of opinions of tax advisors and tax rulings from taxing authorities. However, these tax opinions will not be binding on taxing authorities. Accordingly, taxing authorities or the courts may reach conclusions with respect to the spin-off that are different from the conclusions reached in such opinions. Moreover, such opinions were based on certain statements and representations made by us, which, if incomplete or inaccurate in any material respect, could invalidate the opinions. If the spin-off and certain related transactions were determined to be taxable, we could be subject to a substantial tax liability that could have a material adverse effect on our financial condition, results of operations and cash flows. In addition, if the spin-off were taxable, each holder of our ordinary shares who received shares of nVent Electric plc in the spin-off would generally be treated as receiving a taxable distribution of property in an amount equal to the fair market value of the shares received.

We may be exposed to claims and liabilities as a result of the spin-off.
In connection with the spin-off, we and nVent Electric plc entered into a separation and distribution agreement and various other agreements, including a transition services agreement, a tax matters agreement and an employee matters agreement. These agreements provide for the performance of services by each company for the benefit of the other for a period of time after the spin-off and provide for specific indemnity and liability obligations. The indemnity rights we have against nVent under the agreements may not be sufficient to protect us. In addition, our indemnity obligations to nVent may be significant and these risks could negatively affect our financial condition, results of operations and cash flows.

Risks Relating to Our Jurisdiction of Incorporation in Ireland and Tax Residency in the U.K.

We are subject to changes in law and other factors that may not allow us to maintain a worldwide effective corporate tax rate that is competitive in our industry.
While we believe that we should be able to maintain a worldwide effective corporate tax rate that is competitive in our industry, we cannot give any assurance as to what our effective tax rate will be in the future because of, among other things, uncertainty regarding tax policies of the jurisdictions where we operate. Also, the tax laws of the U.S., the U.K., Ireland and other jurisdictions could change in the future, and such changes could cause a material change in our worldwide effective corporate tax rate. These changes include the Tax Cuts and Jobs Act enacted in the U.S. in December 2017, which made significant changes to certain U.S. tax laws relevant to us, including limitations on the deductibility of certain interest expense and employee compensation, limitations on various other deductions and credits, the imposition of taxes in respect of certain cross-border payments or transfers, the imposition of taxes on certain earnings of non-U.S. entities on a current basis, and changes in the timing of the recognition of income or its character. These items and regulations and guidance implementing the Tax Cuts and Jobs Act could materially adversely affect our financial condition, results of operations, cash flows or our effective tax rate in future reporting periods. In addition, legislative action could be taken by the U.S., the U.K., Ireland or the European Union which could override tax treaties or modify tax statutes or regulations upon which we expect to rely and adversely affect our effective tax rate. We cannot predict the outcome of any specific legislative proposals. If proposals were enacted that had the effect of disregarding our incorporation in Ireland or limiting our ability as an Irish company to maintain tax residency in the U.K. and take advantage of the tax treaties among the U.S., the U.K. and Ireland, we could be subject to increased taxation, which could materially adversely affect our financial condition, results of operations, cash flows or our effective tax rate in future reporting periods.

A change in our tax residency could have a negative effect on our future profitability, and may trigger taxes on dividends or exit charges.
Under current Irish legislation, a company is regarded as resident for tax purposes in Ireland if it is centrally managed and controlled in Ireland, or, in certain circumstances, if it is incorporated in Ireland. Under current U.K. legislation, a company that is centrally managed and controlled in the U.K. is regarded as resident in the U.K. for taxation purposes unless it is treated as resident in another jurisdiction pursuant to any appropriate double tax treaty with the U.K. Other jurisdictions may also seek to assert taxing jurisdiction over Pentair.

Where a company is treated as tax resident under the domestic laws of both the U.K. and Ireland, article 4(3) of the Double Tax Convention between Ireland and the U.K. (the "residence tie-breaker") currently provides that the company shall be treated as resident only in one of those two jurisdictions if its place of effective management is situated in that jurisdiction.

The Organisation for Economic Co-operation and Development has proposed a number of measures relating to the tax treatment of multinationals, some of which are to be implemented by amending double tax treaties through a multilateral instrument (the "MLI"). The MLI has been signed and ratified by a number of countries, including Ireland and the U.K. The MLI allows signatories to opt into or out of certain changes: the effect for a given double tax convention depends on the options chosen by the two contracting states. Ireland and the U.K. have confirmed that they intend to change the residence tie-breaker so that a company will not cease being dual resident until there is a determination by the tax authorities of the two contracting states, instead of an objective application of the place of effective management test. The MLI has not yet entered into force effect in order to amend the residence tie-breaker.

Under Ireland's domestic tax residency rules, Pentair should not be Irish resident until January 1, 2021 (provided that there is no change in ownership and no major change in the nature or conduct of the business of the company before that date, in which case the residence tie-breaker should apply from the date of the change of ownership). Accordingly, we do not expect the change to the residence tie-breaker to have effect until January 1, 2021 at the earliest.

It is possible that in the future, whether as a result of a change in law (including the entry into force and effect of the MLI) or the practice of any relevant tax authority or as a result of any change in the conduct of our affairs, we could become, or be regarded as having become, resident in a jurisdiction other than the U.K. If Pentair ceases to be resident in the U.K. and becomes resident in another jurisdiction, it may be subject to U.K. exit charges, and could become liable for additional tax charges in the other jurisdiction (including dividend withholding taxes or corporate income tax charges). If Pentair were to be treated as resident in more than one jurisdiction, it could be subject to taxation in multiple jurisdictions. If, for example, Pentair were considered to be a tax resident of Ireland, we could become liable for Irish corporation tax and any dividends paid by it could be subject to Irish dividend withholding tax.

Irish law differs from the laws in effect in the United States and may afford less protection to holders of our securities.
It may not be possible to enforce court judgments obtained in the U.S. against us in Ireland based on the civil liability provisions of the U.S. federal or state securities laws. In addition, there is some uncertainty as to whether the courts of Ireland would recognize or enforce judgments of U.S. courts obtained against us or our directors or officers based on the civil liabilities provisions of the U.S. federal or state securities laws or hear actions against us or those persons based on those laws. We have been advised that the U.S. currently does not have a treaty with Ireland providing for the reciprocal recognition and enforcement of judgments in civil and commercial matters. Therefore, a final judgment for the payment of money rendered by any U.S. federal or state court based on civil liability, whether or not based solely on U.S. federal or state securities laws, would not automatically be enforceable in Ireland.

As an Irish company, we are governed by the Irish Companies Act, which differs in some material respects from laws generally applicable to U.S. corporations and shareholders, including, among others, differences relating to interested director and officer transactions and shareholder lawsuits. Likewise, the duties of directors and officers of an Irish company generally are owed to the company only. Shareholders of Irish companies generally do not have a personal right of action against directors or officers of the company and may exercise such rights of action on behalf of the company only in limited circumstances. Accordingly, holders of our securities may have more difficulty protecting their interests than would holders of securities of a corporation incorporated in a jurisdiction of the U.S.

Transfers of our ordinary shares may be subject to Irish stamp duty.
Transfers of our ordinary shares effected by means of the transfer of book entry interests in the Depository Trust Company ("DTC") will not be subject to Irish stamp duty. However, if you hold your ordinary shares directly rather than beneficially through DTC, any transfer of your ordinary shares could be subject to Irish stamp duty (currently at the rate of 1 percent of the higher of the price paid or the market value of the shares acquired). Payment of Irish stamp duty is generally a legal obligation of the transferee.

We currently intend to pay, or cause one of our affiliates to pay, stamp duty in connection with share transfers made in the ordinary course of trading by a seller who holds shares directly to a buyer who holds the acquired shares beneficially. In other cases we may, in our absolute discretion, pay or cause one of our affiliates to pay any stamp duty. Our articles of association provide that, in the event of any such payment, we (i) may seek reimbursement from the buyer, (ii) will have a lien against the shares acquired by such buyer and any dividends paid on such shares and (iii) may set-off the amount of the stamp duty against future dividends on such shares. Parties to a share transfer may assume that any stamp duty arising in respect of a transaction in our shares has been paid unless one or both of such parties is otherwise notified by us.

Our ordinary shares, received by means of a gift or inheritance could be subject to Irish capital acquisitions tax.
Irish capital acquisitions tax ("CAT") could apply to a gift or inheritance of our ordinary shares irrespective of the place of residence, ordinary residence or domicile of the parties. This is because our shares will be regarded as property situated in Ireland. The person who receives the gift or inheritance has primary liability for CAT. Gifts and inheritances passing between spouses are exempt from CAT. Children have a tax-free threshold of €320,000 per lifetime in respect of taxable gifts or inheritances received from their parents for periods on or after October 10, 2018.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our principal office is located in leased premises in London, U.K., and our management office in the U.S. is located in leased premises in Minneapolis, Minnesota.

Our operations are conducted in facilities throughout the world. These facilities house manufacturing and distribution operations, as well as sales and marketing, engineering and administrative offices. The following is a summary of our principal properties, including manufacturing, distribution, sales offices and service centers:

		No. of Facilities			
	Location	Manufacturing	Distribution	Sales and Corporate Offices	Service Centers
Aquatic Systems	22 U.S. cities and 12 foreign countries	9	11	13	1
Filtration Solutions	14 U.S. cities and 40 foreign countries	19	9	26	—
Flow Technologies	15 U.S. cities and 35 foreign countries	20	12	8	10
Corporate	3 U.S. cities and 4 foreign countries	—	—	7	—
Total		48	32	54	11

We believe that our production facilities as well as the related machinery and equipment, are well maintained and suitable for their purpose and are adequate to support our businesses.

ITEM 3. LEGAL PROCEEDINGS

We have been, and in the future may be, made parties to a number of actions filed or have been, and in the future may be, given notice of potential claims relating to the conduct of our business, including those relating to commercial or contractual disputes with suppliers, customers or parties to acquisitions and divestitures, intellectual property matters, environmental, safety and health matters, product liability, the use or installation of our products, consumer matters, and employment and labor matters.

While we believe that a material impact on our consolidated financial position, results of operations or cash flows from any such future claims or potential claims is unlikely, given the inherent uncertainty of litigation, a remote possibility exists that a

future adverse ruling or unfavorable development could result in future charges that could have a material adverse impact. We do and will continue to periodically reexamine our estimates of probable liabilities and any associated expenses and receivables and make appropriate adjustments to such estimates based on experience and developments in litigation. As a result, the current estimates of the potential impact on our consolidated financial position, results of operations and cash flows for the proceedings and claims described in the notes to our consolidated financial statements could change in the future.

Asbestos matters

Our subsidiaries and numerous other unaffiliated companies are named as defendants in personal injury lawsuits based on alleged exposure to asbestos-containing materials. These cases typically involve product liability claims based primarily on allegations of manufacture, sale or distribution of industrial products that either contained asbestos or were attached to or used with asbestos-containing components manufactured by third-parties. Each case typically names between several dozen to more than a hundred corporate defendants. Our historical strategy has been to mount a vigorous defense aimed at having unsubstantiated suits dismissed, and, where appropriate, settling suits before trial. Although a large percentage of litigated suits have been dismissed, we cannot predict the extent to which we will be successful in resolving lawsuits in the future.

As of December 31, 2018 , there were approximately 600 claims outstanding against our subsidiaries. This amount is not adjusted for claims that are not actively being prosecuted, identified incorrect defendants, or duplicated other actions, which would ultimately reflect our current estimate of the number of viable claims made against us, our affiliates, or entities for which we assumed responsibility in connection with acquisitions or divestitures. In addition, the amount does not include certain claims pending against third parties for which we have been provided an indemnification.

Environmental matters

We have been named as defendant, target or a PRP in a number of environmental clean-ups relating to our current or former business units. We have disposed of a number of businesses in recent years and in certain cases, we have retained responsibility and potential liability for certain environmental obligations. We have received claims for indemnification from certain purchasers. We may be named as a PRP at other sites in the future for existing business units, as well as both divested and acquired businesses. In addition to cleanup actions brought by governmental authorities, private parties could bring personal injury or other claims due to the presence of, or exposure to, hazardous substances.

Certain environmental laws impose liability on current or previous owners or operators of real property for the cost of removal or remediation of hazardous substances at their properties or at properties at which they have disposed of hazardous substances. We have projects underway at several current and former manufacturing facilities to investigate and remediate environmental contamination resulting from our past operations or by other businesses that previously owned or used the properties.

Our accruals for environmental matters are recorded on a site-by-site basis when it is probable that a liability has been incurred and the amount of the liability can be reasonably estimated, based on current law and existing technologies. It can be difficult to estimate reliably the final costs of investigation and remediation due to various factors. In our opinion, the amounts accrued are appropriate based on facts and circumstances as currently known. As of December 31, 2018, our recorded reserves for environmental matters were not material. We do not anticipate our remaining environmental conditions will have a material adverse effect on our financial position, results of operations or cash flows. However, unknown conditions, new details about existing conditions or changes in environmental requirements may give rise to environmental liabilities that will exceed the amount of our current reserves and could have a material adverse effect in the future.

Product liability claims

We are subject to various product liability lawsuits and personal injury claims. A substantial number of these lawsuits and claims are insured and accrued for by Penwald, our captive insurance subsidiary. See discussion in ITEM 1 and ITEM 8, Note 1 of the Notes to Consolidated Financial Statements — Insurance subsidiary. Penwald records a liability for these claims based on actuarial projections of ultimate losses. For all other claims, accruals covering the claims are recorded, on an undiscounted basis, when it is probable that a liability has been incurred and the amount of the liability can be reasonably estimated based on existing information. The accruals are adjusted periodically as additional information becomes available. We have not experienced significant unfavorable trends in either the severity or frequency of product liability lawsuits or personal injury claims.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

EXECUTIVE OFFICERS OF THE REGISTRANT

Current executive officers of Pentair plc, their ages, current position and their business experience during at least the past five years are as follows:

Name	Age	Current Position and Business Experience
John L. Stauch	54	President and Chief Executive Officer since 2018; Executive Vice President and Chief Financial Officer 2007 — 2018; Chief Financial Officer of the Automation and Control Systems unit of Honeywell International Inc., 2005 — 2007; Vice President, Finance and Chief Financial Officer of the Sensing and Controls unit of Honeywell International Inc., 2004 — 2005; Vice President, Finance and Chief Financial Officer of the Automation & Control Products unit of Honeywell International Inc., 2002 — 2004; Chief Financial Officer and IT Director of PerkinElmer Optoelectronics, a unit of PerkinElmer, Inc., 2000 — 2002; Various executive, investor relations and managerial finance positions with Honeywell International Inc. and its predecessor AlliedSignal Inc., 1994 — 2000.
Kelly A. Baker	49	Executive Vice President and Chief Human Resources Officer since 2017; Chief Human Resources Officer of Patterson Companies, Inc. 2016 — 2017; Vice President of Human Resources, U.S. Retail Organization and Marketing Function of General Mills 2014 — 2016; Vice President of Human Resources, Corporate & Global Business Solutions of General Mills 2009 — 2014; Vice President of Diversity & Inclusion of General Mills 2005 — 2009; Various Human Resources leadership positions at General Mills 1995 — 2005.
Mark C. Borin	51	Executive Vice President and Chief Financial Officer since 2018; Senior Vice President and Chief Accounting Officer 2008 — 2018 and Treasurer 2015 — 2018; Partner in the audit practice of the public accounting firm KPMG LLP, 2000 — 2008; Various positions in the audit practice of KPMG LLP, 1989 — 2000.
Karl R. Frykman	58	Executive Vice President and Chief Operating Officer since 2018; Senior Vice President and President, Water segment 2017 — 2018; President, Water Quality Systems Global Business Unit, 2007 — 2016; President of Aquatic Systems' National Pool Tile group, 1998— 2007; Vice President of Operations for American Products, 1995 — 1998; Vice President of Anthony Pools, 1990 — 1995; Vice President of Poolsaver, 1988 — 1990.
John H. Jacko	61	Executive Vice President and Chief Growth Officer since 2018; Senior Vice President and Chief Marketing Officer 2017 — 2018; Vice President and Chief Marketing Officer of Kennametal Corporation, 2007 — 2016; Senior Vice President and Chief Marketing Officer of Flowserve Corporation, 2002 — 2007; Vice President of Marketing and Customer Management of Flowserve Corporation, 2001 — 2002; Various business leadership positions of Honeywell Aerospace, 1995 — 2001.
Karla C. Robertson	48	Executive Vice President, General Counsel and Secretary since 2018; General Counsel, Pentair plc Water segment 2017 — 2018; Executive Vice President, General Counsel and Corporate Secretary of SUPERVALU Inc. 2013 — 2017; Vice President, Employment, Compensation and Benefits Law of SUPERVALU Inc. 2012 — 2013; Director, Employment Law of SUPERVALU Inc. 2011 — 2012; Senior Counsel, Employment Law of SUPERVALU Inc. 2009 — 2011; Senior Employee Relations Counsel of Target Corporation 2006 — 2008; Associate, Faegre & Benson LLP 2000 — 2005; Judicial Clerk, United States District Court for the Southern District of Iowa, 1998 — 2000
Philip M. Rolchigo, Ph.D.	57	Executive Vice President and Chief Technology Officer since 2017; Vice President of Engineering and Technology Innovation 2007 — 2017; Business Development Director of GE Global Research Center 2006 — 2007; Director of Technology of GE Water & Process Technologies 2003 — 2006; Chief Technology Officer of Osmonics 2000 — 2003; Vice President of Research & Development of Osmonics 1998 — 2000; Chief Technology Officer of Membrex 1988 — 1998.

PART II

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

Our ordinary shares are listed for trading on the New York Stock Exchange ("NYSE") under the symbol "PNR." As of December 31, 2018 , there were 15,032 shareholders of record.

Pentair has paid 172 consecutive quarterly cash dividends, including most recently a dividend of $0.175 per share in the fourth quarter of 2018. In addition, the Board of Directors approved a plan to increase the dividend for 2019, which will mark the 43 rd consecutive year we have increased dividends, as adjusted for the spin-off of nVent.

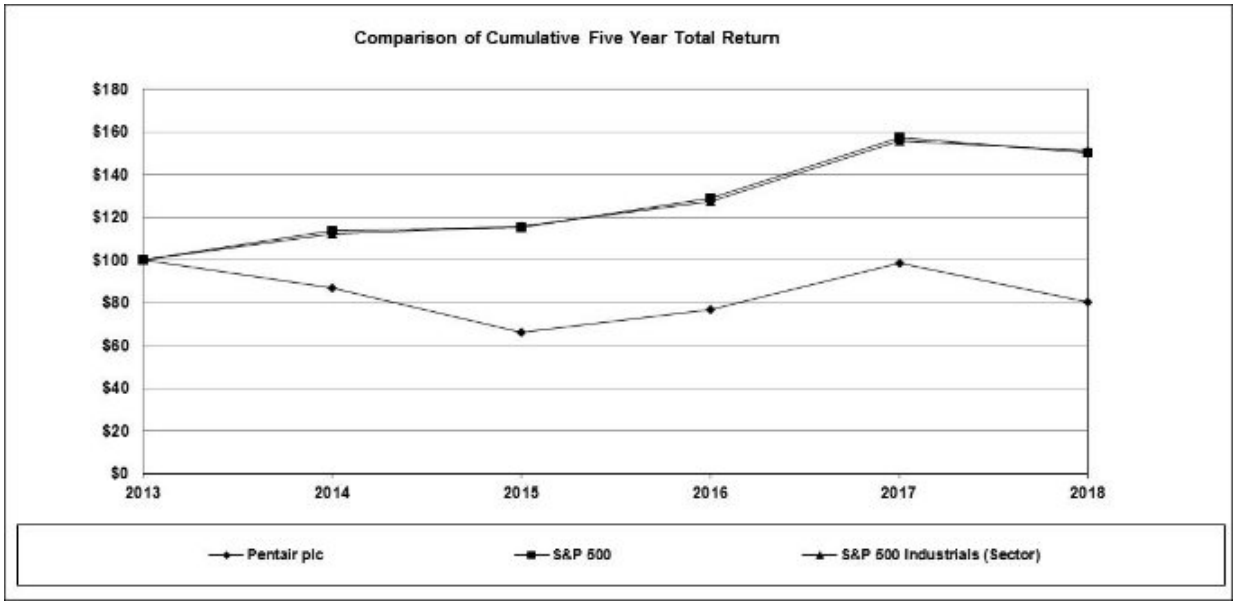
The timing, declaration and payment of future dividends to holders of our ordinary shares will depend upon many factors, including our financial condition and results of operations, the capital requirements of our businesses, industry practice and any other relevant factors.

Share Performance Graph

The following information under the caption "Share Performance Graph" in this ITEM 5 of this Annual Report on Form 10-K is not deemed to be "soliciting material" or to be "filed" with the SEC or subject to Regulation 14A or 14C under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), or to the liabilities of Section 18 of the Exchange Act and will not be deemed to be incorporated by reference into any filing under the Securities Act of 1933, as amended, or the Exchange Act, except to the extent we specifically incorporate it by reference into such a filing.

The following graph sets forth the cumulative total shareholder return on our ordinary shares for the last five years, assuming the investment of $100 on December 31, 2013 and the reinvestment of all dividends since that date to December 31, 2018 . The graph also contains for comparison purposes the S&P 500 Index and the S&P 500 Industrials Index, assuming the same investment level and reinvestment of dividends.

By virtue of our market capitalization, we are a component of the S&P 500 Index. On the basis of our size and diversity of businesses, we believe the S&P 500 Industrials Index is an appropriate published industry index for comparison purposes.



	Base Period December	INDEXED RETURNS Years ended December 31				
Company / Index	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Pentair plc	$ 100	$ 86.84	$ 66.16	$ 76.74	$ 98.74	$ 80.12
S&P 500 Index	100	113.69	115.26	129.05	157.22	150.33
S&P 500 Industrials Index	100	112.36	115.62	127.31	156.04	151.29

Purchases of Equity Securities

The following table provides information with respect to purchases we made of our ordinary shares during the fourth quarter of 2018 :

	(a)	(b)	(c)	(d)
	Total number of shares purchased	**Average price paid per share**	**Total number of shares purchased as part of publicly announced plans or programs**	**Dollar value of shares that may yet be purchased under the plans or programs**
October 1 – October 27	632	$ 41.29	—	$ 500,000,101
October 28 – November 24	809,872	39.90	625,162	473,603,480
November 25 – December 31	1,833,155	40.15	1,832,049	400,000,120
Total	2,643,659		2,457,211	

(a) The purchases in this column include 632 shares for the period October 1 – October 27 , 184,710 shares for the period October 28 – November 24 , and 1,106 shares for the period November 25 – December 31 deemed surrendered to us by participants in our 2012 Stock and Incentive Plan (the "2012 Plan") and earlier stock incentive plans that are now outstanding under the 2012 Plan (collectively the "Plans") to satisfy the exercise price or withholding of tax obligations related to the exercise of stock options and vesting of restricted shares.

(b) The average price paid in this column includes shares repurchased as part of our publicly announced plans and shares deemed surrendered to us by participants in the Plans to satisfy the exercise price for the exercise price of stock options and withholding tax obligations due upon stock option exercises and vesting of restricted and performance shares.

(c) The number of shares in this column represents the number of shares repurchased as part of our publicly announced plans to repurchase our ordinary shares up to a maximum dollar limit authorized by the Board of Directors, discussed below.

(d) On May 8, 2018, our Board of Directors authorized the repurchase of our ordinary shares up to a maximum dollar limit of $750.0 million . The 2018 authorization expires on May 31, 2021. We have $400.0 million remaining availability for repurchases under the 2018 authorization. From time to time, we may enter into a Rule 10b5-1 trading plan for the purpose of repurchasing shares under this authorization.

ITEM 6. SELECTED FINANCIAL DATA

The following table sets forth our selected historical financial data for the five years ended December 31, 2018 .

	Years ended December 31				
In millions, except per-share amounts	**2018**	**2017**	**2016**	**2015**	**2014**
Consolidated statements of operations and comprehensive income					
Net sales	$ 2,965.1	$ 2,845.7	$ 2,780.6	$ 2,812.4	$ 2,942.1
Operating income	436.7	378.3	354.4	304.7	226.8
Net income from continuing operations attributable to Pentair	321.7	114.1	178.2	170.9	122.3
Per ordinary share					
Basic					
Earnings per ordinary share from continuing operations attributable to Pentair	$ 1.83	$ 0.63	$ 0.98	$ 0.95	$ 0.64
Weighted average ordinary shares	175.8	181.7	181.3	180.3	190.6
Diluted					
Earnings per ordinary share from continuing operations attributable to Pentair	$ 1.81	$ 0.62	$ 0.97	$ 0.94	$ 0.63
Weighted average ordinary shares	177.3	183.7	183.1	182.6	193.7
Cash dividends declared and paid per ordinary share	$ 1.05	$ 1.38	$ 1.34	$ 1.28	$ 1.10
Cash dividends declared and unpaid per ordinary share	0.18	0.35	0.345	0.33	0.32
Consolidated balance sheets					
Total assets	$ 3,806.5	$ 8,633.7	$ 11,534.8	$ 11,833.4	$ 10,643.8
Total debt	787.6	1,440.7	4,279.2	4,685.8	2,988.4
Total equity	1,836.1	5,037.8	4,254.4	4,008.8	4,663.8

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

Forward-looking statements

This report contains statements that we believe to be "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. All statements, other than statements of historical fact are forward-looking statements. Without limitation, any statements preceded or followed by or that include the words "targets," "plans," "believes," "expects," "intends," "will," "likely," "may," "anticipates," "estimates," "projects," "should," "would," "positioned," "strategy," "future" or words, phrases or terms of similar substance or the negative thereof, are forward-looking statements. These forward-looking statements are not guarantees of future performance and are subject to risks, uncertainties, assumptions and other factors, some of which are beyond our control, which could cause actual results to differ materially from those expressed or implied by such forward-looking statements. These factors include overall global economic and business conditions impacting our business, including the strength of housing and related markets; competition and pricing pressures in the markets we serve; volatility in currency exchange rates; failure of markets to accept new product introductions and enhancements; the ability to successfully identify, finance, complete and integrate acquisitions, including the Aquion, Inc. ("Aquion") and Pelican Water Systems ("Pelican") acquisitions; the ability to achieve the benefits of our restructuring plans and cost reduction initiatives; risks associated with operating foreign businesses; the impact of material cost and other inflation; our ability to comply with laws and regulations; the impact of changes in laws, regulations and administrative policy, including those that limit U.S. tax benefits or impact trade agreements and tariffs; the outcome of litigation and governmental proceedings; the ability to realize the anticipated benefits from the Separation (as defined below); and the ability to achieve our long-term strategic operating goals. Additional information concerning these and other factors is contained in our filings with the U.S. Securities and Exchange Commission (the "SEC"), including this Annual Report on Form 10-K. All forward-looking statements speak only as of the date of this report. Pentair assumes no obligation, and disclaims any obligation, to update the information contained in this report.

Overview

Pentair plc and its consolidated subsidiaries ("we," "us," "our," "Pentair" or the "Company") is a pure play water industrial manufacturing company comprised of three reporting segments: Aquatic Systems, Filtration Solutions and Flow Technologies. We classify our operations into business segments based primarily on types of products offered and markets served. For the year ended December 31, 2018 , the Aquatic Systems, Filtration Solutions and Flow Technologies segments represented approximately 35% , 34% and 31% of total revenues, respectively.

Although our jurisdiction of organization is Ireland, we manage our affairs so that we are centrally managed and controlled in the United Kingdom (the "U.K.") and therefore have our tax residency in the U.K.

On April 28, 2017, we completed the sale of the Valves & Controls business to Emerson Electric Co. for $3.15 billion . The sale resulted in a gain of $181.1 million , net of tax. The results of the Valves & Controls business have been presented as discontinued operations for all periods presented. The Valves & Controls business was previously disclosed as a stand-alone reporting segment.

On April 30, 2018, we completed the separation of our Electrical business from the rest of Pentair (the "Separation") by means of a dividend in specie of the Electrical business, which was effected by the transfer of the Electrical business from Pentair to nVent and the issuance by nVent of nVent ordinary shares directly to Pentair shareholders (the "Distribution"). We did not retain an equity interest in nVent. The results of the Electrical business have been presented as discontinued operations for all periods presented. The Electrical business was previously disclosed as a stand-alone reporting segment.

Key trends and uncertainties regarding our existing business

The following trends and uncertainties affected our financial performance in 2018 and 2017 , and will likely impact our results in the future:

- During 2018 and 2017, we continued execution of certain business restructuring initiatives aimed at reducing our fixed cost structure and realigned our business in contemplation of the Separation and Distribution of nVent. We expect these actions will contribute to margin growth in 2019.
- We have identified specific product and geographic market opportunities that we find attractive and continue to pursue, both within and outside the U.S. We are reinforcing our businesses to more effectively address these opportunities through research and development and additional sales and marketing resources. Unless we successfully penetrate these markets, our core sales growth will likely be limited or may decline.

- We have experienced material and other cost inflation. We strive for productivity improvements, and we implement increases in selling prices to help mitigate this inflation. We expect the current economic environment will result in continuing price volatility for many of our raw materials, and we are uncertain as to the timing and impact of these market changes.
- Proposed regulations as part of the Tax Cuts and Jobs Act, enacted in the U.S. in December 2017, may place limitations on the deductibility of certain interest expense for U.S. tax purposes. These proposed regulations could materially adversely affect our financial condition, results of operations, cash flows or our effective tax rate in future reporting periods when enacted.

In 2019 , our operating objectives include the following:

- Accelerating PIMS, with specific focus on the area of commercial excellence and acquisition integrations;
- Delivering our growth priorities through new products and global and market expansion, specifically in the areas of pool and residential and commercial water treatment especially through acquisitions and focus on China and Southeast Asia;
- Optimizing our technological capabilities to increasingly generate innovative new products and advance digital transformation; and
- Building a growth culture and delivering on our commitments while living our Win Right values.

In January 2019, as part of Filtration Solutions, we entered into definitive agreements to acquire Aquion and Pelican for $160.0 million and $120.0 million in cash, respectively, and subject to certain customary adjustments. We completed the Aquion acquisition on February 13, 2019 and the Pelican acquisition on February 12, 2019. Aquion offers a diverse line of water conditioners, water filters, drinking-water purifiers, ozone and ultraviolet disinfection systems, reverse osmosis systems and acid neutralizers for the residential and commercial water treatment industry. Pelican provides residential whole home water treatment systems.

CONSOLIDATED RESULTS OF OPERATIONS

The consolidated results of operations were as follows:

	Years ended December 31			% / point change	
In millions	**2018**	**2017**	**2016**	**2018 vs 2017**	**2017 vs 2016**
Net sales	$ 2,965.1	$ 2,845.7	$ 2,780.6	4.2 %	2.3 %
Cost of goods sold	1,917.4	1,858.2	1,821.5	3.2 %	2.0 %
Gross profit	1,047.7	987.5	959.1	6.1 %	3.0 %
% of net sales	*35.3%*	*34.7%*	*34.5%*	*0.6pts*	*0.2pts*
Selling, general and administrative	534.3	536.0	531.4	(0.3)%	0.9 %
% of net sales	*18.0%*	*18.8%*	*19.1%*	*(0.8pts)*	*(0.3pts)*
Research and development	76.7	73.2	73.3	4.8 %	(0.1)%
% of net sales	*2.6%*	*2.6%*	*2.6%*	—	—
Operating income	436.7	378.3	354.4	15.4 %	6.7 %
% of net sales	*14.7%*	*13.3%*	*12.7%*	*1.4pts*	*0.6pts*
Loss on sale of businesses	7.3	4.2	3.9	N.M.	7.7 %
Loss on early extinguishment of debt	17.1	101.4	—	N.M.	N.M
Net interest expense	32.6	87.3	140.1	(62.7)%	(37.7)%
Other (income) expense	(0.1)	12.6	(10.5)	N.M.	N.M
Income from continuing operations before income taxes	379.8	172.8	220.9	N.M.	(21.8)%
Provision for income taxes	58.1	58.7	42.7	(1.0)%	37.5%
Effective tax rate	*15.3%*	*34.0%*	*19.3%*	*(18.7pts)*	*14.7pts*

N.M. Not Meaningful

Net sales

The components of the consolidated net sales change were as follows:

	2018 vs 2017	**2017 vs 2016**
Volume	3.6 %	—%
Price	1.2	0.8
Core growth	4.8	0.8
Acquisition (divestiture)	(1.2)	1.1
Currency	0.6	0.4
Total	4.2 %	2.3%

The 4.2 percent increase in consolidated net sales in 2018 from 2017 was primarily the result of:

- core sales increases across all three reportable segments, primarily driven by increased sales in the residential and commercial businesses;
- selective increases in selling prices to mitigate inflationary cost increases; and
- favorable foreign currency effects during the year ended December 31, 2018.

This increase was partially offset by:

- sales declines due to the sale of certain businesses during the year ended December 31, 2018.

The 2.3 percent increase in consolidated net sales in 2017 from 2016 was primarily the result of:

- increased sales in our industrial and residential & commercial businesses primarily in the U.S.;
- selective increases in selling prices to mitigate inflationary cost increases;
- increased sales related to business acquisitions that occurred in the fourth quarter of 2016 and the first quarter of 2017; and
- favorable foreign currency effects during the year ended December 31, 2017 .

This increase was partially offset by:

- sales declines in our industrial business due to customer delays in capital spending; and
- large job adjustments to net sales of $9.7 million in 2017.

Gross profit

The 0.6 percentage point increase in gross profit as a percentage of sales in 2018 from 2017 was primarily the result of:

- selective increases in selling prices across all three reportable segments to mitigate inflationary cost increases;
- favorable mix in the Filtration Solutions segment; and
- higher contribution margin as a result of savings generated from our PIMS initiatives, including lean and supply management practices.

This increase was partially offset by:

- inflationary increases related to raw materials and labor costs.

The 0.2 percentage point increase in gross profit as a percentage of sales in 2017 from 2016 was primarily the result of:

- favorable material savings for certain raw materials and product mix offsetting inflation;
- selective increases in selling prices to mitigate inflationary cost increases; and
- higher contribution margin as a result of savings generated from our PIMS initiatives including lean and supply management practices.

This increase was partially offset by:

- inflationary increases related to raw materials and labor costs.

Selling, general and administrative ("SG&A")

The 0.8 percentage point decrease in SG&A expense as a percentage of sales in 2018 from 2017 and was driven by:

- savings generated from restructuring and other lean initiatives; and
- higher sales resulting in increased leverage.

This decrease was partially offset by:

- restructuring costs of $40.6 million in 2018 , compared to $28.2 million in 2017 ;
- the reversal of a $13.3 million indemnification liability in 2017 that did not recur in 2018; and
- investments in sales and marketing to drive growth.

The 0.3 percentage point decrease in SG&A expense as a percentage of sales in 2017 from 2016 and was driven by the following:

- a benefit from the reversal of a $13.3 million indemnification liability in 2017; and
- savings generated from back-office consolidation, reduction in personnel and other lean initiatives.

This decrease was partially offset by:

- restructuring costs of $28.2 million in 2017 , compared to $12.2 million in 2016 ;
- non-cash charges of $15.6 million in 2017 related to trade names and other impairments; and
- increased investments in sales and marketing to drive growth.

Net interest expense

The 62.7 percent decrease in net interest expense in 2018 from 2017 was primarily the result of:

- the impact of lower debt levels during 2018 compared to 2017 . In June 2018, the proceeds from the Separation were utilized to repay the remaining $255.3 million aggregate principal amount of our 2.9% fixed rate senior notes due 2018 and for the early extinguishment of €363.4 million aggregate principal amount of our 2.45% senior notes due 2019.

This decrease was partially offset by:

- increased overall interest rates in effect on our outstanding variable rate debt during 2018 compared to 2017 .

The 37.7 percent decrease in net interest expense in 2017 from 2016 was primarily the result of:

- the impact of lower debt levels during 2017 compared to 2016 . In May 2017, a portion of the proceeds from the sale of the Valves & Controls business was utilized to repay all commercial paper and revolving long term debt and for the early extinguishment of $1,659.3 million aggregate principal amount of certain series of fixed rate outstanding notes.

This decrease was partially offset by:

- increased overall interest rates in effect on our variable rate outstanding debt during 2017 compared to 2016 .

Loss on early extinguishment of debt

In June 2018, we redeemed the remaining $255.3 million aggregate principal amount of our 2.9% fixed rate senior notes due 2018 and completed a cash tender offer in the amount of €363.4 million aggregate principal amount of our 2.45% senior notes due 2019. All costs associated with the repurchases of debt were recorded as a *Loss on the early extinguishment of debt* , including $16.0 million premium paid on early extinguishment and $1.1 million of unamortized deferred financing costs.

In May 2017, we repurchased aggregate principal of certain series of outstanding fixed rate debt totaling $1,659.3 million. Total costs of $101.4 million associated with the repurchases were recorded as *Loss on early extinguishment of debt* .

Provision for income taxes

The 18.7 percentage point decrease in the effective tax rate in 2018 from 2017 was primarily due to:

- the mix of global earnings, including the impact of U.S. Tax Reform; and
- the impact of lower nondeductible interest expense allocated to continuing operations in 2018 compared to 2017.

The 14.7 percentage point increase in the effective tax rate in 2017 from 2016 was primarily due to:

- the mix of global earnings, including the impact of U.S. Tax Reform; and
- the unfavorable tax impact of restructuring costs in 2016 in jurisdictions with low tax benefits.

SEGMENT RESULTS OF OPERATIONS

This summary that follows provides a discussion of the results of operations of each of our three reportable segments (Aquatic Systems, Filtration Solutions and Flow Technologies). Each of these segments is comprised of various product offerings that serve multiple end markets.

We evaluate performance based on sales and segment income and use a variety of ratios to measure performance of our reporting segments. Segment income represents equity income of unconsolidated subsidiaries and operating income exclusive of intangible amortization, certain acquisition related expenses, costs of restructuring activities, impairments and other unusual non-operating items.

Aquatic Systems
The net sales and segment income for Aquatic Systems were as follows:

	Years ended December 31			% / point change	
In millions	**2018**	**2017**	**2016**	**2018 vs 2017**	**2017 vs 2016**
Net sales	$ 1,026.1	$ 939.6	$ 877.8	9.2%	7.0%
Segment income	277.6	254.1	217.4	9.2%	16.9%
% of net sales	*27.1%*	*27.0%*	*24.8%*	*0.1 pts*	*2.2 pts*

Net sales
The components of the change in Aquatic Systems net sales were as follows:

	2018 vs 2017	**2017 vs 2016**
Volume	8.2 %	5.2%
Price	2.3	1.4
Core growth	10.5	6.6
Acquisition (divestiture)	(1.2)	0.1
Currency	(0.1)	0.3
Total	9.2 %	7.0%

The 9.2 percent increase in net sales for Aquatic Systems in 2018 from 2017 was primarily the result of:

- core sales growth related to higher sales of certain pool products primarily serving North American residential housing; and
- selective increases in selling prices to mitigate inflationary cost increases.

This increase was partially offset by:

- sales declines due to the divestiture of certain businesses in 2018.

The 7.0 percent increase in net sales for Aquatic Systems in 2017 from 2016 was primarily the result of:

- core sales increases in the residential & commercial business primarily in the U.S.;
- selective increases in selling prices to mitigate inflationary cost increases; and
- favorable foreign currency effects.

Segment income
The components of the change in Aquatic Systems segment income from the prior period were as follows:

	2018	**2017**
Growth	1.4 pts	0.8 pts
Acquisition	0.4	0.4
Inflation	(2.9)	(1.1)
Productivity/Price	1.2	2.1
Total	0.1 pts	2.2 pts

The 0.1 point increase in segment income for Aquatic Systems as a percentage of net sales in 2018 from 2017 was primarily the result of:

- core sales growth contributions to income;
- selective increases in selling prices to mitigate inflationary cost increases; and
- cost savings generated from PIMS initiatives including lean and supply management practices.

This increase was partially offset by:

- inflationary increases related to raw material and labor costs.

The 2.2 point increase in segment income for Aquatic Systems as a percentage of net sales in 2017 from 2016 was primarily the result of:

- price increases to mitigate inflationary cost increases; and
- cost savings generated from PIMS initiatives including lean and supply management practices.

This increase was partially offset by:

- inflationary increases related to raw materials and labor costs.

Filtration Solutions

The net sales and segment income for Filtration Solutions were as follows:

	Years ended December 31			% / point change	
In millions	**2018**	**2017**	**2016**	**2018 vs 2017**	**2017 vs 2016**
Net sales	$ 1,001.0	$ 990.6	$ 976.3	1.0%	1.5%
Segment income	168.5	154.5	138.4	9.1%	11.6%
% of net sales	*16.8%*	*15.6%*	*14.2%*	*1.2 pts*	*1.4 pts*

Net sales

The components of the change in Filtration Solutions net sales were as follows:

	2018 vs 2017	2017 vs 2016
Volume	0.3 %	(2.8)%
Price	0.5	0.4
Core growth	0.8	(2.4)
Acquisition (divestiture)	(0.9)	2.9
Currency	1.1	1.0
Total	1.0 %	1.5 %

The 1.0 percent increase in net sales for Filtration Solutions in 2018 from 2017 was primarily the result of:

- increased sales volume in our commercial and industrial businesses;
- selective increases in selling prices to mitigate inflationary cost increases; and
- favorable foreign currency effects.

This increase was partially offset by:

- sales volume declines in our residential vertical; and
- sales declines due to the divestiture of certain businesses in 2018.

The 1.5 percent increase in net sales for Filtration Solutions in 2017 from 2016 was primarily the result of:

- increased sales related to a business acquisition that occurred in the first quarter of 2017;
- selective increases in selling prices to mitigate inflationary cost increases;
- sales increases in the U.S., China and Southeast Asia; and
- favorable foreign currency effects.

This increase was partially offset by:

- sales volume declines.

Segment income

The components of the change in Filtration Solutions segment income from the prior period were as follows:

	2018	2017
Growth	1.7 pts	(0.8) pts
Acquisition	0.1	(0.1)
Inflation	(2.5)	(1.6)
Productivity/Price	1.9	3.9
Total	1.2 pts	1.4 pts

The 1.2 point increase in segment income for Filtration Solutions as a percentage of net sales in 2018 from 2017 was primarily the result of:

- core growth contributions to income resulting in favorable mix;
- selective increases in selling prices to mitigate inflationary cost increases; and
- cost savings generated from PIMS initiatives including lean and supply management practices.

This increase was partially offset by:

- inflationary increases related to raw material and labor costs.

The 1.4 point increase in segment income for Filtration Solutions as a percentage of net sales in 2017 from 2016 was primarily the result of:

- selective increases in selling prices to mitigate inflation cost increases; and
- cost savings generated from back-office consolidation, reduction in personnel and other lean initiatives.

This increase was partially offset by:

- inflationary increases related to raw material and labor costs; and
- unfavorable mix due to volume declines year over year.

Flow Technologies

The net sales and segment income for Flow Technologies were as follows:

	Years ended December 31			% / point change	
In millions	2018	2017	2016	2018 vs 2017	2017 vs 2016
Net sales	$ 936.7	$ 914.2	$ 923.5	2.5%	(1.0)%
Segment income	145.6	140.6	141.6	3.6%	(0.7)%
% of net sales	*15.5%*	*15.4%*	*15.3%*	*0.1 pts*	*0.1pts*

Net sales
The components of the change in Flow Technologies net sales were as follows:

	2018 vs 2017	2017 vs 2016
Volume	2.3 %	(2.0)%
Price	0.9	0.5
Core growth	3.2	(1.5)
Acquisition (divestiture)	(1.3)	—
Currency	0.6	0.5
Total	2.5 %	(1.0)%

The 2.5 percent increase in Flow Technologies sales in 2018 from 2017 was primarily the result of:

- core growth in our commercial and specialty businesses;
- selective increases in selling prices to mitigate inflationary cost increases; and
- favorable foreign currency effects during 2018;

This increase was partially offset by:

- sales declines due to the divestiture of certain businesses.

The 1.0 percent decrease in Flow Technologies sales in 2017 from 2016 was primarily the result of:

- volume declines in our commercial business; and
- large job adjustments to net sales of $9.7 million in 2017.

This decrease was partially offset by:

- selective increases in selling prices to mitigate inflationary cost increases; and
- favorable foreign currency effects.

Segment income
The components of the change in Flow Technologies segment income from the prior period were as follows:

	2018	2017
Growth	0.8 pts	(1.1) pts
Acquisition (divestiture)	(0.1)	—
Inflation	(2.7)	(0.9)
Productivity/Price	2.1	2.1
Total	0.1 pts	0.1 pts

The 0.1 point increase in segment income for Flow Technologies as a percentage of net sales in 2018 from 2017 was primarily the result of:

- higher core sales in our commercial and specialty businesses, which resulted in increased leverage on fixed operating expenses;
- selective increases in selling prices to mitigate inflationary cost increases; and
- cost control and savings generated from lean initiatives.

This increase was partially offset by:

- inflationary increases related to raw material and labor costs.

The 0.1 point increase in segment income for Flow Technologies as a percentage of sales in 2017 from 2016 was primarily the result of:

- selective increases in selling prices to mitigate inflationary cost increases; and
- cost control and savings generated from back-office consolidation, reduction in personnel and other lean initiatives.

This increase was partially offset by:

- sales volume declines from our commercial business; and
- inflationary increases related to raw materials and labor costs.

LIQUIDITY AND CAPITAL RESOURCES

We generally fund cash requirements for working capital, capital expenditures, equity investments, acquisitions, debt repayments, dividend payments and share repurchases from cash generated from operations, availability under existing committed revolving credit facilities and in certain instances, public and private debt and equity offerings. Our primary revolving credit facilities have generally been adequate for these purposes, although we have negotiated additional credit facilities or completed debt and equity offerings as needed to allow us to complete acquisitions. We generally issue commercial paper to fund our financing needs on a short-term basis and use our revolving credit facility as back-up liquidity to support commercial paper.

We are focusing on increasing our cash flow and repaying existing debt, while continuing to fund our research and development, marketing and capital investment initiatives. Our intent is to maintain investment grade credit ratings and a solid liquidity position.

We experience seasonal cash flows primarily due to seasonal demand in a number of markets. We generally borrow in the first quarter of our fiscal year for operational purposes, which usage reverses in the second quarter as the seasonality of our businesses peaks. End-user demand for pool and certain pumping equipment follows warm weather trends and is at seasonal highs from April to August. The magnitude of the sales spike is partially mitigated by employing some advance sale “early buy” programs (generally including extended payment terms and/or additional discounts). Demand for residential and agricultural water systems is also impacted by weather patterns, particularly by heavy flooding and droughts.

Operating activities
Cash provided by operating activities of continuing operations was $458.1 million in 2018 , compared to $278.6 million in 2017 and $379.9 million in 2016 .

The $458.1 million in net cash provided by operating activities of continuing operations in 2018 primarily reflects net income from continuing operations of $423.4 million , net of non-cash depreciation and amortization and the loss on early extinguishment of debt, further increased by a positive impact of $30.2 million as a result of changes in net working capital.

The $278.6 million in net cash provided by operating activities of continuing operations in 2017 primarily reflects net income from continuing operations of $302.7 million , net of non-cash depreciation and amortization and the loss on early extinguishment of debt, partially offset by a negative impact of $87.3 million as a result of changes in net working capital.

The $379.9 million in net cash provided by operating activities of continuing operations in 2016 primarily reflects net income from continuing operations of $266.6 million , net of non-cash depreciation and amortization and a positive impact of $192.4 million as a result of changes in net working capital.

Investing activities
Cash used for investing activities of continuing operations was $61.7 million in 2018 , compared to $2,678.1 million of cash provided by investing activities of continuing operation in 2017 and $54.6 million of cash used for investing activities of continuing operations in 2016 .

Net cash used for investing activities of continuing operations in 2018 primarily reflects capital expenditures of $48.2 million and cash paid for the settlement of a working capital adjustment related to the sale of the Valves & Controls business.

Net cash provided by investing activities of continuing operations in 2017 primarily reflects the sale of the Valves & Controls business, partially offset by capital expenditures of $39.1 million and cash paid of $45.9 million to acquire a business as part of Filtration Solutions.

Net cash used for investing activities of continuing operations in 2016 primarily reflects capital expenditures of $43.3 million and cash paid of $25.0 million to acquire a business as part of Aquatic Systems.

Financing activities

Cash used for financing activities was $407.9 million in 2018 , compared to $3,432.6 million and $600.1 million in 2017 and 2016 , respectively.

As described below, in 2018 , we utilized $993.6 million of cash distributed from the Separation to repay commercial paper and revolving long-term debt and for the early extinguishment of certain series of fixed rate debt. Additionally, we repurchased $500.0 million of shares and made dividend payments of $187.2 million during 2018 .

In 2017 , net cash used for financing activities primarily relates to the utilization of proceeds from the sale of the Valves & Controls business to repay our commercial paper and revolving long-term debt and for the early extinguishment of certain series of fixed rate debt. Additionally, we repurchased $200.0 million of shares and made dividend payments of $251.7 million during 2017 .

In 2016, net cash used for financing activities was primarily due to net repayments of commercial paper and revolving long-term debt and payments of dividends of $243.6 million .

On April 25, 2018, Pentair, Pentair Investments Switzerland GmbH ("PISG"), Pentair Finance S.à r.l. ("PFSA") and Pentair, Inc. entered into a credit agreement, providing for a five -year $800.0 million senior unsecured revolving credit facility (the "Senior Credit Facility"), with Pentair and PISG as guarantors and PFSA and Pentair, Inc. as borrowers. The Senior Credit Facility replaced PFSA's existing credit facility under that certain Amended and Restated Credit Agreement, dated as of October 3, 2014. PFSA has the option to request to increase the Senior Credit Facility in an aggregate amount of up to $300.0 million , subject to customary conditions, including the commitment of the participating lenders. The Senior Credit Facility has a maturity date of April 25, 2023. Borrowings under the Senior Credit Facility bear interest at a rate equal to an adjusted base rate or the London Interbank Offered Rate, plus, in each case, an applicable margin. The applicable margin is based on, at PFSA's election, Pentair's leverage level or PFSA's public credit rating.

PFSA is authorized to sell short-term commercial paper notes to the extent availability exists under the Senior Credit Facility. PFSA uses the Senior Credit Facility as back-up liquidity to support 100% of commercial paper outstanding. PFSA had $76.0 million of commercial paper outstanding as of December 31, 2018 and $34.0 million as of December 31, 2017 , all of which was classified as long-term debt as we have the intent and the ability to refinance such obligations on a long-term basis under the Senior Credit Facility.

Our debt agreements contain various financial covenants, but the most restrictive covenants are contained in the Senior Credit Facility. The Senior Credit Facility contains covenants requiring us not to permit (i) the ratio of our consolidated debt (net of its consolidated unrestricted cash in excess of $5.0 million but not to exceed $250.0 million) to our consolidated net income (excluding, among other things, non-cash gains and losses) before interest, taxes, depreciation, amortization and non-cash share-based compensation expense ("EBITDA") on the last day of any period of four consecutive fiscal quarters to exceed 3.75 to 1.00 (the "Leverage Ratio") and (ii) the ratio of our EBITDA to our consolidated interest expense, for the same period to be less than 3.00 to 1.00 as of the end of each fiscal quarter. For purposes of the Leverage Ratio, the Senior Credit Facility provides for the calculation of EBITDA giving pro forma effect to certain acquisitions, divestitures and liquidations during the period to which such calculation relates. As of December 31, 2018 , we were in compliance with all financial covenants in our debt agreements.

Total availability under the Senior Credit Facility was $697.8 million as of December 31, 2018 .

In addition to the Senior Credit Facility, we have various other credit facilities with an aggregate availability of $21.1 million , of which there were no outstanding borrowings at December 31, 2018 . Borrowings under these credit facilities bear interest at variable rates.

In June 2018, we used the $993.6 million of cash received from nVent as a result of the Distribution to pay down commercial paper and revolving credit facilities, redeem the remaining $255.3 million aggregate principal of our 2.9% fixed rate senior notes due 2018, and complete a cash tender offer in the amount of €363.4 million aggregate principal of our 2.45% senior notes due 2019. All costs associated with the repurchases of debt were recorded as a *Loss on early extinguishment of debt* in the Consolidated Statements of Operations and Comprehensive Income , including $16.0 million premium paid on early extinguishment and $1.1 million of unamortized deferred financing costs.

As of December 31, 2018 , we had $48.8 million of cash held in certain countries in which the ability to repatriate is limited due to local regulations or significant potential tax consequences.

We expect to continue to have cash requirements to support working capital needs and capital expenditures, to pay interest and service debt and to pay dividends to shareholders quarterly. We believe we have the ability and sufficient capacity to meet these cash requirements by using available cash and internally generated funds and to borrow under our committed and uncommitted credit facilities.

Authorized shares
Our authorized share capital consists of 426.0 million ordinary shares with a par value of $0.01 per share.

Share repurchases
In December 2014, the Board of Directors authorized the repurchase of our ordinary shares up to a maximum dollar limit of $1.0 billion (the "2014 Authorization"). On May 8, 2018, the Board of Directors authorized the repurchase of our ordinary shares up to a maximum dollar limit of $750.0 million (the "2018 Authorization"), replacing the 2014 Authorization. The 2018 Authorization expires on May 31, 2021 .

During the year ended December 31, 2017 , we repurchased 3.0 million of our ordinary shares for $200.0 million under the 2014 Authorization.

During the year ended December 31, 2018 , we repurchased 10.2 million of our shares for $500.0 million , of which 2.2 million shares, or $150.0 million , and 8.0 million shares, or $350.0 million , were repurchased pursuant to the 2014 and 2018 Authorizations, respectively.

As of December 31, 2018 , we had $400.0 million available for share repurchases under the 2018 Authorization.

Dividends
On December 10, 2018, the Board of Directors declared a quarterly cash dividend of $0.18 that was paid on February 8, 2019 to shareholders of record at the close of business on January 25, 2019. Additionally, the Board of Directors approved a plan to increase the 2019 annual cash dividend to $0.72 from $0.70 , adjusted for the Separation. The 2019 dividend is intended to be paid in four quarterly installments. As a result, the balance of dividends payable included in *Other current liabilities* on our Consolidated Balance Sheets was $30.8 million at December 31, 2018 . Dividends paid per ordinary share were $1.05 , $1.38 and $1.34 for the years ended December 31, 2018 , 2017 and 2016 , respectively.

Under Irish law, the payment of future cash dividends and repurchases of shares may be paid only out of Pentair plc's "distributable reserves" on its statutory balance sheet. Pentair plc is not permitted to pay dividends out of share capital, which includes share premiums. Distributable reserves may be created through the earnings of the Irish parent company and through a reduction in share capital approved by the Irish High Court. Distributable reserves are not linked to a GAAP reported amount (e.g., retained earnings). Our distributable reserve balance was $6.5 billion and $9.0 billion as of December 31, 2018 and 2017 , respectively.

Contractual obligations
The following summarizes our significant contractual obligations that impact our liquidity:

	Years ended December 31						
In millions	**2019**	**2020**	**2021**	**2022**	**2023**	**Thereafter**	**Total**
Debt obligations	$ 405.1	$ 74.0	$ 103.8	$ 88.3	$ 102.1	$ 19.4	$ 792.7
Interest obligations on fixed-rate debt	21.9	11.5	6.3	3.7	0.9	1.8	46.1
Operating lease obligations, net of sublease rentals	22.5	17.0	12.7	10.5	8.9	13.2	84.8
Purchase and marketing obligations	20.6	4.6	3.0	3.2	2.4	4.8	38.6
Pension and other post-retirement plan contributions	31.6	8.8	8.7	8.7	8.2	41.6	107.6
Total contractual obligations, net	$ 501.7	$ 115.9	$ 134.5	$ 114.4	$ 122.5	$ 80.8	$ 1,069.8

The majority of the purchase obligations represent commitments for raw materials to be utilized in the normal course of business. For purposes of the above table, arrangements are considered purchase obligations if a contract specifies all significant terms, including fixed or minimum quantities to be purchased, a pricing structure and approximate timing of the transaction.

In addition to the summary of significant contractual obligations, we will incur annual interest expense on outstanding variable rate debt. As of December 31, 2018 , variable interest rate debt was $102.2 million at a weighted average interest rate of 3.36% .

The total gross liability for uncertain tax positions at December 31, 2018 was estimated to be $51.4 million . We record penalties and interest related to unrecognized tax benefits in *Provision for income taxes* and *Interest expense* , respectively, which is consistent with our past practices. As of December 31, 2018 , we had recorded $0.5 million for the possible payment of penalties and $3.6 million related to the possible payment of interest.

Other financial measures
In addition to measuring our cash flow generation or usage based upon operating, investing and financing classifications included in the Consolidated Statements of Cash Flows, we also measure our free cash flow. We have a long-term goal to consistently generate free cash flow that equals or exceeds 100 percent conversion of adjusted net income. Free cash flow is a non-GAAP financial measure that we use to assess our cash flow performance. We believe free cash flow is an important measure of liquidity because it provides us and our investors a measurement of cash generated from operations that is available to pay dividends, make acquisitions, repay debt and repurchase shares. In addition, free cash flow is used as a criterion to measure and pay compensation-based incentives. Our measure of free cash flow may not be comparable to similarly titled measures reported by other companies.

The following table is a reconciliation of free cash flow:

	Years ended December 31		
In millions	**2018**	**2017**	**2016**
Net cash provided by operating activities of continuing operations	$ 458.1	$ 278.6	$ 379.9
Capital expenditures of continuing operations	(48.2)	(39.1)	(43.3)
Proceeds from sale of property and equipment of continuing operations	0.2	3.7	18.8
Free cash flow from continuing operations	$ 410.1	$ 243.2	$ 355.4
Net cash provided by (used for) operating activities of discontinued operations	(19.0)	341.6	481.5
Capital expenditures of discontinued operations	(7.4)	(38.6)	(94.9)
Proceeds from sale of property and equipment of discontinued operations	2.3	4.5	27.8
Free cash flow	$ 386.0	$ 550.7	$ 769.8

Off-balance sheet arrangements
At December 31, 2018 , we had no off-balance sheet financing arrangements.

COMMITMENTS AND CONTINGENCIES

We have been, and in the future may be, made parties to a number of actions filed or have been, and in the future may be, given notice of potential claims relating to the conduct of our business, including those relating to commercial or contractual disputes with suppliers, customers or parties to acquisitions and divestitures, intellectual property matters, environmental, safety and health matters, product liability, the use or installation of our products, consumer matters, and employment and labor matters.

While we believe that a material impact on our consolidated financial position, results of operations or cash flows from any such future claims or potential claims is unlikely, given the inherent uncertainty of litigation, a remote possibility exists that a future adverse ruling or unfavorable development could result in future charges that could have a material impact. We do and will continue to periodically reexamine our estimates of probable liabilities and any associated expenses and receivables and make appropriate adjustments to such estimates based on experience and developments in litigation. As a result, the current estimates of the potential impact on our consolidated financial position, results of operations and cash flows for the proceedings and claims described in ITEM 8, Note 15 of the Notes to Consolidated Financial Statements could change in the future.

Product liability claims
We are subject to various product liability lawsuits and personal injury claims. A substantial number of these lawsuits and claims are insured and accrued for by Penwald, our captive insurance subsidiary. See discussion in ITEM 1 and ITEM 8, Note 1 of the Notes to Consolidated Financial Statements — Insurance subsidiary. Penwald records a liability for these claims based on actuarial projections of ultimate losses. For all other claims, accruals covering the claims are recorded, on an undiscounted basis, when it is probable that a liability has been incurred and the amount of the liability can be reasonably estimated based on existing information. The accruals are adjusted periodically as additional information becomes available. We have not experienced significant unfavorable trends in either the severity or frequency of product liability lawsuits or personal injury claims.

Stand-by letters of credit, bank guarantees and bonds
In certain situations, Tyco International Ltd., Pentair Ltd.'s former parent company ("Tyco"), guaranteed performance by the flow control business of Pentair Ltd. ("Flow Control") to third parties or provided financial guarantees for financial commitments of Flow Control. In situations where Flow Control and Tyco were unable to obtain a release from these guarantees in connection with the spin-off of Flow Control from Tyco, we will indemnify Tyco for any losses it suffers as a result of such guarantees.

In disposing of assets or businesses, we often provide representations, warranties and indemnities to cover various risks including unknown damage to the assets, environmental risks involved in the sale of real estate, liability to investigate and remediate environmental contamination at waste disposal sites and manufacturing facilities and unidentified tax liabilities and legal fees related to periods prior to disposition. We do not have the ability to reasonably estimate the potential liability due to the inchoate and unknown nature of these potential liabilities. However, we have no reason to believe that these uncertainties would have a material adverse effect on our financial position, results of operations or cash flows.

In the ordinary course of business, we are required to commit to bonds, letters of credit and bank guarantees that require payments to our customers for any non-performance. The outstanding face value of these instruments fluctuates with the value of our projects in process and in our backlog. In addition, we issue financial stand-by letters of credit primarily to secure our performance to third parties under self-insurance programs.

As of December 31, 2018 and 2017 , the outstanding value of bonds, letters of credit and bank guarantees totaled $123.6 million and $129.2 million , respectively.

NEW ACCOUNTING STANDARDS

See ITEM 8, Note 1 of the Notes to Consolidated Financial Statements, included in this Form 10-K, for information pertaining to recently adopted accounting standards or accounting standards to be adopted in the future.

CRITICAL ACCOUNTING POLICIES

We have adopted various accounting policies to prepare the consolidated financial statements in accordance with GAAP. Our significant accounting policies are more fully described in ITEM 8, Note 1 of the Notes to Consolidated Financial Statements. Certain accounting policies require the application of significant judgment by management in selecting the appropriate assumptions for calculating financial estimates. By their nature, these judgments are subject to an inherent degree of uncertainty. These judgments are based on our historical experience, terms of existing contracts, our observance of trends in the industry and information available from other outside sources, as appropriate. We consider an accounting estimate to be critical if:

- it requires us to make assumptions about matters that were uncertain at the time we were making the estimate; and
- changes in the estimate or different estimates that we could have selected would have had a material impact on our financial condition or results of operations.

Our critical accounting estimates include the following:

Impairment of goodwill and indefinite-lived intangibles
Goodwill
Goodwill represents the excess of the cost of acquired businesses over the net of the fair value of identifiable tangible net assets and identifiable intangible assets purchased and liabilities assumed.

Goodwill is tested at least annually for impairment and is tested for impairment more frequently if events or changes in circumstances indicate that the asset might be impaired. We complete our annual goodwill impairment evaluation as of the first day of the fourth quarter. We last performed a two-step assessment of goodwill impairment as of October 1, 2017, referred to as a "step 1" approach. In the first step of the step 1 approach, the fair value of each reporting unit is compared with the carrying amount of the reporting unit, including goodwill. If the estimated fair value is less than the carrying amount of the reporting unit there is an indication that goodwill impairment exists and a second step must be completed in order to determine the amount of the goodwill impairment, if any, that should be recorded. In the second step of the step 1 approach, an impairment loss is recognized for any excess of the carrying amount of the reporting unit's goodwill over the implied fair value of that goodwill. The implied fair value of goodwill is determined by allocating the fair value of the reporting unit in a manner similar to a purchase price allocation.

The fair value of each reporting unit is determined using a discounted cash flow analysis and market approach. Projecting discounted future cash flows requires us to make significant estimates regarding future revenues and expenses, projected capital expenditures, changes in working capital and the appropriate discount rate. Use of the market approach consists of comparisons to comparable publicly-traded companies that are similar in size and industry. Actual results may differ from those used in our valuations. In developing our discounted cash flow analysis, assumptions about future revenues and expenses, capital expenditures and changes in working capital, are based on our annual operating plan and long-term business plan for each of our reporting units. These plans take into consideration numerous factors including historical experience, anticipated future economic conditions, changes in raw material prices and growth expectations for the industries and end markets we participate in. These assumptions are determined over a six year long-term planning period. The six year growth rates for revenues and operating profits vary for each reporting unit being evaluated.

Discount rate assumptions for each reporting unit take into consideration our assessment of risks inherent in the future cash flows of the respective reporting unit and our weighted-average cost of capital.

In estimating fair value using the market approach, we identify a group of comparable publicly-traded companies for each reporting unit that are similar in terms of size and product offering. These groups of comparable companies are used to develop multiples based on total market-based invested capital as a multiple of EBITDA. We determine our estimated values by applying these comparable EBITDA multiples to the operating results of our reporting units. The ultimate fair value of each reporting unit is determined considering the results of both valuation methods.

As of October 1, 2018, we performed a qualitative assessment, referred to as a “step 0” approach, and determined that it was more likely than not that the fair value of the reporting units exceeded their respective carrying amounts. As a result, the Company is not required to proceed to a “step 1” impairment assessment. Factors considered included the 2017 “step 1” analysis and the calculated excess fair value over carrying amount, financial performance, forecasts and trends, market capitalization, regulatory and environmental issues, macro-economic conditions, industry and market considerations, raw material and labor costs and management stability. We consider the extent to which each of the adverse events and circumstances identified affect the comparison of the respective reporting unit’s fair value with its carrying amount. We place more weight on the events and circumstances that most affect the respective reporting unit’s fair value or the carrying amount of its net assets. We consider positive and mitigating events and circumstances that may affect its determination of whether it is more likely than not that the fair value exceeds the carrying amount.

We completed our annual goodwill impairment evaluation as of the first day of the fourth quarter of 2018, 2017 and 2016 with no indications of impairment.

Identifiable intangible assets

Our primary identifiable intangible assets include: customer relationships, trade names, proprietary technology and patents. Identifiable intangibles with finite lives are amortized and those identifiable intangibles with indefinite lives are not amortized. Identifiable intangible assets that are subject to amortization are evaluated for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. Identifiable intangible assets not subject to amortization are tested for impairment annually or more frequently if events warrant. We complete our annual impairment test during the fourth quarter each year for those identifiable assets not subject to amortization.

The impairment test for trade names consists of a comparison of the fair value of the trade name with its carrying value. Fair value is measured using the relief-from-royalty method. This method assumes the trade name has value to the extent that the owner is relieved of the obligation to pay royalties for the benefits received from them. This method requires us to estimate the future revenue for the related brands, the appropriate royalty rate and the weighted average cost of capital. The non-recurring fair value measurement is a “Level 3” measurement under the fair value hierarchy.

There were no impairment charges recorded in 2018 for identifiable intangible assets.

An impairment charge of $8.8 million was recorded in 2017 related to certain trade names in Filtration Solutions and Flow Technologies as a result of lower forecasted sales volume or rebranding strategies implemented in the fourth quarter of 2017. The trade name impairment charges were recorded in *Selling, general and administrative* in our Consolidated Statements of Operations and Comprehensive Income.

There were no impairment charges recorded in 2016 for identifiable intangible assets.

Pension and other post-retirement plans
We sponsor U.S. and non-U.S. defined-benefit pension and other post-retirement plans. The amounts recognized in our consolidated financial statements related to our defined-benefit pension and other post-retirement plans are determined from actuarial valuations. Inherent in these valuations are assumptions, including: expected return on plan assets, discount rates, rate of increase in future compensation levels and health care cost trend rates. These assumptions are updated annually and are disclosed in ITEM 8, Note 11 to the Notes to Consolidated Financial Statements. Differences in actual experience or changes in assumptions may affect our pension and other post-retirement obligations and future expense.

We recognize changes in the fair value of plan assets and net actuarial gains or losses for pension and other post-retirement benefits annually in the fourth quarter each year ("mark-to-market adjustment") and, if applicable, in any quarter in which an interim remeasurement is triggered. Net actuarial gains and losses occur when the actual experience differs from any of the various assumptions used to value our pension and other post-retirement plans or when assumptions change as they may each year. The primary factors contributing to actuarial gains and losses each year are (1) changes in the discount rate used to value pension and other post-retirement benefit obligations as of the measurement date and (2) differences between the expected and the actual return on plan assets. This accounting method also results in the potential for volatile and difficult to forecast mark-to-market adjustments. Mark-to-market adjustments resulted in pre-tax charges of $3.6 million and $8.5 million in 2018 and 2017 , respectively, and pre-tax income of $12.0 million in 2016 . The remaining components of pension expense, including service and interest costs and the expected return on plan assets, are recorded on a quarterly basis as ongoing pension expense.

Discount rates
The discount rate reflects the current rate at which the pension liabilities could be effectively settled at the end of the year based on our December 31 measurement date. The discount rate was determined by matching our expected benefit payments to payments from a stream of bonds rated AA or higher available in the marketplace, adjusted to eliminate the effects of call provisions. There are no known or anticipated changes in our discount rate assumptions that will impact our pension expense in 2019 .

Expected rate of return
The expected rate of return is designed to be a long-term assumption that may be subject to considerable year-to-year variance from actual returns. In developing the expected long-term rate of return, we considered our historical returns, with consideration given to forecasted economic conditions, our asset allocations, input from external consultants and broader long-term market indices.

Loss contingencies
Accruals are recorded for various contingencies including legal proceedings, self-insurance and other claims that arise in the normal course of business. The accruals are based on judgment, the probability of losses and, where applicable, the consideration of opinions of internal and/or external legal counsel and actuarially determined estimates. Additionally, we record receivables from third party insurers when recovery has been determined to be probable.

Income taxes
In determining taxable income for financial statement purposes, we must make certain estimates and judgments. These estimates and judgments affect the calculation of certain tax liabilities and the determination of the recoverability of certain of the deferred tax assets, which arise from temporary differences between the tax and financial statement recognition of revenue and expense. In evaluating our ability to recover our deferred tax assets we consider all available positive and negative evidence including our past operating results, the existence of cumulative losses in the most recent years and our forecast of future taxable income. In estimating future taxable income, we develop assumptions including the amount of future pre-tax operating income, the reversal of temporary differences and the implementation of feasible and prudent tax planning strategies. These assumptions require significant judgment about the forecasts of future taxable income and are consistent with the plans and estimates we are using to manage the underlying businesses.

We currently have recorded valuation allowances that we will maintain until when, in the opinion of management, it is more likely than not that some portion or all of the deferred tax assets will be realized. Our income tax expense recorded in the future may be reduced to the extent of decreases in our valuation allowances. The realization of our remaining deferred tax assets is primarily dependent on future taxable income in the appropriate jurisdiction. Any reduction in future taxable income including but not limited to any future restructuring activities may require that we record an additional valuation allowance against our deferred tax assets. An increase in the valuation allowance could result in additional income tax expense in such period and could have a significant impact on our future earnings.

Changes in tax laws and rates could also affect recorded deferred tax assets and liabilities in the future. Management records the effect of a tax rate or law change on the Company's deferred tax assets and liabilities in the period of enactment. Future tax rate or law changes could have a material effect on the Company's financial condition, results of operations or cash flows.

In addition, the calculation of our tax liabilities involves dealing with uncertainties in the application of complex tax regulations in a multitude of jurisdictions across our global operations. We perform reviews of our income tax positions on a quarterly basis and accrue for uncertain tax positions. We recognize potential liabilities and record tax liabilities for anticipated tax audit issues in the tax jurisdictions in which we operate based on our estimate of whether, and the extent to which, additional taxes will be due. These tax liabilities are reflected net of related tax loss carryforwards. As events change or resolution occurs, these liabilities are adjusted, such as in the case of audit settlements with taxing authorities. The ultimate resolution may result in a payment that is materially different from our current estimate of the tax liabilities. If our estimate of tax liabilities proves to be less than the ultimate assessment, an additional charge to expense would result. If payment of these amounts ultimately proves to be less than the recorded amounts, the reversal of the liabilities would result in tax benefits being recognized in the period when we determine the liabilities are no longer necessary.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Market risk is the potential economic loss that may result from adverse changes in the fair value of financial instruments. We are exposed to various market risks, including changes in interest rates and foreign currency rates. Periodically, we use derivative financial instruments to manage or reduce the impact of changes in interest rates and foreign currency rates. Counterparties to all derivative contracts are major financial institutions. All instruments are entered into for other than trading purposes. The major accounting policies and utilization of these instruments is described more fully in ITEM 8, Note 1 of the Notes to Consolidated Financial Statements.

Interest rate risk

Our debt portfolio as of December 31, 2018 , was comprised of debt predominantly denominated in U.S. dollars. This debt portfolio is comprised of 88% fixed-rate debt and 12% variable-rate debt. Changes in interest rates have different impacts on the fixed and variable-rate portions of our debt portfolio. A change in interest rates on the fixed portion of the debt portfolio impacts the fair value, but has no impact on interest incurred or cash flows. A change in interest rates on the variable portion of the debt portfolio impacts the interest incurred and cash flows but does not impact the net financial instrument position.

Based on the fixed-rate debt included in our debt portfolio, as of December 31, 2018 , a 100 basis point increase or decrease in interest rates would result in an $11.6 million decrease or a $12.0 million increase in fair value, respectively.

Based on the variable-rate debt included in our debt portfolio as of December 31, 2018 , a 100 basis point increase or decrease in interest rates would result in a $1.0 million increase or decrease in interest incurred.

Foreign currency risk

We conduct business in various locations throughout the world and are subject to market risk due to changes in the value of foreign currencies in relation to our reporting currency, the U.S. dollar. Periodically, we use derivative financial instruments to manage these risks. The functional currencies of our foreign operating locations are generally the local currency in the country of domicile. We manage these operating activities at the local level and revenues, costs, assets and liabilities are generally denominated in local currencies, thereby mitigating the risk associated with changes in foreign exchange. However, our results of operations and assets and liabilities are reported in U.S. dollars and thus will fluctuate with changes in exchange rates between such local currencies and the U.S. dollar.

From time to time, we may enter into short duration foreign currency contracts to hedge foreign currency risks. As the majority of our foreign currency contracts have an original maturity date of less than one year, there is no material foreign currency risk. At December 31, 2018 and 2017 , we had outstanding foreign currency derivative contracts with gross notional U.S. dollar equivalent amounts of $331.4 million and $481.4 million , respectively. Changes in the fair value of all derivatives are recognized immediately in income unless the derivative qualifies as a hedge of future cash flows. Gains and losses related to a hedge are deferred and recorded in the Consolidated Balance Sheets as a component of *Accumulated other comprehensive loss* and subsequently recognized in the Consolidated Statements of Operations and Comprehensive Income when the hedged item affects earnings.

At December 31, 2018, we had €136.6 million 2.45% Senior Notes due 2019 (the “2019 Euro Notes”) designated as a net investment hedge of our investments in certain international subsidiaries that use the Euro as their functional currency. The hedge is intended to reduce, but will not eliminate, the impact on our financial results of changes in the exchange rate between the Euro and the U.S. dollar. The currency risk related to the net investment hedge is measured by estimating the potential impact of a 10% change in the value of the U.S. dollar relative to the Euro. The rates used to perform this analysis were based on the market exchange rates in effect on December 31, 2018 . A 10% appreciation of the U.S. dollar relative to the Euro would result in a $14.1 million net increase in *Accumulated other comprehensive loss* . Conversely, a 10% depreciation of the U.S. dollar relative to the Euro would result in a $17.2 million net decrease in *Accumulated other comprehensive loss* . However,

these increases and decreases in Other comprehensive income would be offset by decreases or increases in the hedged net investments on our balance sheet due to currency translation.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Management of Pentair plc and its subsidiaries (the "Company") is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15d-15(f) of the Securities Exchange Act of 1934. The Company's internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. The Company's internal control over financial reporting includes those policies and procedures that (1) pertain to maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of the financial statements in accordance with generally accepted accounting principles and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and directors of the Company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on the financial statements.

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

Management assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2018 . In making this assessment, management used the criteria for effective internal control over financial reporting described in *Internal Control-Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this assessment, management believes that, as of December 31, 2018 , the Company's internal control over financial reporting was effective based on those criteria.

Our independent registered public accounting firm, Deloitte & Touche LLP, has issued an attestation report on the Company's internal control over financial reporting as of December 31, 2018 . That attestation report is set forth immediately following this management report.

John L. Stauch	Mark C. Borin
President and Chief Executive Officer	*Executive Vice President and Chief Financial Officer*

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of
Pentair plc
London, United Kingdom

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Pentair plc and subsidiaries (the "Company") as of December 31, 2018 , based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018 , based on the criteria established in *Internal Control - Integrated Framework (2013)* issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements and financial statement schedule listed in the Index at Item 15 as of and for the year ended December 31, 2018 , of the Company and our report dated February 19, 2019 expressed an unqualified opinion on those financial statements and financial statement schedule.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ Deloitte & Touche LLP

Minneapolis, Minnesota
February 19, 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of
Pentair plc
London, United Kingdom

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Pentair plc and subsidiaries (the "Company") as of December 31, 2018 and 2017 , the related Consolidated Statements of Operations and Comprehensive Income, Changes in Equity, and Cash Flows for each of the three years in the period ended December 31, 2018 , the related notes, and the schedule listed in the Index at Item 15 (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017 , and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control-Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated February 19, 2019 expressed an unqualified opinion on the Company's internal control over financial reporting.

Basis for Opinion

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

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

/s/ Deloitte & Touche LLP

Minneapolis, Minnesota
February 19, 2019

We have served as the Company's auditor since 1977.

Pentair plc and Subsidiaries
Consolidated Statements of Operations and Comprehensive Income

In millions, except per-share data	Years ended December 31 2018	2017	2016
Net sales	$ 2,965.1	$ 2,845.7	$ 2,780.6
Cost of goods sold	1,917.4	1,858.2	1,821.5
Gross profit	1,047.7	987.5	959.1
Selling, general and administrative	534.3	536.0	531.4
Research and development	76.7	73.2	73.3
Operating income	436.7	378.3	354.4
Other (income) expense			
Loss on sale of businesses	7.3	4.2	3.9
Loss on early extinguishment of debt	17.1	101.4	—
Net interest expense	32.6	87.3	140.1
Other (income) expense	(0.1)	12.6	(10.5)
Income from continuing operations before income taxes	379.8	172.8	220.9
Provision for income taxes	58.1	58.7	42.7
Net income from continuing operations	321.7	114.1	178.2
Income from discontinued operations, net of tax	25.7	371.3	343.4
Gain from sale / impairment of discontinued operations, net of tax	—	181.1	0.6
Net income	$ 347.4	$ 666.5	$ 522.2
Comprehensive income, net of tax			
Net income	$ 347.4	$ 666.5	$ 522.2
Changes in cumulative translation adjustment (inclusive of divestiture of business reclassified to gain from sale of $374.2 for the year ended December 31, 2017)	10.0	497.5	(83.0)
Changes in market value of derivative financial instruments, net of tax	4.8	(4.6)	(8.3)
Comprehensive income	$ 362.2	$ 1,159.4	$ 430.9
Earnings per ordinary share			
Basic			
Continuing operations	$ 1.83	$ 0.63	$ 0.98
Discontinued operations	0.15	3.04	1.90
Basic earnings per ordinary share	$ 1.98	$ 3.67	$ 2.88
Diluted			
Continuing operations	$ 1.81	$ 0.62	$ 0.97
Discontinued operations	0.15	3.01	1.88
Diluted earnings per ordinary share	$ 1.96	$ 3.63	$ 2.85
Weighted average ordinary shares outstanding			
Basic	175.8	181.7	181.3
Diluted	177.3	183.7	183.1

See accompanying notes to consolidated financial statements.

Pentair plc and Subsidiaries
Consolidated Balance Sheets

In millions, except per-share data	December 31 2018	2017
Assets		
Current assets		
Cash and cash equivalents	$ 74.3	$ 86.3
Accounts receivable, net of allowances of $14.0 and $14.2, respectively	488.2	483.1
Inventories	387.5	356.9
Other current assets	89.4	114.5
Current assets held for sale	—	708.0
Total current assets	1,039.4	1,748.8
Property, plant and equipment, net	272.6	279.8
Other assets		
Goodwill	2,072.7	2,112.8
Intangibles, net	276.3	321.8
Other non-current assets	145.5	180.9
Non-current assets held for sale	—	3,989.6
Total other assets	2,494.5	6,605.1
Total assets	$ 3,806.5	$ 8,633.7
Liabilities and Equity		
Current liabilities		
Accounts payable	$ 378.6	$ 321.5
Employee compensation and benefits	111.7	115.8
Other current liabilities	328.4	401.3
Current liabilities held for sale	—	360.8
Total current liabilities	818.7	1,199.4
Other liabilities		
Long-term debt	787.6	1,440.7
Pension and other post-retirement compensation and benefits	90.0	96.4
Deferred tax liabilities	105.9	108.6
Other non-current liabilities	168.2	213.8
Non-current liabilities held for sale	—	537.0
Total liabilities	1,970.4	3,595.9
Equity		
Ordinary shares $0.01 par value, 426.0 authorized, 171.4 and 180.3 issued at December 31, 2018 and December 31, 2017, respectively	1.7	1.8
Additional paid-in capital	1,893.8	2,797.7
Retained earnings	169.2	2,481.7
Accumulated other comprehensive loss	(228.6)	(243.4)
Total equity	1,836.1	5,037.8
Total liabilities and equity	$ 3,806.5	$ 8,633.7

See accompanying notes to consolidated financial statements.

Pentair plc and Subsidiaries
Consolidated Statements of Cash Flows

In millions	Years ended December 31 2018	2017	2016
Operating activities			
Net income	$ 347.4	$ 666.5	$ 522.2
Income from discontinued operations, net of tax	(25.7)	(371.3)	(343.4)
Gain from sale / impairment of discontinued operations, net of tax	—	(181.1)	(0.6)
Adjustments to reconcile net income from continuing operations to net cash provided by operating activities of continuing operations			
Equity income of unconsolidated subsidiaries	(8.4)	(1.3)	(4.3)
Depreciation	49.7	50.8	53.0
Amortization	34.9	36.4	35.4
Loss on sale of businesses	7.3	4.2	3.9
Deferred income taxes	(4.1)	(18.0)	1.2
Share-based compensation	20.9	39.6	34.2
Trade name and other impairment	12.0	15.6	—
Loss on early extinguishment of debt	17.1	101.4	—
Excess tax benefits from share-based compensation	—	—	(8.0)
Changes in assets and liabilities, net of effects of business acquisitions			
Accounts receivable	(15.3)	(13.4)	16.6
Inventories	(40.1)	(20.5)	33.9
Other current assets	31.2	(13.0)	2.1
Accounts payable	58.3	15.6	22.8
Employee compensation and benefits	(0.6)	(1.4)	26.7
Other current liabilities	(3.3)	(54.6)	90.3
Other non-current assets and liabilities	(23.2)	23.1	(106.1)
Net cash provided by operating activities of continuing operations	458.1	278.6	379.9
Net cash provided by (used for) operating activities of discontinued operations	(19.0)	341.6	481.5
Net cash provided by operating activities	439.1	620.2	861.4
Investing activities			
Capital expenditures	(48.2)	(39.1)	(43.3)
Proceeds from sale of property and equipment	0.2	3.7	18.8
(Payments due to) proceeds from sale of businesses and other	(12.8)	2,759.4	(5.1)
Acquisitions, net of cash acquired	(0.9)	(45.9)	(25.0)
Net cash provided by (used for) investing activities of continuing operations	(61.7)	2,678.1	(54.6)
Net cash used for investing activities of discontinued operations	(7.1)	(47.7)	(67.2)
Net cash provided by (used for) investing activities	(68.8)	2,630.4	(121.8)
Financing activities			
Net receipts (repayments) of commercial paper and revolving long-term debt	39.7	(913.1)	(385.3)
Repayment of long-term debt	(675.1)	(2,009.3)	(0.7)
Premium paid on early extinguishment of debt	(16.0)	(94.9)	—
Transfer of cash to nVent	(74.2)	—	—
Distribution of cash from nVent	993.6	—	—
Shares issued to employees, net of shares withheld	13.3	37.2	20.7
Repurchases of ordinary shares	(500.0)	(200.0)	—
Dividends paid	(187.2)	(251.7)	(243.6)
Other	(2.0)	(0.8)	8.8
Net cash used for financing activities	(407.9)	(3,432.6)	(600.1)
Change in cash held for sale	27.0	(5.4)	1.1
Effect of exchange rate changes on cash and cash equivalents	(1.4)	56.8	(27.3)
Change in cash and cash equivalents	(12.0)	(130.6)	113.3
Cash and cash equivalents, beginning of year	86.3	216.9	103.6
Cash and cash equivalents, end of year	$ 74.3	$ 86.3	$ 216.9
Supplemental disclosure of cash flow information:			
Cash paid for interest, net	$ 43.7	$ 107.2	$ 143.4
Cash paid for income taxes, net	92.9	362.1	145.1

See accompanying notes to consolidated financial statements.

Pentair plc and Subsidiaries
Consolidated Statements of Changes in Equity

In millions	Ordinary shares Number	Ordinary shares Amount	Additional paid-in capital	Retained earnings	Accumulated other comprehensive income (loss)	Total
Balance - December 31, 2015	180.5	$ 1.8	$ 2,860.3	$ 1,791.7	$ (645.0)	$ 4,008.8
Net income	—	—	—	522.2	—	522.2
Other comprehensive loss, net of tax	—	—	—	—	(91.3)	(91.3)
Tax benefit of share-based compensation	—	—	5.5	—	—	5.5
Dividends declared	—	—	—	(245.8)	—	(245.8)
Exercise of options, net of shares tendered for payment	1.0	—	31.6	—	—	31.6
Issuance of restricted shares, net of cancellations	0.5	—	—	—	—	—
Shares surrendered by employees to pay taxes	(0.2)	—	(10.8)	—	—	(10.8)
Share-based compensation	—	—	34.2	—	—	34.2
Balance - December 31, 2016	181.8	$ 1.8	$ 2,920.8	$ 2,068.1	$ (736.3)	$ 4,254.4
Net income	—	—	—	666.5	—	666.5
Other comprehensive income, net of tax	—	—	—	—	492.9	492.9
Dividends declared	—	—	—	(252.9)	—	(252.9)
Share repurchase	(3.0)	—	(200.0)	—	—	(200.0)
Exercise of options, net of shares tendered for payment	1.2	—	45.6	—	—	45.6
Issuance of restricted shares, net of cancellations	0.4	—	—	—	—	—
Shares surrendered by employees to pay taxes	(0.1)	—	(8.3)	—	—	(8.3)
Share-based compensation	—	—	39.6	—	—	39.6
Balance - December 31, 2017	180.3	$ 1.8	$ 2,797.7	$ 2,481.7	$ (243.4)	$ 5,037.8
Net income	—	—	—	347.4	—	347.4
Cumulative effect of accounting changes	—	—	—	(214.0)	—	(214.0)
Other comprehensive income, net of tax	—	—	—	—	62.6	62.6
Distribution to nVent	—	—	(438.2)	(2,291.0)	(47.8)	(2,777.0)
Dividends declared	—	—	—	(154.9)	—	(154.9)
Share repurchases	(10.2)	(0.1)	(499.9)	—	—	(500.0)
Exercise of options, net of shares tendered for payment	0.9	—	24.3	—	—	24.3
Issuance of restricted shares, net of cancellations	0.5	—	—	—	—	—
Shares surrendered by employees to pay taxes	(0.1)	—	(11.0)	—	—	(11.0)
Share-based compensation	—	—	20.9	—	—	20.9
Balance - December 31, 2018	171.4	$ 1.7	$ 1,893.8	$ 169.2	$ (228.6)	$ 1,836.1

See accompanying notes to consolidated financial statements.

1. Basis of Presentation and Summary of Significant Accounting Policies

Business

Pentair plc and its consolidated subsidiaries ("we," "us," "our," "Pentair" or the "Company") is a pure play water company comprised of three reporting segments: Aquatic Systems, Filtration Solutions and Flow Technologies.

Electrical separation

On April 30, 2018, Pentair completed the separation of its Electrical business from the rest of Pentair (the "Separation") by means of a dividend in specie of the Electrical business, which was effected by the transfer of the Electrical business from Pentair to nVent Electric plc ("nVent") and the issuance by nVent of ordinary shares directly to Pentair shareholders (the "Distribution"). On May 1, 2018, following the Separation and Distribution, nVent became an independent publicly traded company, trading on the New York Stock Exchange under the symbol "NVT."

The Company did not retain any equity interest in nVent. nVent's historical financial results are reflected in the Company's consolidated financial statements as a discontinued operation. Refer to Note 2 for further discussion.

In connection with the Distribution of nVent, the Company and nVent entered into several agreements covering administrative and tax matters to provide or obtain services on a transitional basis, as needed, for varying periods after the Distribution. The administrative agreements cover various services such as information technology, human resources and finance. The Company expects all services to be substantially complete within one year after the Distribution.

Basis of presentation

The accompanying consolidated financial statements include the accounts of Pentair and all subsidiaries, both the United States ("U.S.") and non-U.S., which we control. Intercompany accounts and transactions have been eliminated. Investments in companies of which we own 20% to 50% of the voting stock or have the ability to exercise significant influence over operating and financial policies of the investee are accounted for using the equity method of accounting and as a result, our share of the earnings or losses of such equity affiliates is included in the Consolidated Statements of Operations and Comprehensive Income.

The consolidated financial statements have been prepared in U.S. dollars ("USD") and in accordance with accounting principles generally accepted in the United States of America ("GAAP").

Fiscal year

Our fiscal year ends on December 31. We report our interim quarterly periods on a calendar quarter basis.

Use of estimates

The preparation of our consolidated financial statements in conformity with GAAP requires us to make estimates and assumptions that affect the amounts reported in these consolidated financial statements and accompanying notes, disclosures of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. These estimates include our accounting for valuation of goodwill and indefinite lived intangible assets, estimated losses on accounts receivable, estimated realizable value on excess and obsolete inventory, percentage of completion revenue recognition, assets acquired and liabilities assumed in acquisitions, estimated selling proceeds from assets held for sale, contingent liabilities, income taxes, pension and other post-retirement benefits and the estimated impact of the new lease standard, discussed below. Actual results could differ from our estimates.

Revenue recognition

Revenue is recognized when control of the promised goods or services are transferred to our customers, in an amount that reflects the consideration we expect to be entitled to in exchange for transferring those goods or providing services. We account for a contract when it has approval and commitment from both parties, the rights of the parties are identified, payment terms are identified, the contract has commercial substance and collectability of consideration is probable.

When determining whether the customer has obtained control of the goods or services, we consider any future performance obligations. Generally, there is no post-shipment obligation on product sold other than warranty obligations in the normal and ordinary course of business. In the event significant post-shipment obligations were to exist, revenue recognition would be deferred until Pentair has substantially accomplished what it must do to be entitled to the benefits represented by the revenue.

Performance obligations
A performance obligation is a promise in a contract to transfer a distinct good or service to the customer, and is the unit of account for purposes of revenue recognition. A contract's transaction price is allocated to each distinct performance obligation and recognized as revenue when, or as, the performance obligation is satisfied. The majority of our contracts have a single performance obligation as the promise to transfer the individual goods or services is not separately identifiable from other promises in the contracts and, therefore, not distinct. For contracts with multiple performance obligations, standalone selling price is generally readily observable.

Our performance obligations are satisfied at a point in time or over time as work progresses. Revenue from goods and services transferred to customers at a point in time accounted for 92.5% , 92.4% and 94.0% of our revenue for the twelve months ended December 31, 2018, 2017 and 2016, respectively. Revenue on these contracts is recognized when obligations under the terms of the contract with our customer are satisfied; generally this occurs with the transfer of control upon shipment.

Revenue from products and services transferred to customers over time accounted for 7.5% , 7.6% and 6.0% of our revenue for the twelve months ended December 31, 2018, 2017 and 2016, respectively. For the majority of our revenue recognized over time, we use an input measure to determine progress towards completion. Under this method, sales and gross profit are recognized as work is performed generally based on the relationship between the actual costs incurred and the total estimated costs at completion ("the cost-to-cost method") or based on efforts for measuring progress towards completion in situations in which this approach is more representative of the progress on the contract than the cost-to-cost method. Contract costs include labor, material, overhead and, when appropriate, general and administrative expenses. Changes to the original estimates may be required during the life of the contract, and such estimates are reviewed on a regular basis. Sales and gross profit are adjusted using the cumulative catch-up method for revisions in estimated total contract costs. These reviews have not resulted in adjustments that were significant to our results of operations. For performance obligations related to long term contracts, when estimates of total costs to be incurred on a performance obligation exceed total estimates of revenue to be earned, a provision for the entire loss on the performance obligation is recognized in the period the loss is determined.

On December 31, 2018, we had $57.2 million of remaining performance obligations on contracts with an original expected duration of one year or more. We expect to recognize the majority of our remaining performance obligations on these contracts within the next 12 to 18 months.

Sales returns
The right of return may exist explicitly or implicitly with our customers. Our return policy allows for customer returns only upon our authorization. Goods returned must be product we continue to market and must be in salable condition. When the right of return exists, we adjust the transaction price for the estimated effect of returns. We estimate the expected returns based on historical sales levels, the timing and magnitude of historical sales return levels as a percent of sales, type of product, type of customer and a projection of this experience into the future.

Pricing and sales incentives
Our contracts may give customers the option to purchase additional goods or services priced at a discount. Options to acquire additional goods or services at a discount can come in many forms, such as customer programs and incentive offerings including pricing arrangements, promotions and other volume-based incentives.

We reduce the transaction price for certain customer programs and incentive offerings including pricing arrangements, promotions and other volume-based incentives that represent variable consideration. Sales incentives given to our customers are recorded using either the expected value method or most likely amount approach for estimating the amount of consideration to which Pentair shall be entitled. The expected value is the sum of probability-weighted amounts in a range of possible consideration amounts. An expected value is an appropriate estimate of the amount of variable consideration when there are a large number of contracts with similar characteristics. The most likely amount is the single most likely amount in a range of possible consideration amounts (that is, the single most likely outcome of the contract). The most likely amount is an appropriate estimate of the amount of variable consideration if the contract has limited possible outcomes (for example, an entity either achieves a performance bonus or does not).

Pricing is established at or prior to the time of sale with our customers, and we record sales at the agreed-upon net selling price. However, one of our businesses allows customers to apply for a refund of a percentage of the original purchase price if they can demonstrate sales to a qualifying end customer. We use the expected value method to estimate the anticipated refund to be paid based on historical experience and reduce sales for the probable cost of the discount. The cost of these refunds is recorded as a reduction of the transaction price.

Volume-based incentives involve rebates that are negotiated at or prior to the time of sale with the customer and are redeemable only if the customer achieves a specified cumulative level of sales or sales increase. Under these incentive programs, at the time of sale, we determine the most likely amount of the rebate to be paid based on forecasted sales levels. These forecasts are updated at least quarterly for each customer, and the transaction price is reduced for the anticipated cost of the rebate. If the forecasted sales for a customer change, the accrual for rebates is adjusted to reflect the new amount of rebates expected to be earned by the customer.

Shipping and handling costs
Amounts billed to customers for shipping and handling activities after the customer obtains control are treated as a promised service performance obligation and recorded in *Net sales* in the accompanying Consolidated Statements of Operations and Comprehensive Income. Shipping and handling costs incurred by Pentair for the delivery of goods to customers are considered a cost to fulfill the contract and are included in *Cost of goods sold* in the accompanying Consolidated Statements of Operations and Comprehensive Income.

Contract assets and liabilities
Contract assets consist of unbilled amounts resulting from sales under long-term contracts when the cost-to-cost method of revenue recognition is utilized and revenue recognized exceeds the amount billed to the customer, such as when the customer retains a small portion of the contract price until completion of the contract. We typically receive interim payments on sales under long-term contracts as work progresses, although for some contracts, we may be entitled to receive an advance payment. Contract liabilities consist of advanced payments, billings in excess of costs incurred and deferred revenue.

Contract assets are recorded within *Other current assets* , and contract liabilities are recorded within *Other current liabilities* in the Consolidated Balance Sheets.

Contract assets and liabilities consisted of the following:

	December 31			
In millions	**2018**	**2017**	**$ Change**	**% Change**
Contract assets	$ 36.5	$ 51.5	$ (15.0)	(29.1)%
Contract liabilities	32.8	29.2	3.6	12.3 %
Net contract assets	$ 3.7	$ 22.3	$ (18.6)	(83.4)%

The $18.6 million decrease in net contract assets from December 31, 2017 to December 31, 2018 was primarily the result of timing of milestone payments. Approximately 70% of our contract liabilities at December 31, 2017 were recognized in revenue during the twelve months ended December 31, 2018 . There were no impairment losses recognized on our contract assets for the twelve months ended December 31, 2018 .

Practical expedients and exemptions
We generally expense incremental costs of obtaining a contract when incurred because the amortization period would be less than one year. These costs primarily relate to sales commissions and are recorded in *Selling, general and administrative expense* in the Consolidated Statements of Operations and Comprehensive Income.

We do not disclose the value of unsatisfied performance obligations for contracts with an original expected length of one year or less. Further, we do not adjust the promised amount of consideration for the effects of a significant financing component if we expect, at contract inception, that the period between when we transfer a promised good or service to a customer and when the customer pays for that good or service will be one year or less.

Revenue by category
We disaggregate our revenue from contracts with customers by segment, geographic location and vertical, as we believe these best depict how the nature, amount, timing and uncertainty of our revenue and cash flows are affected by economic factors. Refer to Note 14 for revenue disaggregated by segment.

Geographic net sales information for continuing operations, based on geographic destination of the sale, was as follows:

	Years ended December 31		
In millions	**2018**	**2017**	**2016**
U.S.	$ 1,858.1	$ 1,752.7	$ 1,690.0
Western Europe	402.7	381.9	377.7
Developing [(1)]	476.5	478.2	492.0
Other Developed [(2)]	227.8	232.9	220.9
Consolidated net sales [(3)]	$ 2,965.1	$ 2,845.7	$ 2,780.6

(1) Developing includes China, Eastern Europe, Latin America, the Middle East and Southeast Asia.

(2) Other Developed includes Australia, Canada and Japan.

(3) Net sales held in Ireland, for each of the years presented, were not material.

Vertical net sales information was as follows:

	Years ended December 31		
In millions	**2018**	**2017**	**2016**
Residential	$ 1,665.9	$ 1,579.0	$ 1,498.7
Commercial	630.7	604.4	586.5
Industrial	668.5	662.3	695.4
Consolidated net sales	$ 2,965.1	$ 2,845.7	$ 2,780.6

Research and development
We conduct research and development ("R&D") activities primarily in our own facilities, which mostly consist of development of new products, product applications and manufacturing processes. We expense R&D costs as incurred. R&D expenditures from continuing operations during 2018 , 2017 and 2016 were $76.7 million , $73.2 million and $73.3 million , respectively.

Cash equivalents
We consider highly liquid investments with original maturities of three months or less at the date of acquisition to be cash equivalents.

Trade receivables and concentration of credit risk
We record an allowance for doubtful accounts, reducing our receivables balance to an amount we estimate is collectible from our customers. Estimates used in determining the allowance for doubtful accounts are based on current trends, aging of accounts receivable, periodic credit evaluations of our customers' financial condition, and historical collection experience. We generally do not require collateral.

Inventories
Inventories are stated at the lower of cost or market with substantially all inventories recorded using the first-in, first-out ("FIFO") cost method.

Property, plant and equipment, net
Property, plant and equipment is stated at historical cost. We compute depreciation by the straight-line method based on the following estimated useful lives:

	Years
Land improvements	5 to 20
Buildings and leasehold improvements	5 to 50
Machinery and equipment	3 to 15

Significant improvements that add to productive capacity or extend the lives of properties are capitalized. Costs for repairs and maintenance are charged to expense as incurred. When property is retired or otherwise disposed of, the recorded cost of the assets and their related accumulated depreciation are removed from the Consolidated Balance Sheets and any related gains or losses are included in income.

The following table presents geographic *Property, plant and equipment, net* by region as of December 31:

In millions	2018	2017
U.S.	$ 156.9	$ 151.9
Western Europe	76.6	82.8
Developing [1]	28.8	33.0
Other Developed [2]	10.3	12.1
Consolidated [3]	$ 272.6	$ 279.8

[1] Developing includes China, Eastern Europe, Latin America, the Middle East and Southeast Asia.

[2] Other Developed includes Australia, Canada and Japan.

[3] Property, plant and equipment, net held in Ireland, for each of the years presented, were not material.

We review the recoverability of long-lived assets to be held and used, such as property, plant and equipment, when events or changes in circumstances occur that indicate the carrying value of the asset or asset group may not be recoverable. The assessment of possible impairment is based on our ability to recover the carrying value of the asset or asset group from the expected future pre-tax cash flows (undiscounted and without interest charges) of the related operations. If these cash flows are less than the carrying value of such asset or asset group, an impairment loss is recognized for the difference between estimated fair value and carrying value. Impairment losses on long-lived assets held for sale are determined in a similar manner, except that fair values are reduced for the cost to dispose of the assets. The measurement of impairment requires us to estimate future cash flows and the fair value of long-lived assets. We recorded no long-lived asset impairment charges in 2018 , 2017 , or 2016 in conjunction with restructuring activities.

Goodwill and identifiable intangible assets

Goodwill

Goodwill represents the excess of the cost of acquired businesses over the net of the fair value of identifiable tangible net assets and identifiable intangible assets purchased and liabilities assumed.

Goodwill is tested at least annually for impairment and is tested for impairment more frequently if events or changes in circumstances indicate that the asset might be impaired. We complete our annual goodwill impairment evaluation as of the first day of the fourth quarter. We last performed a two-step assessment of goodwill impairment as of October 1, 2017, referred to as a “step 1” approach. In the first step of the step 1 approach, the fair value of each reporting unit is compared with the carrying amount of the reporting unit, including goodwill. If the estimated fair value is less than the carrying amount of the reporting unit there is an indication that goodwill impairment exists and a second step must be completed in order to determine the amount of the goodwill impairment, if any, that should be recorded. In the second step of the step 1 approach, an impairment loss is recognized for any excess of the carrying amount of the reporting unit’s goodwill over the implied fair value of that goodwill. The implied fair value of goodwill is determined by allocating the fair value of the reporting unit in a manner similar to a purchase price allocation.

The fair value of each reporting unit is determined using a discounted cash flow analysis and market approach. Projecting discounted future cash flows requires us to make significant estimates regarding future revenues and expenses, projected capital expenditures, changes in working capital and the appropriate discount rate. Use of the market approach consists of comparisons to comparable publicly-traded companies that are similar in size and industry. Actual results may differ from those used in our valuations. In developing our discounted cash flow analysis, assumptions about future revenues and expenses, capital expenditures and changes in working capital, are based on our annual operating plan and long-term business plan for each of our reporting units. These plans take into consideration numerous factors including historical experience, anticipated future economic conditions, changes in raw material prices and growth expectations for the industries and end markets we participate in. These assumptions are determined over a six year long-term planning period. The six year growth rates for revenues and operating profits vary for each reporting unit being evaluated.

Discount rate assumptions for each reporting unit take into consideration our assessment of risks inherent in the future cash flows of the respective reporting unit and our weighted-average cost of capital.

In estimating fair value using the market approach, we identify a group of comparable publicly-traded companies for each reporting unit that are similar in terms of size and product offering. These groups of comparable companies are used to develop multiples based on total market-based invested capital as a multiple of earnings before interest, taxes, depreciation and amortization (“EBITDA”). We determine our estimated values by applying these comparable EBITDA multiples to the operating results of our reporting units. The ultimate fair value of each reporting unit is determined considering the results of both valuation methods.

As of October 1, 2018, we performed a qualitative assessment, referred to as a "step 0" approach, and determined that it was more likely than not that the fair value of the reporting units exceeded their respective carrying amounts. As a result, the Company was not required to proceed to a "step 1" impairment assessment. Factors considered included the 2017 "step 1" analysis and the calculated excess fair value over carrying amount, financial performance, forecasts and trends, market cap, regulatory and environmental issues, macro-economic conditions, industry and market considerations, raw material costs and management stability. We consider the extent to which each of the adverse events and circumstances identified affect the comparison of the respective reporting unit's fair value with its carrying amount. We place more weight on the events and circumstances that most affect the respective reporting unit's fair value or the carrying amount of its net assets. We consider positive and mitigating events and circumstances that may affect its determination of whether it is more likely than not that the fair value exceeds the carrying amount.

We completed our annual goodwill impairment evaluation as of the first day of the fourth quarter of 2018, 2017 and 2016 with no indications of impairment. This non-recurring fair value measurement is a "Level 3" measurement under the fair value hierarchy described in Note 9.

Identifiable intangible assets
Our primary identifiable intangible assets include: customer relationships, trade names, proprietary technology and patents. Identifiable intangibles with finite lives are amortized and those identifiable intangibles with indefinite lives are not amortized. Identifiable intangible assets that are subject to amortization are evaluated for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. Identifiable intangible assets not subject to amortization are tested for impairment annually or more frequently if events warrant. We complete our annual impairment test during the fourth quarter each year for those identifiable assets not subject to amortization.

The impairment test for trade names consists of a comparison of the fair value of the trade name with its carrying value. Fair value is measured using the relief-from-royalty method. This method assumes the trade name has value to the extent that the owner is relieved of the obligation to pay royalties for the benefits received from them. This method requires us to estimate the future revenue for the related brands, the appropriate royalty rate and the weighted average cost of capital. The non-recurring fair value measurement is a "Level 3" measurement under the fair value hierarchy described in Note 9.

There were no impairment charges recorded in 2018 for identifiable intangible assets.

An impairment charge of $8.8 million was recorded in 2017 related to certain trade names in Filtration Solutions and Flow Technologies as a result of lower forecasted sales volume or rebranding strategies implemented in the fourth quarter of 2017. The trade name impairment charges were recorded in *Selling, general and administrative* in our Consolidated Statements of Operations and Comprehensive Income.

There were no impairment charges recorded in 2016 for identifiable intangible assets.

Income taxes
We use the asset and liability approach to account for income taxes. Under this method, deferred tax assets and liabilities are recognized for the expected future tax consequences of differences between the carrying amounts of assets and liabilities and their respective tax bases using enacted tax rates in effect for the year in which the differences are expected to reverse. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period when the change is enacted. We maintain valuation allowances unless it is more likely than not that all or a portion of the deferred tax assets will be realized. Changes in valuation allowances from period to period are included in our tax provision in the period of change. We recognize the effect of income tax positions only if those positions are more likely than not of being sustained. Recognized income tax positions are measured at the largest amount that is greater than 50% likely of being realized. Changes in recognition or measurement are reflected in the period in which the change in judgment occurs.

Pension and other post-retirement plans
We sponsor U.S. and non-U.S. defined-benefit pension and other post-retirement plans. The pension and other post-retirement benefit costs for company-sponsored benefit plans are determined from actuarial assumptions and methodologies, including discount rates and expected returns on plan assets. These assumptions are updated annually and are disclosed in Note 11.

We recognize changes in the fair value of plan assets and net actuarial gains or losses for pension and other post-retirement benefits annually in the fourth quarter each year ("mark-to-market adjustment") and, if applicable, in any quarter in which an interim remeasurement is triggered. Net actuarial gains and losses occur when the actual experience differs from any of the various assumptions used to value our pension and other post-retirement plans or when assumptions change, as they may each year. The remaining components of pension expense, including service and interest costs and estimated return on plan assets, are recorded on a quarterly basis.

Insurance subsidiary
We insure certain general and product liability, property, workers' compensation and automobile liability risks through our regulated wholly-owned captive insurance subsidiary, Penwald Insurance Company ("Penwald"). Reserves for policy claims are established based on actuarial projections of ultimate losses. As of December 31, 2018 and 2017, reserves for policy claims were $60.9 million , of which $13.2 million was included in *Other current liabilities* and $47.7 million was included in *Other non-current liabilities* , and $61.5 million , of which $13.2 million was included in *Other current liabilities* and $48.3 million was included in *Other non-current liabilities* , respectively.

Share-based compensation
We account for share-based compensation awards on a fair value basis. The estimated grant date fair value of each option award is recognized in income on an accelerated basis over the requisite service period (generally the vesting period). The estimated fair value of each option award is calculated using the Black-Scholes option-pricing model. From time to time, we have elected to modify the terms of the original grant. These modified grants are accounted for as a new award and measured using the fair value method, resulting in the inclusion of additional compensation expense in our Consolidated Statements of Operations and Comprehensive Income.

Restricted share awards and units ("RSUs") are recorded as compensation cost over the requisite service periods based on the market value on the date of grant.

Performance share units ("PSUs") are stock awards where the ultimate number of shares issued will be contingent on the Company's performance against certain financial performance targets. The fair value of each PSU is based on the market value on the date of grant. We recognize expense related to the estimated vesting of our PSUs granted. The estimated vesting of the PSUs is based on the probability of achieving certain financial performance thresholds over the specified performance period.

Earnings per ordinary share
We present two calculations of earnings per ordinary share ("EPS"). Basic EPS equals net income divided by the weighted-average number of ordinary shares outstanding during the period. Diluted EPS is computed by dividing net income by the sum of weighted-average number of ordinary shares outstanding plus dilutive effects of ordinary share equivalents.

Derivative financial instruments
We recognize all derivatives, including those embedded in other contracts, as either assets or liabilities at fair value in our Consolidated Balance Sheets. If the derivative is designated and is effective as a cash-flow hedge, the effective portion of changes in the fair value of the derivative are recorded in *Accumulated other comprehensive income (loss)* ("AOCI") as a separate component of equity in the Consolidated Balance Sheets and are recognized in the Consolidated Statements of Operations and Comprehensive Income when the hedged item affects earnings. If the underlying hedged transaction ceases to exist or if the hedge becomes ineffective, all changes in fair value of the related derivatives that have not been settled are recognized in current earnings. For a derivative that is not designated as or does not qualify as a hedge, changes in fair value are reported in earnings immediately.

Gains and losses on net investment hedges are included in AOCI as a separate component of equity in the Consolidated Balance Sheets.

We use derivative instruments for the purpose of hedging interest rate and currency exposures, which exist as part of ongoing business operations. We do not hold or issue derivative financial instruments for trading or speculative purposes. All other contracts that contain provisions meeting the definition of a derivative also meet the requirements of and have been designated as, normal purchases or sales. Our policy is not to enter into contracts with terms that cannot be designated as normal purchases or sales. From time to time, we may enter into short duration foreign currency contracts to hedge foreign currency risks.

Foreign currency translation
The financial statements of subsidiaries located outside of the U.S. are generally measured using the local currency as the functional currency, except for certain corporate entities outside of the U.S. which are measured using USD. Assets and liabilities of these subsidiaries are translated at the rates of exchange at the balance sheet date. Income (Loss) and expense items are translated at average monthly rates of exchange. The resultant translation adjustments are included in AOCI, a component of equity.

New accounting standards
In February 2016, the Financial Accounting Standards Board issued ASU No. 2016-02, "Leases" ("the new lease standard" or "ASC 842"), which requires an entity to recognize both assets and liabilities arising from financing and operating leases, along with additional qualitative and quantitative disclosures. The new lease standard requirements are effective for annual reporting periods beginning after December 15, 2018, including interim periods within that reporting period. We adopted the new lease guidance as of January 1, 2019, using the transition method of adoption applied to those leases which were not completed as of that date. Under the transition method of adoption, comparative periods will not be restated for the new standard. We also elected the package of practical expedients permitted under the transition guidance, which among other things allowed us to carry forward the historical lease classification. In preparation for adoption of the new guidance, we have implemented appropriate changes to our business processes, systems and controls to support preparation of financial information and have reached conclusions on key accounting assessments related to the standard. As a result of these assessments, we anticipate the adoption of the new standard to increase assets and liabilities on the consolidated balance sheet by approximately $75.0 million as of the adoption date. We currently do not expect ASC 842 to have a material effect on either our consolidated statements of operations and comprehensive income or consolidated statements of cash flows.

On January 1, 2018, we adopted ASU No. 2017-01, "Clarifying the Definition of a Business." This ASU clarifies the definition of a business and provides guidance on whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. The adoption of the new standard did not have a material impact on our consolidated financial statements.

On January 1, 2018, we adopted ASU No. 2017-07, "Retirement Benefits-Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost." As a result of the adoption, the interest cost, expected return on plan assets and net actuarial gain/loss components of net periodic pension and post-retirement benefit cost have been reclassified from *Selling, general and administrative expense* to *Other (income) expense* . Only the service cost component remains in *Operating income* and will be eligible for capitalization in assets on a prospective basis. The effect of the retrospective presentation change related to the net periodic cost of our defined benefit pension and other post-retirement plans on our Consolidated Statements of Operations and Comprehensive Income was a reclassification of expense of $13.9 million and income of $6.2 million for the years ended December 31, 2017 and 2016, respectively, from *Selling, general and administrative expense* to *Other (income) expense* .

On January 1, 2018, we adopted ASU No. 2016-16, "Accounting for Income Taxes: Intra-Entity Asset Transfers of Assets Other than Inventory." This ASU requires the tax effects of all intra-entity sales of assets other than inventory to be recognized in the period in which the transaction occurs. The adoption resulted in a $215.8 million cumulative-effect adjustment (of which $174.6 million related to nVent) recorded in retained earnings as of the beginning of 2018. The adjustment reflects a $254.3 million reduction of a prepaid long term tax asset, partially offset by the establishment of $38.5 million of deferred tax assets.

On January 1, 2018, we adopted ASU No. 2014-09, "Revenue from Contracts with Customers" and the related amendments ("the new revenue standard") using the modified retrospective method. The cumulative impact to our retained earnings at January 1, 2018 was not material. The comparative information has not been restated and continues to be reported under the accounting standards in effect for those periods. We expect the impact of the adoption of the new standard to be immaterial to our net income on an ongoing basis.

A majority of our net sales continue to be recognized when products are shipped from our manufacturing facilities or delivery has occurred, depending on terms of the sale. Under the new revenue standard, timing for recognition of certain revenue may be accelerated such that a portion of revenue will be recognized prior to shipment or delivery dependent upon contract-specific terms.

The cumulative effect of the changes made to our January 1, 2018 Consolidated Balance Sheet from the modified retrospective adoption of ASU 2016-16 and ASU 2014-09 was as follows:

Consolidated Balance Sheets

In millions	Balance at December 31, 2017	Adjustments due to ASU 2016-16	Adjustments due to ASU 2014-09	Balance at January 1, 2018
Assets				
Accounts and notes receivable, net	$ 483.1	$ —	$ 2.7	$ 485.8
Inventories	356.9	—	(1.6)	355.3
Other current assets	114.5	—	1.6	116.1
Current assets held for sale	708.0	—	3.8	711.8
Other non-current assets	180.9	(44.9)	—	136.0
Non-current assets held for sale	3,989.6	(201.6)	—	3,788.0
Liabilities				
Other current liabilities	401.3	—	2.7	404.0
Deferred tax liabilities	108.6	(3.7)	0.1	105.0
Non-current liabilities held for sale	537.0	(27.0)	0.4	510.4
Equity				
Retained Earnings	2,481.7	(215.8)	1.8	2,267.7

2. Acquisitions and Discontinued Operations

Acquisitions

In January 2019, as part of Filtration Solutions, we entered into definitive agreements to acquire Aquion Inc. (“Aquion”) and Pelican Water Systems (“Pelican”) for $160.0 million and $120.0 million in cash, respectively, and subject to certain customary adjustments. We completed the Aquion acquisition on February 13, 2019 and the Pelican acquisition on February 12, 2019.

Aquion offers a diverse line of water conditioners, water filters, drinking-water purifiers, ozone and ultraviolet disinfection systems, reverse osmosis systems and acid neutralizers for the residential and commercial water treatment industry. Pelican Water Systems provides residential whole home water treatment systems. These acquisitions are not expected to have a material impact on our consolidated financial position, results of operations or cash flows.

During 2017, our continuing operations completed acquisitions with purchase prices totaling $45.9 million in cash, net of cash acquired. Identifiable intangible assets acquired included $19.1 million of definite-lived customer relationships with an estimated useful life of 11 years .

In November 2016, our continuing operations completed an acquisition with a purchase price of $25.0 million in cash, net of cash acquired.

The pro forma impact of these acquisitions was not material.

Discontinued Operations

Electrical separation

On April 30, 2018, we completed the Separation and Distribution. The results of the Electrical business have been presented as discontinued operations and the related assets and liabilities were reclassified as held for sale for all periods presented. The Electrical business had been previously disclosed as a stand-alone reporting segment. Separation costs related to the Separation and Distribution were $84.2 million and $39.3 million for the twelve months ended December 31, 2018 and 2017, respectively. These costs are reported in discontinued operations as they represent a cost directly related to the Separation and Distribution and were included within *Income from discontinued operations, net of tax* presented below.

There were no separation costs related to the Separation and Distribution for the twelve months ended December 31, 2016.

Sale of Valves & Controls
On April 28, 2017, we completed the sale of the Valves & Controls business to Emerson Electric Co. for $3.15 billion in cash. The sale resulted in a gain of $181.1 million , net of tax. The results of the Valves & Controls business have been presented as discontinued operations. The Valves & Controls business was previously disclosed as a stand-alone reporting segment. Transaction costs of $56.4 million related to the sale of Valves & Controls were incurred during the year ended December 31, 2017 and were recorded within *Gain from sale/impairment of discontinued operations before income taxes* presented below.

Operating results of discontinued operations are summarized below:

	Years ended December 31		
In millions	**2018**	**2017**	**2016**
Net sales	$ 693.9	$ 2,548.2	$ 3,755.4
Cost of goods sold	424.0	1,596.2	2,457.1
Gross profit	269.9	952.0	1,298.3
Selling, general and administrative	237.8	589.2	803.2
Research and development	14.6	48.3	59.0
Operating income	$ 17.5	$ 314.5	$ 436.1
Income from discontinued operations before income taxes	$ 31.8	$ 317.1	$ 418.5
Income tax provision (benefit)	6.1	(54.2)	75.1
Income from discontinued operations, net of tax	$ 25.7	$ 371.3	$ 343.4
Gain from sale / impairment of discontinued operations before income taxes	$ —	$ 183.5	$ 0.6
Provision for income taxes	—	2.4	—
Gain from sale / impairment of discontinued operations, net of tax	$ —	$ 181.1	$ 0.6

The carrying amounts of major classes of assets and liabilities that were classified as held for sale on the Consolidated Balance Sheets were as follows:

	December 31
In millions	**2017**
Cash and cash equivalents	$ 27.0
Accounts receivable, net	348.5
Inventories	224.1
Other current assets	108.4
Current assets held for sale	$ 708.0
Property, plant and equipment, net	$ 265.8
Goodwill	2,238.2
Intangibles, net	1,236.6
Other non-current assets	249.0
Non-current assets held for sale	$ 3,989.6
Accounts payable	$ 174.1
Employee compensation and benefits	70.8
Other current liabilities	115.9
Current liabilities held for sale	$ 360.8
Pension and other post-retirement compensation and benefits	$ 189.2
Deferred tax liabilities	286.2
Other non-current liabilities	61.6
Non-current liabilities held for sale	$ 537.0

3. Earnings Per Share

Basic and diluted earnings per share were calculated as follows:

	Years ended December 31		
In millions, except per share data	**2018**	**2017**	**2016**
Net income	$ 347.4	$ 666.5	$ 522.2
Net income from continuing operations	$ 321.7	$ 114.1	$ 178.2
Weighted average ordinary shares outstanding			
Basic	175.8	181.7	181.3
Dilutive impact of stock options and restricted stock awards	1.5	2.0	1.8
Diluted	177.3	183.7	183.1
Earnings per ordinary share			
Basic			
Continuing operations	$ 1.83	$ 0.63	$ 0.98
Discontinued operations	0.15	3.04	1.90
Basic earnings per ordinary share	$ 1.98	$ 3.67	$ 2.88
Diluted			
Continuing operations	$ 1.81	$ 0.62	$ 0.97
Discontinued operations	0.15	3.01	1.88
Diluted earnings per ordinary share	$ 1.96	$ 3.63	$ 2.85
Anti-dilutive stock options excluded from the calculation of diluted earnings per share	1.2	1.8	1.2

4. Restructuring

During 2018 , 2017 and 2016 , we initiated and continued execution of certain business restructuring initiatives aimed at reducing our fixed cost structure and realigning our business. Initiatives during the years ended December 31, 2018 , 2017 and 2016 included a reduction in hourly and salaried headcount of approximately 300 employees, 250 employees and 300 employees, respectively.

Restructuring related costs included in *Selling, general and administrative* expenses in the Consolidated Statements of Operations and Comprehensive Income included costs for severance and other restructuring costs as follows:

	Years ended December 31		
In millions	**2018**	**2017**	**2016**
Severance and related costs	$ 13.2	$ 27.3	$ 12.2
Other	27.4	0.9	—
Total restructuring costs	$ 40.6	$ 28.2	$ 12.2

Other restructuring costs primarily consist of asset impairment and various contract termination costs.

Restructuring costs by reportable segment were as follows:

	Years ended December 31		
In millions	**2018**	**2017**	**2016**
Aquatic Systems	$ 15.3	$ 3.6	$ 1.8
Filtration Solutions	14.6	13.0	7.4
Flow Technologies	9.3	7.0	1.3
Other	1.4	4.6	1.7
Consolidated	$ 40.6	$ 28.2	$ 12.2

Activity related to accrued severance and related costs recorded in *Other current liabilities* in the Consolidated Balance Sheets is summarized as follows:

	Years ended December 31	
In millions	**2018**	**2017**
Beginning balance	$ 34.5	$ 15.1
Costs incurred	13.2	27.3
Cash payments and other	(20.6)	(7.9)
Ending balance	$ 27.1	$ 34.5

5. Goodwill and Other Identifiable Intangible Assets

The changes in the carrying amount of goodwill for the years ended December 31, 2018 and 2017 by reportable segment were as follows:

In millions	**December 31, 2017**	**Foreign currency translation/other**	**December 31, 2018**
Aquatic Systems	$ 973.1	$ (7.2)	$ 965.9
Filtration Solutions	667.6	(24.1)	643.5
Flow Technologies	472.1	(8.8)	463.3
Total goodwill	$ 2,112.8	$ (40.1)	$ 2,072.7

In millions	**December 31, 2016**	**Acquisitions/ divestitures**	**Foreign currency translation/other**	**December 31, 2017**
Aquatic Systems	$ 918.7	$ —	$ 54.4	$ 973.1
Filtration Solutions	630.2	27.3	10.1	667.6
Flow Technologies	445.7	—	26.4	472.1
Total goodwill	$ 1,994.6	$ 27.3	$ 90.9	$ 2,112.8

There has been no impairment of goodwill for any of the years presented.

Identifiable intangible assets consisted of the following at December 31:

	2018			**2017**		
In millions	**Cost**	**Accumulated amortization**	**Net**	**Cost**	**Accumulated amortization**	**Net**
Definite-life intangibles						
Customer relationships	$ 347.1	$ (247.9)	$ 99.2	$ 360.9	$ (229.9)	$ 131.0
Trade names	0.4	(0.4)	—	1.5	(1.4)	0.1
Proprietary technology and patents	86.2	(68.4)	17.8	117.0	(89.3)	27.7
Total finite-life intangibles	433.7	(316.7)	117.0	479.4	(320.6)	158.8
Indefinite-life intangibles						
Trade names	159.3	—	159.3	163.0	—	163.0
Total intangibles	$ 593.0	$ (316.7)	$ 276.3	$ 642.4	$ (320.6)	$ 321.8

Identifiable intangible asset amortization expense in 2018 , 2017 and 2016 was $34.9 million , $36.4 million and $35.4 million , respectively.

There was no impairment charge for trade name intangible assets in 2018 . In 2017 , we recorded an impairment charge for trade name intangible assets of $8.8 million in Filtration Solutions and Flow Technologies. In 2016 , there was no impairment charge for trade name intangible assets.

Estimated future amortization expense for identifiable intangible assets during the next five years is as follows:

In millions	**2019**	**2020**	**2021**	**2022**	**2023**
Estimated amortization expense	$ 27.4	$ 22.4	$ 17.3	$ 10.1	$ 7.8

6. Supplemental Balance Sheet Information

In millions	December 31 2018	2017
Inventories		
Raw materials and supplies	$ 191.3	$ 190.8
Work-in-process	64.0	57.9
Finished goods	132.2	108.2
Total inventories	$ 387.5	$ 356.9
Other current assets		
Cost in excess of billings	$ 36.5	$ 51.5
Prepaid expenses	36.7	51.4
Prepaid income taxes	8.5	7.8
Other current assets	7.7	3.8
Total other current assets	$ 89.4	$ 114.5
Property, plant and equipment, net		
Land and land improvements	$ 33.5	$ 33.5
Buildings and leasehold improvements	178.9	184.3
Machinery and equipment	593.8	609.6
Construction in progress	35.7	23.7
Total property, plant and equipment	841.9	851.1
Accumulated depreciation and amortization	569.3	571.3
Total property, plant and equipment, net	$ 272.6	$ 279.8
Other non-current assets		
Prepaid income taxes	$ —	$ 52.8
Deferred income taxes	26.2	29.0
Deferred compensation plan assets	20.9	23.2
Other non-current assets	98.4	75.9
Total other non-current assets	$ 145.5	$ 180.9
Other current liabilities		
Dividends payable	$ 30.8	$ 63.1
Accrued warranty	33.9	38.1
Accrued rebates	55.7	49.8
Billings in excess of cost	21.3	20.1
Income taxes payable	10.4	39.7
Accrued restructuring	27.1	34.5
Other current liabilities	149.2	156.0
Total other current liabilities	$ 328.4	$ 401.3
Other non-current liabilities		
Income taxes payable	$ 46.8	$ 61.3
Self-insurance liabilities	47.7	48.3
Deferred compensation plan liabilities	20.9	23.2
Foreign currency contract liabilities	30.6	47.2
Other non-current liabilities	22.2	33.8
Total other non-current liabilities	$ 168.2	$ 213.8

7. Accumulated Other Comprehensive Loss

Components of *Accumulated Other Comprehensive Loss* consist of the following:

	December 31	
In millions	**2018**	**2017**
Cumulative translation adjustments	$ (211.4)	$ (221.4)
Market value of derivative financial instruments, net of tax	(17.2)	(22.0)
Accumulated other comprehensive loss	$ (228.6)	$ (243.4)

8. Debt

Debt and the average interest rates on debt outstanding were as follows:

	Average interest rate at	Maturity	December 31	
In millions	**December 31, 2018**	**year**	**2018**	**2017**
Commercial paper	3.248%	2023	$ 76.0	$ 34.0
Revolving credit facilities	3.703%	2023	26.2	28.4
Senior notes - fixed rate [(1)]	2.900%	2018	—	255.3
Senior notes - fixed rate [(1)]	2.650%	2019	250.0	250.0
Senior notes - fixed rate - Euro [(1)]	2.450%	2019	155.1	594.4
Senior notes - fixed rate [(1)]	3.625%	2020	74.0	74.0
Senior notes - fixed rate [(1)]	5.000%	2021	103.8	103.8
Senior notes - fixed rate [(1)]	3.150%	2022	88.3	88.3
Senior notes - fixed rate [(1)]	4.650%	2025	19.3	19.3
Unamortized issuance costs and discounts	N/A	N/A	(5.1)	(6.8)
Total debt			$ 787.6	$ 1,440.7

[(1)] Senior notes guaranteed as to payment by Pentair plc and PISG ("the Notes")

On April 25, 2018, Pentair, Pentair Investments Switzerland GmbH ("PISG"), Pentair Finance S.à r.l. ("PFSA") and Pentair, Inc. entered into a credit agreement, providing for a five -year $800.0 million senior unsecured revolving credit facility (the "Senior Credit Facility"), with Pentair and PISG as guarantors and PFSA and Pentair, Inc. as borrowers. The Senior Credit Facility replaced PFSA's existing credit facility under that certain Amended and Restated Credit Agreement, dated as of October 3, 2014. PFSA has the option to request to increase the Senior Credit Facility in an aggregate amount of up to $300.0 million , subject to customary conditions, including the commitment of the participating lenders. The Senior Credit Facility has a maturity date of April 25, 2023. Borrowings under the Senior Credit Facility bear interest at a rate equal to an adjusted base rate or the London Interbank Offered Rate, plus, in each case, an applicable margin. The applicable margin is based on, at PFSA's election, Pentair's leverage level or PFSA's public credit rating.

PFSA is authorized to sell short-term commercial paper notes to the extent availability exists under the Senior Credit Facility. PFSA uses the Senior Credit Facility as back-up liquidity to support 100% of commercial paper outstanding. PFSA had $76.0 million of commercial paper outstanding as of December 31, 2018 and $34.0 million as of December 31, 2017 , all of which was classified as long-term debt as we have the intent and the ability to refinance such obligations on a long-term basis under the Senior Credit Facility.

Our debt agreements contain various financial covenants, but the most restrictive covenants are contained in the Senior Credit Facility. The Senior Credit Facility contains covenants requiring us not to permit (i) the ratio of our consolidated debt (net of its consolidated unrestricted cash in excess of $5.0 million but not to exceed $250.0 million) to our consolidated net income (excluding, among other things, non-cash gains and losses) before interest, taxes, depreciation, amortization and non-cash share-based compensation expense ("EBITDA") on the last day of any period of four consecutive fiscal quarters to exceed 3.75 to 1.00 (the "Leverage Ratio") and (ii) the ratio of our EBITDA to our consolidated interest expense, for the same period to be less than 3.00 to 1.00 as of the end of each fiscal quarter. For purposes of the Leverage Ratio, the Senior Credit Facility provides for the calculation of EBITDA giving pro forma effect to certain acquisitions, divestitures and liquidations during the period to which such calculation relates. As of December 31, 2018 , we were in compliance with all financial covenants in our debt agreements.

Total availability under the Senior Credit Facility was $697.8 million as of December 31, 2018 .

In addition to the Senior Credit Facility, we have various other credit facilities with an aggregate availability of $21.1 million , of which there were no outstanding borrowings at December 31, 2018 . Borrowings under these credit facilities bear interest at variable rates.

In June 2018, we used the $993.6 million of cash received from nVent as a result of the Distribution to pay down commercial paper and revolving credit facilities, redeem the remaining $255.3 million aggregate principal of our 2.9% fixed rate senior notes due 2018, and complete a cash tender offer in the amount of €363.4 million aggregate principal of our 2.45% senior notes due 2019. All costs associated with the repurchases of debt were recorded as a *Loss on early extinguishment of debt* in the Consolidated Statements of Operations and Comprehensive Income , including $16.0 million premium paid on early extinguishment and $1.1 million of unamortized deferred financing costs.

In May 2017, we repurchased an aggregate principal amount of certain series of outstanding senior notes totaling $1,659.3 million . All costs associated with the repurchases were recorded as *Loss on early extinguishment of debt* , including $6.5 million of unamortized deferred financing costs.

We have $405.1 million aggregate principle amount of fixed rate senior notes maturing in 2019. We classified this debt as long-term as of December 31, 2018 as we have the intent and ability to refinance such obligation on a long-term basis under the Credit Facility.

Debt outstanding, excluding unamortized issuance costs and discounts , at December 31, 2018 matures on a calendar year basis as follows:

In millions	**2019**	**2020**	**2021**	**2022**	**2023**	**Thereafter**	**Total**
Contractual debt obligation maturities	$ 405.1	$ 74.0	$ 103.8	$ 88.3	$ 102.1	$ 19.4	$ 792.7

9. Derivatives and Financial Instruments

Derivative financial instruments

We are exposed to market risk related to changes in foreign currency exchange rates. To manage the volatility related to this exposure, we periodically enter into a variety of derivative financial instruments. Our objective is to reduce, where it is deemed appropriate to do so, fluctuations in earnings and cash flows associated with changes in foreign currency rates. The derivative contracts contain credit risk to the extent that our bank counterparties may be unable to meet the terms of the agreements. The amount of such credit risk is generally limited to the unrealized gains, if any, in such contracts. Such risk is minimized by limiting those counterparties to major financial institutions of high credit quality.

Foreign currency contracts

We conduct business in various locations throughout the world and are subject to market risk due to changes in the value of foreign currencies in relation to our reporting currency, the U.S. dollar. We manage our economic and transaction exposure to certain market-based risks through the use of foreign currency derivative financial instruments. Our objective in holding these derivatives is to reduce the volatility of net earnings and cash flows associated with changes in foreign currency exchange rates. The majority of our foreign currency contracts have an original maturity date of less than one year. The derivative contracts contain credit risk to the extent that our bank counterparties may be unable to meet the terms of the agreements. The amount of such credit risk is generally limited to the unrealized gains, if any, in such contracts. Such risk is minimized by limiting those counterparties to major financial institutions of high credit quality.

At December 31, 2018 and 2017 , we had outstanding foreign currency derivative contracts with gross notional U.S. dollar equivalent amounts of $331.4 million and $481.4 million , respectively. The impact of these contracts on the Consolidated Statements of Operations and Comprehensive Income was not material for any period presented.

Gains or losses on foreign currency contracts designated as hedges are reclassified out of *Accumulated other comprehensive loss* and into *Selling, general and administrative expense* in the Consolidated Statements of Operations and Comprehensive Income when the hedged item affects earnings. Such reclassifications during 2018 , 2017 and 2016 were not material.

Net investment hedge

We have net investments in foreign subsidiaries that are subject to changes in the foreign currency exchange rate. In September 2015, we designated the €500 million 2.45% Senior Notes due 2019 (the “2019 Euro Notes”) as a net investment hedge for a portion of our net investment in our Euro denominated subsidiaries . In June 2018, the Company completed a tender offer for €363.4 million of the 2019 Euro Notes. The remaining €136.6 million of the 2019 Euro Notes have been re-designated as a net

investment hedge in our Euro denominated subsidiaries. The gains/losses on the 2019 Euro Notes have been included as a component of the cumulative translation adjustment account within *Accumulated other comprehensive loss* . As of December 31, 2018 and 2017 , we had deferred foreign currency losses of $0.8 million and $29.6 million , respectively, in *Accumulated other comprehensive loss* associated with the net investment hedge activity.

Fair value measurements
Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Assets and liabilities measured at fair value are classified using the following hierarchy, which is based upon the transparency of inputs to the valuation as of the measurement date:

Level 1: Valuation is based on observable inputs such as quoted market prices (unadjusted) for identical assets or liabilities in active markets.

Level 2: Valuation is based on inputs such as quoted market prices for similar assets or liabilities in active markets or other inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the financial instrument.

Level 3: Valuation is based upon other unobservable inputs that are significant to the fair value measurement.

In making fair value measurements, observable market data must be used when available. When inputs used to measure fair value fall within different levels of the hierarchy, the level within which the fair value measurement is categorized is based on the lowest level input that is significant to the fair value measurement.

Fair value of financial instruments
The following methods were used to estimate the fair values of each class of financial instrument:

- *short-term financial instruments (cash and cash equivalents, accounts and notes receivable, accounts and notes payable and variable-rate debt) —* recorded amount approximates fair value because of the short maturity period;
- *long-term fixed-rate debt, including current maturities —* fair value is based on market quotes available for issuance of debt with similar terms, which are inputs that are classified as Level 2 in the valuation hierarchy defined by the accounting guidance;
- *foreign currency contract agreements —* fair values are determined through the use of models that consider various assumptions, including time value, yield curves, as well as other relevant economic measures, which are inputs that are classified as Level 2 in the valuation hierarchy defined by the accounting guidance; and
- *deferred compensation plan assets (mutual funds, common/collective trusts and cash equivalents for payment of certain non-qualified benefits for retired, terminated and active employees) —* fair value of mutual funds and cash equivalents are based on quoted market prices in active markets that are classified as Level 1 in the valuation hierarchy defined by the accounting guidance; fair value of common/collective trusts are valued at net asset value ("NAV"), which is based on the fair value of the underlying securities owned by the fund and divided by the number of shares outstanding.

The recorded amounts and estimated fair values of total debt, excluding unamortized issuance costs and discounts , at December 31 were as follows:

	2018		2017	
In millions	Recorded Amount	Fair Value	Recorded Amount	Fair Value
Variable rate debt	$ 102.2	$ 102.2	$ 62.4	$ 62.4
Fixed rate debt	690.5	691.8	1,385.1	1,424.0
Total debt	$ 792.7	$ 794.0	$ 1,447.5	$ 1,486.4

Financial assets and liabilities measured at fair value on a recurring and nonrecurring basis were as follows:

Recurring fair value measurements	**December 31, 2018**				
In millions	**Level 1**	**Level 2**	**Level 3**	**NAV**	**Total**
Foreign currency contract liabilities	$ —	$ (30.6)	$ —	$ —	$ (30.6)
Deferred compensation plan assets	17.6	—	—	3.3	20.9
Total recurring fair value measurements	$ 17.6	$ (30.6)	$ —	$ 3.3	$ (9.7)

Recurring fair value measurements	**December 31, 2017**				
In millions	**Level 1**	**Level 2**	**Level 3**	**NAV**	**Total**
Foreign currency contract assets	$ —	$ 0.6	$ —	$ —	$ 0.6
Foreign currency contract liabilities	—	(47.2)	—	—	(47.2)
Deferred compensation plan assets	18.7	—	—	4.5	23.2
Total recurring fair value measurements	$ 18.7	$ (46.6)	$ —	$ 4.5	$ (23.4)
Nonrecurring fair value measurements [1]					

[1] During the fourth quarter of 2017, we completed our annual intangible assets impairment review. As a result, we recorded a pre-tax non-cash impairment charge of $8.8 million for trade name intangibles, reducing the carrying value of these intangibles to $10.8 million . The fair value of trade names is measured using the relief-from-royalty method. This method assumes the trade name has value to the extent that the owner is relieved of the obligation to pay royalties for the benefits received from them. This method requires us to estimate the future revenue for the related brands, the appropriate royalty rate and the weighted average cost of capital.

10. Income Taxes

Income from continuing operations before income taxes consisted of the following:

	Years ended December 31		
In millions	**2018**	**2017**	**2016**
Federal [1]	$ (24.6)	$ (34.1)	$ (25.6)
International [2]	404.4	206.9	246.5
Income from continuing operations before income taxes	$ 379.8	$ 172.8	$ 220.9

[1] "Federal" reflects United Kingdom ("U.K.") income from continuing operations before income taxes.

[2] "International" reflects non-U.K. income from continuing operations before income taxes.

The provision for income taxes consisted of the following:

	Years ended December 31		
In millions	**2018**	**2017**	**2016**
Currently payable (receivable)			
Federal [1]	$ (0.1)	$ —	$ —
International [2]	62.3	76.7	41.5
Total current taxes	62.2	76.7	41.5
Deferred			
Federal [1]	—	—	—
International [2]	(4.1)	(18.0)	1.2
Total deferred taxes	(4.1)	(18.0)	1.2
Total provision for income taxes	$ 58.1	$ 58.7	$ 42.7

[1] "Federal" represents U.K. taxes.

[2] "International" represents non-U.K. taxes.

Reconciliations of the federal statutory income tax rate to our effective tax rate were as follows:

	Years ended December 31		
Percentages	**2018**	**2017**	**2016**
U.K. federal statutory income tax rate	19.0 %	19.3 %	20.0 %
Tax effect of international operations [(1)]	(12.0)	(20.8)	(26.5)
Change in valuation allowances	7.9	27.6	22.1
Withholding taxes	0.3	0.4	1.8
Interest limitations	1.8	1.7	1.5
Excess tax benefits on stock-based compensation	(1.7)	(4.5)	—
Tax effect of U.S. tax reform	(0.9)	1.3	—
Tax effect of early extinguishment of debt	0.9	9.0	—
Other	—	—	0.4
Effective tax rate	15.3 %	34.0 %	19.3 %

(1) The tax effect of international operations consists of non-U.K. jurisdictions.

Reconciliations of the beginning and ending gross unrecognized tax benefits were as follows:

	Years ended December 31		
In millions	**2018**	**2017**	**2016**
Beginning balance	$ 13.8	$ 46.3	$ 25.0
Gross increases for tax positions in prior periods	44.0	4.7	26.9
Gross decreases for tax positions in prior periods	(4.4)	(3.4)	(2.2)
Gross increases based on tax positions related to the current year	0.9	0.7	0.8
Gross decreases related to settlements with taxing authorities	(1.8)	(33.6)	(3.4)
Reductions due to statute expiration	(1.1)	(0.9)	(0.8)
Ending balance	$ 51.4	$ 13.8	$ 46.3

We record gross unrecognized tax benefits in *Other current liabilities* and *Other non-current liabilities* in the Consolidated Balance Sheets. Included in the $51.4 million of total gross unrecognized tax benefits as of December 31, 2018 was $50.3 million of tax benefits that, if recognized, would impact the effective tax rate. It is reasonably possible that the gross unrecognized tax benefits as of December 31, 2018 may decrease by a range of zero to $8.1 million during 2019 , primarily as a result of the resolution of non-U.K. examinations, including U.S. state examinations, and the expiration of various statutes of limitations.

Based on the outcome of these examinations, or as a result of the expiration of statute of limitations for specific jurisdictions, it is reasonably possible that certain unrecognized tax benefits for tax positions taken on previously filed tax returns will materially change from those recorded as liabilities in our financial statements. A number of tax periods from 2003 to present are under audit by tax authorities in various jurisdictions, including China, Germany, India and New Zealand. We anticipate that several of these audits may be concluded in the foreseeable future.

We record penalties and interest related to unrecognized tax benefits in *Provision for income taxes* and *Net interest expense* , respectively, in the Consolidated Statements of Operations and Comprehensive Income. As of December 31, 2018 and 2017 , we have liabilities of $0.5 million and $0.3 million , respectively, for the possible payment of penalties and $3.6 million and $2.9 million , respectively, for the possible payment of interest expense, which are recorded in *Other current liabilities* in the Consolidated Balance Sheets.

Deferred taxes arise because of different treatment between financial statement accounting and tax accounting, known as “temporary differences.” We record the tax effect of these temporary differences as “deferred tax assets” (generally items that can be used as a tax deduction or credit in future periods) and “deferred tax liabilities” (generally items for which we received a tax deduction but the tax impact has not yet been recorded in the Consolidated Statements of Operations and Comprehensive Income).

Deferred taxes were recorded in the Consolidated Balance Sheets as follows:

	December 31	
In millions	**2018**	**2017**
Other non-current assets	$ 26.2	$ 29.0
Deferred tax liabilities	105.9	108.6
Net deferred tax liabilities	$ 79.7	$ 79.6

The tax effects of the major items recorded as deferred tax assets and liabilities were as follows:

	December 31	
In millions	**2018**	**2017**
Deferred tax assets		
Accrued liabilities and reserves	$ 42.9	$ 43.9
Pension and other post-retirement compensation and benefits	25.2	35.7
Employee compensation and benefits	21.8	39.2
Tax loss and credit carryforwards	724.7	670.5
Other assets	4.4	—
Total deferred tax assets	819.0	789.3
Valuation allowance	711.9	656.2
Deferred tax assets, net of valuation allowance	107.1	133.1
Deferred tax liabilities		
Property, plant and equipment	7.1	3.7
Goodwill and other intangibles	179.7	190.6
Other liabilities	—	18.4
Total deferred tax liabilities	186.8	212.7
Net deferred tax liabilities	$ 79.7	$ 79.6

Included in tax loss and credit carryforwards in the table above is a deferred tax asset of $29.6 million as of December 31, 2018 related to foreign tax credit carryover from the tax period ended December 31, 2017 and related to transition taxes. The entire amount is subject to a valuation allowance. The foreign tax credit is eligible for carryforward until the tax period ending December 31, 2027.

As of December 31, 2018 , tax loss carryforwards of $2,911.9 million were available to offset future income. A valuation allowance of $692.3 million exists for deferred income tax benefits related to the tax loss carryforwards which may not be realized. The increase in tax loss carryforwards and valuation allowance from 2017 to 2018 were primarily related to internal restructuring transactions. We believe sufficient taxable income will be generated in the respective jurisdictions to allow us to fully recover the remainder of the tax losses. The tax losses primarily relate to non-U.S. carryforwards of $2,818.2 million which are subject to varying expiration periods. Non-U.S. carryforwards of $2,345.7 million are located in jurisdictions with unlimited tax loss carryforward periods, while the remainder will begin to expire in 2019 . In addition, there were $93.7 million of state tax loss carryforwards as of December 31, 2018 . State tax losses of $56.1 million are in jurisdictions with unlimited tax loss carryforward periods, while the remainder will expire in future years through 2038.

U.S. tax reform
On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (the "Act") was signed into law making significant changes to the Internal Revenue Code. Changes include, but are not limited to, a corporate tax rate decrease from 35% to 21% effective for tax years beginning after December 31, 2017, the transition of U.S international taxation from a worldwide tax system to a territorial system, and a one-time transition tax on the mandatory deemed repatriation of cumulative foreign earnings as of December 31, 2017. For 2018, the Company considered in its annual effective tax rate additional provisions of the Act including changes to the deduction for executive compensation and interest expense, a tax on global intangible low-taxed income provisions ("GILTI"), the base erosion anti-abuse tax, and a deduction for foreign-derived intangible income. The Company has elected to treat tax on GILTI income as a period cost and has therefore included it in its annual effective tax rate.

Given the significance of the Act, Staff Accounting Bulletin No. 118 ("SAB 118") was issued to address the application of U.S. GAAP in situations when a registrant does not have the necessary information available, prepared, or analyzed (including

computations) in reasonable detail to complete the accounting for certain income tax effects of the Act. SAB 118 allows registrants to record provisional amounts during a one year "measurement period." The measurement period is deemed to have ended earlier when the registrant has obtained, prepared, and analyzed the information necessary to finalize its accounting. During the measurement period, impacts of the law are expected to be recorded at the time a reasonable estimate for all or a portion of the effects can be made, and provisional amounts can be recognized and adjusted as information becomes available, prepared, or analyzed.

The Company calculated its best estimate of the impact of the Act in its December 31, 2017 income tax provision in accordance with its understanding of the Act and guidance available as of the date of the filing of the 2017 Annual Report on Form 10-K and as a result recorded a provisional income tax expense of $2.2 million in the fourth quarter of 2017, the period in which the legislation was enacted. We subsequently recorded a $3.6 million decrease to the provisional income tax expense in the third quarter of 2018, resulting in a $1.4 million net decrease to income tax expense as a result of the Act.

The amount related to the remeasurement of certain deferred tax assets and liabilities based on the rates at which they are expected to reverse in the future was a decrease to income tax expense of $28.0 million . The amount related to the one-time transition tax on the mandatory deemed repatriation of foreign earnings was an increase to income tax expense of $26.6 million . No additional income taxes have been provided for any remaining undistributed foreign earnings not subject to the transition tax, or any additional outside basis difference inherent in these entities, as these amounts continue to be indefinitely reinvested in foreign operations.

11. Benefit Plans

Pension and other post-retirement plans

We sponsor U.S. and non-U.S. defined-benefit pension and other post-retirement plans. Pension benefits are based principally on an employee's years of service and/or compensation levels near retirement. In addition, we provide certain post-retirement health care and life insurance benefits. Generally, the post-retirement health care and life insurance plans require contributions from retirees.

In November 2017, our Board of Directors authorized the termination of the Pentair Salaried Plan (the "Salaried Plan"), a U.S. qualified pension plan, effective December 31, 2017. The Salaried Plan participants will not be adversely affected by the plan termination. Those participants whose plan benefits were not in pay status as of July 1, 2018 were given the opportunity to elect a lump sum (or monthly annuity) payment during a special election window. Payments of $171.9 million were made to participants who elected to receive a lump sum during this window. For all participants whose Salaried Plan benefits were not paid in lump sum, the Company will purchase an annuity for them with an annuity provider within 120 days after all required government approvals for the Salaried Plan termination have been received. The termination is expected to be completed in 2019.

At December 31, 2018 , the projected benefit obligation of the Salaried Plan was $175.9 million and the plan assets were $153.7 million . Due to the changing nature of these assumptions, it is at least reasonably possible that changes in these assumptions will occur in the near term and, due to the uncertainties inherent in setting assumptions, that the effect of such changes could be material to the financial statements.

As described in Note 1, during the first quarter of 2018, the Company adopted ASU 2017-07. As a result, service costs are classified as employee compensation costs within *Cost of goods sold* and *Selling, general and administrative expense* within the Consolidated Statements of Operations and Comprehensive Income. All other components of net periodic benefit expense are classified within *Other (income) expense* for the periods presented.

The information herein relates to defined-benefit pension and other post-retirement plans of our continuing operations only.

Obligations and funded status

The following tables present reconciliations of plan benefit obligations, fair value of plan assets and the funded status of pension plans and other post-retirement plans as of and for the years ended December 31, 2018 and 2017 :

	Pension plans		Other post-retirement plans	
In millions	**2018**	**2017**	**2018**	**2017**
Change in benefit obligations				
Benefit obligation beginning of year	$ 473.8	$ 423.8	$ 17.5	$ 18.9
Service cost	4.1	11.7	—	—
Interest cost	11.5	16.4	0.6	0.7
Actuarial loss (gain)	(23.6)	41.4	(1.4)	(0.1)
Foreign currency translation	(0.2)	0.6	—	—
Benefits paid	(187.7)	(20.1)	(1.8)	(2.0)
Benefit obligation end of year	$ 277.9	$ 473.8	$ 14.9	$ 17.5
Change in plan assets				
Fair value of plan assets beginning of year	$ 382.8	$ 352.3	$ —	$ —
Actual return on plan assets	(21.4)	42.4	—	—
Company contributions	7.1	6.3	1.8	2.0
Foreign currency translation	(0.1)	1.9	—	—
Benefits paid	(187.7)	(20.1)	(1.8)	(2.0)
Fair value of plan assets end of year	$ 180.7	$ 382.8	$ —	$ —
Funded status				
Benefit obligations in excess of the fair value of plan assets	$ (97.2)	$ (91.0)	$ (14.9)	$ (17.5)

Amounts recorded in the Consolidated Balance Sheets were as follows:

	Pension plans		Other post-retirement plans	
In millions	**2018**	**2017**	**2018**	**2017**
Current liabilities	$ (28.3)	$ (6.1)	$ (1.7)	$ (1.9)
Non-current liabilities	(68.9)	(84.9)	(13.2)	(15.6)
Benefit obligations in excess of the fair value of plan assets	$ (97.2)	$ (91.0)	$ (14.9)	$ (17.5)

The accumulated benefit obligation for all defined benefit plans was $275.0 million and $470.4 million at December 31, 2018 and 2017 , respectively.

Information for pension plans with an accumulated benefit obligation or projected benefit obligation in excess of plan assets as of December 31 was as follows:

	Projected benefit obligation exceeds the fair value of plan assets		Accumulated benefit obligation exceeds the fair value of plan assets	
In millions	**2018**	**2017**	**2018**	**2017**
Projected benefit obligation	$ 277.9	$ 473.8	$ 270.6	$ 464.9
Fair value of plan assets	180.7	382.8	173.7	374.5
Accumulated benefit obligation	N/A	N/A	268.3	462.3

Components of net periodic benefit expense for our pension plans for the years ended December 31 were as follows:

In millions	2018	2017	2016
Service cost	$ 4.1	$ 11.7	$ 12.8
Interest cost	11.5	16.4	16.5
Expected return on plan assets	(7.6)	(11.6)	(11.5)
Net actuarial loss (gain)	5.2	8.4	(11.5)
Net periodic benefit expense	$ 13.2	$ 24.9	$ 6.3

Components of net periodic benefit expense for our other post-retirement plans for the years ended December 31 2018 , 2017 and 2016 , were not material.

Assumptions
The following table provides the weighted-average assumptions used to determine benefit obligations and net periodic benefit cost as they pertain to our pension and other post-retirement plans.

	Pension plans			Other post-retirement plans		
	2018	2017	2016	2018	2017	2016
Benefit obligation assumptions [1]						
Discount rate	3.73%	4.00%	3.92%	3.95%	3.40%	3.80%
Rate of compensation increase	3.77%	3.96%	3.95%	NA	NA	NA
Net periodic benefit expense assumptions						
Discount rate	4.00%	3.94%	4.12%	3.40%	3.80%	3.95%
Expected long-term return on plan assets	4.17%	4.05%	4.19%	NA	NA	NA
Rate of compensation increase	3.96%	3.96%	3.93%	NA	NA	NA

(1) The benefit obligation for the Salaried Plan as of December 31, 2018 and 2017 were determined using assumptions reflecting the termination of the plan. As a result, the weighted-average assumptions for the pension plans reflected in the table above do not include the Salaried Plan.

Discount rates
The discount rate reflects the current rate at which the pension liabilities could be effectively settled at the end of the year based on our December 31 measurement date. The discount rate was determined by matching our expected benefit payments to payments from a stream of bonds rated AA or higher available in the marketplace, adjusted to eliminate the effects of call provisions. There are no known or anticipated changes in our discount rate assumptions that will impact our pension expense in 2019 .

Expected rates of return
The expected rate of return is designed to be a long-term assumption that may be subject to considerable year-to-year variance from actual returns. In developing the expected long-term rate of return, we considered our historical returns, with consideration given to forecasted economic conditions, our asset allocations, input from external consultants and broader long-term market indices. Pension plan assets yielded returns of (5.60)% , 12.00% and 7.40% in 2018 , 2017 and 2016 , respectively. As a result of our de-risking strategy to reduce U.S. pension plan liability, we anticipate the expected rate of return on our funded pension plans will continue to be consistent with the discount rate utilized. Any difference in the expected rate and actual returns will be included with the actuarial gain or loss recorded in the fourth quarter when our plans are remeasured.

Healthcare cost trend rates
The assumed healthcare cost trend rates for other post-retirement plans as of December 31 were as follows:

	2018	2017
Healthcare cost trend rate assumed for following year	6.2%	6.6%
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	4.4%	4.4%
Year the cost trend rate reaches the ultimate trend rate	2038	2038

The assumed healthcare cost trend rates can have a significant effect on the amounts reported for healthcare plans. A one-percentage-point change in the assumed healthcare cost trend rates would have the following effects as of and for the year ended December 31, 2018 :

	One Percentage Point	
In millions	**Increase**	**Decrease**
Increase (decrease) in annual service and interest cost	$ —	$ —
Increase (decrease) in other post-retirement benefit obligations	0.6	(0.5)

Pension plans assets

Objective

The primary objective of our investment strategy is to meet the pension obligation to our employees at a reasonable cost to us. This is primarily accomplished through growth of capital and safety of the funds invested.

Asset allocation

Our actual overall asset allocation for our pension plans as compared to our investment policy goals as of December 31 was as follows:

	Actual		Target	
	2018	**2017**	**2018**	**2017**
Fixed income	87%	98%	95%	97%
Alternative	5%	2%	5%	3%
Cash	8%	—%	—%	—%

Fair value measurement

The fair values of our pension plan assets and their respective levels in the fair value hierarchy as of December 31, 2018 and December 31, 2017 were as follows:

	December 31, 2018			
In millions	**Level 1**	**Level 2**	**Level 3**	**Total**
Cash and cash equivalents	$ —	$ 12.0	$ —	$ 12.0
Fixed income:				
Corporate and non U.S. government	—	102.3	—	102.3
U.S. treasuries	—	18.7	—	18.7
Other	—	16.5	—	16.5
Other investments	—	—	9.3	9.3
Total investments at fair value	$ —	$ 149.5	$ 9.3	$ 158.8
Investments measured at NAV				21.9
Total				$ 180.7

	December 31, 2017			
In millions	**Level 1**	**Level 2**	**Level 3**	**Total**
Fixed income:				
Corporate and non U.S. government	$ —	$ 262.8	$ —	$ 262.8
U.S. treasuries	—	43.2	—	43.2
Mortgage-backed securities	—	3.3	—	3.3
Other	—	37.0	—	37.0
Other investments	—	—	9.4	9.4
Total investments at fair value	$ —	$ 346.3	$ 9.4	$ 355.7
Investments measured at NAV				27.1
Total				$ 382.8

Valuation methodologies used for investments measured at fair value were as follows:

- ***Cash and cash equivalents:*** Cash consists of cash held in bank accounts and is considered a Level 1 investment. Cash equivalents consist of investments in commingled funds valued based on observable market data. Such investments were classified as Level 2.
- ***Fixed income:*** Investments in corporate bonds, government securities, mortgages and asset backed securities were valued based upon quoted market prices for similar securities and other observable market data. Investments in commingled funds were generally valued at the end of the period based upon the value of the underlying investments as determined by quoted market prices or by a pricing service. Such investments were classified as Level 2.
- ***Other investments:*** Other investments include investments in commingled funds with diversified investment strategies. Investments in commingled funds that were valued at the end of the period based upon the value of the underlying investments as determined by quoted market prices or by a pricing service were classified as Level 2. Investments in commingled funds that were valued based on unobservable inputs due to liquidation restrictions were classified as Level 3.

Activity for our Level 3 pension plan assets held during the years ended December 31, 2018 and 2017 was not material.

Cash flows

Contributions

Pension contributions from continuing operations totaled $7.1 million and $6.3 million in 2018 and 2017 , respectively. We anticipate our 2019 pension contributions to be approximately $29.9 million , which includes the planned termination of the Salaried Plan. The changing nature of the termination assumptions used to value the Salaried Plan may cause 2019 pension contributions to be higher or lower than expected. The 2019 expected contributions will equal or exceed our minimum funding requirements.

Estimated future benefit payments

The following benefit payments, which reflect expected future service or payout from termination, as appropriate, are expected to be paid by the plans for the years ended December 31 as follows:

In millions	**Pension Plans**	**Other post-retirement plans**
2019	$ 183.0	$ 1.7
2020	7.2	1.6
2021	7.2	1.6
2022	7.3	1.5
2023	6.8	1.4
Thereafter	36.2	5.4

Savings plan

We have a 401(k) plan (the “401(k) plan”) with an employee share ownership (“ESOP”) bonus component, which covers certain union and all non-union U.S. employees who met certain age requirements. Under the 401(k) plan, eligible U.S. employees could voluntarily contribute a percentage of their eligible compensation. We match contributions made by employees who met certain eligibility and service requirements.

As of January 1, 2018, the 401(k) company match contribution was changed to a dollar-for-dollar (100%) matching contribution on up to 5% of employee eligible earnings, contributed as before-tax contributions. This change replaced the ESOP component discussed below and offers the same 5% total company match.

During 2017 and 2016, the 401(k) matching contribution was 100% of eligible employee contributions for the first 1% of eligible compensation and 50% of the next 5% of eligible compensation.

During 2018, 2017 and 2016, in addition to the matching contribution, all employees who met certain service requirements received a discretionary ESOP contribution equal to 1.5% of annual eligible compensation.

Our combined expense for the 401(k) plan and the ESOP was $23.4 million , $27.9 million and $27.1 million in 2018 , 2017 and 2016 , respectively.

Other retirement compensation
Total other accrued retirement compensation, primarily related to deferred compensation and supplemental retirement plans, was $28.2 million and $29.6 million as of December 31, 2018 and 2017 , respectively, and is included in *Pension and other post-retirement compensation and benefits* and *Other non-current liabilities* in the Consolidated Balance Sheets.

12. Shareholders' Equity

Authorized shares
Our authorized share capital consists of 426.0 million ordinary shares with a par value of $0.01 per share.

Share repurchases
In December 2014, the Board of Directors authorized the repurchase of our ordinary shares up to a maximum dollar limit of $1.0 billion (the "2014 Authorization). On May 8, 2018, the Board of Directors authorized the repurchase of our ordinary shares up to a maximum dollar limit of $750.0 million (the "2018 Authorization"), replacing the 2014 Authorization. The 2018 Authorization expires on May 31, 2021 .

During the year ended December 31, 2017 , we repurchased 3.0 million of our ordinary shares for $200.0 million under the 2014 Authorization.

During the year ended December 31, 2018 , we repurchased 10.2 million of our shares for $500.0 million , of which 2.2 million shares, or $150.0 million , and 8.0 million shares, or $350.0 million , were repurchased pursuant to the 2014 and 2018 Authorizations, respectively.

As of December 31, 2018 , we had $400.0 million available for share repurchases under the 2018 Authorization.

Dividends payable
On December 10, 2018, the Board of Directors declared a quarterly cash dividend of $0.18 that was paid on February 8, 2019 to shareholders of record at the close of business on January 25, 2019. Additionally, the Board of Directors approved a plan to pay an annual cash dividend of $0.72 in 2019. As a result, the balance of dividends payable included in *Other current liabilities* on our Consolidated Balance Sheets was $30.8 million at December 31, 2018 . Dividends paid per ordinary share were $1.05 , $1.38 and $1.34 for the years ended December 31, 2018 , 2017 and 2016 , respectively.

13. Share Plans

Share-based compensation expense
Total share-based compensation expense for 2018 , 2017 and 2016 was as follows:

	December 31		
In millions	**2018**	**2017**	**2016**
Restricted stock units	$ 8.9	$ 17.5	$ 17.3
Stock options	4.6	10.5	10.4
Performance share units	7.4	11.6	6.5
Total share-based compensation expense	$ 20.9	$ 39.6	$ 34.2

Of the total share-based compensation expense noted above, $3.4 million , $7.6 million and $11.5 million for the years ended December 31, 2018 , 2017 and 2016 , respectively, was reported as part of *Income from discontinued operations, net of tax.*

Share incentive plans
In 2012, our Board of Directors, and Tyco International Ltd. ("Tyco") as our sole shareholder at the time, approved the Pentair plc 2012 Stock and Incentive Plan (the "2012 Plan"). The 2012 Plan became effective on September 28, 2012 and authorizes the issuance of 9.0 million of our ordinary shares. The shares may be issued as new shares or from shares held in treasury. Our practice is to settle equity-based awards by issuing new shares. The 2012 Plan terminates in September 2022. The 2012 Plan allows for the granting to our officers, directors, employees and consultants of non-qualified stock options, incentive stock options, stock appreciation rights, performance shares, performance units, restricted shares, restricted stock units, deferred stock rights, annual incentive awards, dividend equivalent units and other equity-based awards.

The 2012 Plan is administered by our compensation committee (the "Committee"), which is made up of independent members of our Board of Directors. Employees eligible to receive awards under the 2012 Plan are managerial, administrative or other key employees who are in a position to make a material contribution to the continued profitable growth and long-term success of our company. The Committee has the authority to select the recipients of awards, determine the type and size of awards, establish certain terms and conditions of award grants and take certain other actions as permitted under the 2012 Plan. The 2012 Plan prohibits the Committee from re-pricing awards or canceling and reissuing awards at lower prices.

Non-qualified and incentive stock options
Under the 2012 Plan, we may grant stock options to any eligible employee with an exercise price equal to the market value of the shares on the dates the options were granted. Options generally vest one-third each year over a three -year period commencing on the grant date and expire 10 years after the grant date.

Restricted shares and restricted stock units
Under the 2012 Plan, eligible employees may be awarded restricted shares or restricted stock units of our common stock. Restricted shares and restricted stock units generally vest one-third each year over a three -year period commencing on the grant date, subject to continuous employment and certain other conditions. Restricted shares and restricted stock units are valued at market value on the date of grant and are expensed over the vesting period.

Stock appreciation rights, performance shares and performance units
Under the 2012 Plan, the Committee is permitted to issue these awards which are generally earned over a three -year vesting period and tied to specific financial metrics. In December 2015, the Committee approved the granting of PSUs to certain employees that vest based on the satisfaction of a three -year service period and the achievement of certain performance metrics over that same period. Upon vesting, PSU holders receive dividends that accumulate during the vesting period. The fair value of these PSUs is determined based on the closing market price of the Company's ordinary shares at the date of grant. Compensation expense is recognized over the period an employee is required to provide service based on the estimated vesting of the PSUs granted. The estimated vesting of the PSUs is based on the probability of achieving certain financial performance metrics during the three year vesting period.

Stock options
The following table summarizes stock option activity under all plans for the year ended December 31, 2018 :

Shares and intrinsic value in millions	**Number of shares**	**Weighted-average exercise price**	**Weighted-average remaining contractual life (years)**	**Aggregate intrinsic value**
Outstanding as of January 1, 2018	5.2	$ 28.80		
Granted	0.5	45.42		
Exercised	(0.8)	23.52		
Forfeited	(0.1)	43.77		
Spin-off adjustment	(0.7)	—		
Outstanding as of December 31, 2018	4.1	$ 35.77	5.2	$ 20.6
Options exercisable as of December 31, 2018	3.0	$ 33.93	4.0	$ 19.5
Options expected to vest as of December 31, 2018	1.1	$ 40.55	8.2	$ 1.2

Fair value of options granted
The weighted average grant date fair value of options granted under Pentair plans in 2018 , 2017 and 2016 was estimated to be $10.92 , $12.59 and $9.74 per share, respectively. The total intrinsic value of options that were exercised during 2018 , 2017 and 2016 was $18.2 million , $34.3 million and $27.1 million , respectively. At December 31, 2018 , the total unrecognized compensation cost related to stock options was $7.8 million . This cost is expected to be recognized over a weighted average period of 2.1 years.

We estimated the fair value of each stock option award on the date of grant using a Black-Scholes option pricing model, modified for dividends and using the following weighted average assumptions:

	December 31		
	2018	**2017**	**2016**
Risk-free interest rate	2.58%	1.65%	1.56%
Expected dividend yield	1.56%	2.35%	2.49%
Expected share price volatility	24.8%	26.9%	27.3%
Expected term (years)	6.1	6.3	5.9

These estimates require us to make assumptions based on historical results, observance of trends in our share price, changes in option exercise behavior, future expectations and other relevant factors. If other assumptions had been used, share-based compensation expense, as calculated and recorded under the accounting guidance, could have been affected.

We based the expected life assumption on historical experience as well as the terms and vesting periods of the options granted. For purposes of determining expected volatility, we considered a rolling average of historical volatility measured over a period approximately equal to the expected option term. The risk-free rate for periods that coincide with the expected life of the options is based on the U.S. Treasury Department yield curve in effect at the time of grant.

Cash received from option exercises for the years ended December 31, 2018 , 2017 and 2016 was $19.5 million , $46.0 million and $31.6 million , respectively. The actual tax benefit realized for the tax deductions from option exercised totaled $5.6 million , $7.8 million and $5.5 million for the years ended December 31, 2018 , 2017 and 2016 , respectively.

Restricted stock units

The following table summarizes restricted stock unit activity under all plans for the year ended December 31, 2018 :

Shares in millions	**Number of shares**	**Weighted average grant date fair value**
Outstanding as of January 1, 2018	0.6	$ 39.44
Granted	0.2	45.46
Vested	(0.6)	43.89
Conversion of PSUs	0.5	—
Spin-off adjustment	(0.2)	—
Outstanding as of December 31, 2018	0.5	$ 41.74

As of December 31, 2018 , there was $18.4 million of unrecognized compensation cost related to restricted share compensation arrangements granted under the 2012 Plan and previous plans. That cost is expected to be recognized over a weighted-average period of 1.0 years. The total fair value of shares vested during the years ended December 31, 2018 , 2017 and 2016 , was $24.4 million , $21.7 million and $27.2 million , respectively. The actual tax benefit realized for the year ended December 31, 2018 was $0.7 million . There were no actual tax benefits realized for the years ended December 31, 2017 and 2016 .

Performance share units

The following table summarizes performance share unit activity under all plans for the year ended December 31, 2018 :

Shares in millions	**Number of shares**	**Weighted average grant date fair value**
Outstanding as of January 1, 2018	0.5	$ 29.53
Granted	0.1	45.42
Conversion to RSUs	(0.5)	—
Outstanding as of December 31, 2018	0.1	$ 45.42

The expense recognized each period is dependent upon our estimate of the number of shares that will ultimately be issued. As of December 31, 2018 , there was $4.3 million of unrecognized compensation cost related to performance share compensation arrangements granted under the 2012 Plan and previous plans. That cost is expected to be recognized over a weighted-average period of 2.2 years. The actual tax benefit realized for the year ended December 31, 2018 was $0.2 million . There were no actual tax benefits realized for the years ended December 31, 2017 and 2016 .

Electrical separation
In connection with the Separation and Distribution, the Company adjusted its outstanding equity awards on May 1, 2018 in accordance with the Employee Matters Agreement between Pentair and nVent. The outstanding awards will continue to vest over the original vesting period, which is generally three years from the grant date.

The RSUs, PSUs, and stock option awards issued before May 9, 2017 (the date of Pentair's announcement of its intention to separate its Water and Electrical businesses) were converted into awards of both Pentair and nVent regardless of which company the award holder was employed by immediately after the Separation. These awards were converted as follows:

- *Restricted stock units* : For every unvested Pentair RSU award held, the holder received one nVent RSU.

- *Performance share units* : Pentair PSUs were converted to Pentair RSUs immediately after the Distribution. The PSUs granted in 2016 were converted at rate of 125% of target, and the PSUs granted in 2017 were converted at a rate of 100% of target. For every converted RSU, the shareholder also received one nVent RSU. The converted RSUs retain the original vesting schedule of the awarded PSUs.

- *Stock options:* Every holder of unexercised (vested and unvested) Pentair stock options received both adjusted stock options of Pentair and stock options of nVent, with the number of underlying shares and the exercise price adjusted accordingly to preserve the overall intrinsic value of the awards. The number of Pentair stock options was converted based upon the ratio of Pentair's pre-Distribution stock price divided by the sum of the Pentair and nVent post-Distribution closing prices. The exercise price for the converted Pentair stock options was adjusted based on the Pentair post-Distribution closing price divided by the Pentair pre-Distribution closing price.

  The number of new nVent stock options awarded is the same as the converted number of Pentair stock options calculated as described above. The exercise price for the new nVent stock options was calculated based on nVent's post-Distribution closing price divided by the Pentair pre-Distribution closing price.

Generally, unvested awards issued after May 9, 2017 were converted to awards of the Company that the shareholder was employed by immediately after the Separation, with adjustments to the number of underlying shares as appropriate to preserve the intrinsic value of such awards immediately prior to the Distribution. The adjustment of the underlying shares was based on the ratio of Pentair's pre-Distribution stock price divided by the post-Distribution closing price of the respective company's ordinary shares. The exercise prices of the stock options were converted using the inverse ratio in a manner designed to preserve the intrinsic value of such awards.

14. Segment Information
Effective May 1, 2018, we reorganized our business segments to reflect a new operating structure, resulting in a change to our reporting segments. All prior period amounts related to the segment change have been retrospectively reclassified to conform to the new presentation. As part of this reorganization the legacy Water segment was separated into three reportable business segments:

- ***Aquatic Systems*** — This segment manufactures and sells a complete line of energy-efficient residential and commercial pool equipment and accessories including pumps, filters, heaters, lights, automatic controls, automatic cleaners, maintenance equipment and pool accessories. Applications for our Aquatic Systems products include residential and commercial pool maintenance, pool repair, renovation, service and construction and aquaculture solutions.

- ***Filtration Solutions*** — This segment manufactures and sells water and fluid treatment products and systems, including pressure tanks and vessels, control valves, activated carbon products, conventional filtration products, point-of-entry and point-of-use systems, gas recovery solutions, membrane bioreactors, wastewater reuse systems and advanced membrane filtration and separation systems into the global residential, industrial and commercial markets. These products are used in a range of applications, including use in fluid filtration, ion exchange, desalination, food and beverage, food service and separation technologies for the oil and gas industry.

- ***Flow Technologies*** — This segment manufactures and sells products ranging from light duty diaphragm pumps to high-flow turbine pumps and solid handling pumps while serving the global residential, commercial and industrial markets. These pumps are used in a range of applications, including residential and municipal wells, water treatment, wastewater solids handling, pressure boosting, fluid delivery, circulation and transfer, fire suppression, flood control, agricultural irrigation and crop spray.

We evaluate performance based on net sales and segment income (loss) and use a variety of ratios to measure performance of our reporting segments. These results are not necessarily indicative of the results of operations that would have occurred had each segment been an independent, stand-alone entity during the periods presented. Segment income (loss) represents equity income of unconsolidated subsidiaries and operating income exclusive of intangible amortization, certain acquisition related expenses, costs of restructuring activities, impairments and other unusual non-operating items.

Financial information by reportable segment is included in the following summary:

	2018	2017	2016	2018	2017	2016
In millions	Net sales			Segment income (loss)		
Aquatic Systems	$ 1,026.1	$ 939.6	$ 877.8	$ 277.6	$ 254.1	$ 217.4
Filtration Solutions	1,001.0	990.6	976.3	168.5	154.5	138.4
Flow Technologies	936.7	914.2	923.5	145.6	140.6	141.6
Other	1.3	1.3	3.0	(54.9)	(52.7)	(56.0)
Consolidated [1]	$ 2,965.1	$ 2,845.7	$ 2,780.6	$ 536.8	$ 496.5	$ 441.4

[1] One customer in the Aquatic Systems segment, Pool Corporation, represented approximately 15% of our consolidated net sales in 2018 , 2017 and 2016 .

	2018	2017	2016	2018	2017	2016	2018	2017	2016
In millions	Identifiable assets [1]			Capital expenditures			Depreciation		
Aquatic Systems	$ 1,304.2	$ 1,323.0	$ 1,238.0	$ 10.6	$ 9.6	$ 12.0	$ 8.1	$ 10.6	$ 9.8
Filtration Solutions	1,232.4	1,333.3	1,362.4	16.6	19.2	17.8	23.2	21.6	23.7
Flow Technologies	1,003.6	1,010.8	865.2	10.3	7.3	11.0	13.1	13.4	13.3
Other	266.3	4,966.6	8,069.2	10.7	3.0	2.5	5.3	5.2	6.2
Consolidated	$ 3,806.5	$ 8,633.7	$ 11,534.8	$ 48.2	$ 39.1	$ 43.3	$ 49.7	$ 50.8	$ 53.0

[1] All cash and cash equivalents and assets held for sale are included in “Other.”

The following table presents a reconciliation of consolidated segment income to consolidated income from continuing operations before income taxes:

In millions	2018	2017	2016
Segment income	$ 536.8	$ 496.5	$ 441.4
Restructuring and other	(31.8)	(28.2)	(7.8)
Intangible amortization	(34.9)	(36.4)	(35.4)
Pension and other post-retirement mark-to-market (loss) gain	(3.6)	(8.5)	12.0
Trade name and other impairment	(12.0)	(15.6)	—
Loss on sale of businesses	(7.3)	(4.2)	(3.9)
Loss on early extinguishment of debt	(17.1)	(101.4)	—
Interest expense, net	(32.6)	(87.3)	(140.1)
Corporate allocations	(11.0)	(36.7)	(39.4)
Deal related costs and expenses	(2.0)	—	—
Other expense	(4.7)	(5.4)	(5.9)
Income from continuing operations before income taxes	$ 379.8	$ 172.8	$ 220.9

15. Commitments and Contingencies

Operating lease commitments

Net rental expense under operating leases was as follows:

	Years ended December 31		
In millions	**2018**	**2017**	**2016**
Gross rental expense	$ 30.4	$ 29.7	$ 29.0
Sublease rental income	(0.4)	(0.2)	(0.5)
Net rental expense	$ 30.0	$ 29.5	$ 28.5

Future minimum lease commitments under non-cancelable operating leases, principally related to facilities, machinery, equipment and vehicles as of December 31, 2018 were as follows:

In millions	**2019**	**2020**	**2021**	**2022**	**2023**	**Thereafter**	**Total**
Minimum lease payments	$ 23.2	$ 17.6	$ 13.3	$ 11.1	$ 9.5	$ 13.8	$ 88.5
Minimum sublease rentals	(0.7)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(3.7)
Net future minimum lease commitments	$ 22.5	$ 17.0	$ 12.7	$ 10.5	$ 8.9	$ 13.2	$ 84.8

Other matters

In addition to the matters described above, from time to time, we are subject to disputes, administrative proceedings and other claims relating to the conduct of our business. These matters include, without limitation, claims relating to commercial or contractual disputes with suppliers, customers or parties to acquisitions and divestitures, intellectual property matters, environmental, safety and health matters, product liability, the use or installation of our products, consumer matters, and employment and labor matters. On the basis of information currently available to it, management does not believe that existing proceedings and claims will have a material impact on our Consolidated Financial Statements. However, litigation is unpredictable, and we could incur judgments or enter into settlements for current or future claims that could adversely affect our financial statements.

Warranties and guarantees

In connection with the disposition of our businesses or product lines, we may agree to indemnify purchasers for various potential liabilities relating to the sold business, such as pre-closing tax, product liability, warranty, environmental, or other obligations. The subject matter, amounts and duration of any such indemnification obligations vary for each type of liability indemnified and may vary widely from transaction to transaction.

Generally, the maximum obligation under such indemnifications is not explicitly stated and as a result, the overall amount of these obligations cannot be reasonably estimated. Historically, we have not made significant payments for these indemnifications. We believe that if we were to incur a loss in any of these matters, the loss would not have a material effect on our financial position, results of operations or cash flows.

We recognize, at the inception of a guarantee, a liability for the fair value of the obligation undertaken in issuing the guarantee. In connection with the disposition of the Valves & Controls business, we agreed to indemnify Emerson Electric Co. for certain pre-closing tax liabilities. In 2017, we recorded a liability representing the fair value of our expected future obligation for this matter.

We provide service and warranty policies on our products. Liability under service and warranty policies is based upon a review of historical warranty and service claim experience. Adjustments are made to accruals as claim data and historical experience warrant.

The changes in the carrying amount of service and product warranties for the years ended December 31, 2018 , 2017 and 2016 were as follows:

	Years ended December 31		
In millions	**2018**	**2017**	**2016**
Beginning balance	$ 38.1	$ 36.3	$ 44.6
Service and product warranty provision	50.8	60.8	55.2
Payments	(54.6)	(59.6)	(64.2)
Foreign currency translation	(0.4)	0.6	0.7
Ending balance	$ 33.9	$ 38.1	$ 36.3

Stand-by letters of credit, bank guarantees and bonds

In certain situations, Tyco guaranteed performance by the flow control business of Pentair Ltd. ("Flow Control") to third parties or provided financial guarantees for financial commitments of Flow Control. In situations where Flow Control and Tyco were unable to obtain a release from these guarantees in connection with the spin-off of Flow Control from Tyco, we will indemnify Tyco for any losses it suffers as a result of such guarantees.

In disposing of assets or businesses, we often provide representations, warranties and indemnities to cover various risks including unknown damage to the assets, environmental risks involved in the sale of real estate, liability to investigate and remediate environmental contamination at waste disposal sites and manufacturing facilities and unidentified tax liabilities and legal fees related to periods prior to disposition. We do not have the ability to reasonably estimate the potential liability due to the inchoate and unknown nature of these potential liabilities. However, we have no reason to believe that these uncertainties would have a material adverse effect on our financial position, results of operations or cash flows.

In the ordinary course of business, we are required to commit to bonds, letters of credit and bank guarantees that require payments to our customers for any non-performance. The outstanding face value of these instruments fluctuates with the value of our projects in process and in our backlog. In addition, we issue financial stand-by letters of credit primarily to secure our performance to third parties under self-insurance programs.

As of December 31, 2018 and 2017 , the outstanding value of bonds, letters of credit and bank guarantees totaled $123.6 million and $129.2 million , respectively.

16. Selected Quarterly Data (Unaudited)

The following tables present 2018 and 2017 quarterly financial information:

	2018				
In millions, except per-share data	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Full Year
Net sales	$ 732.6	$ 780.6	$ 711.4	$ 740.5	$ 2,965.1
Gross profit	253.3	282.6	243.8	268.0	1,047.7
Operating income	92.7	122.6	108.4	113.0	436.7
Net income from continuing operations	58.4	77.9 (1)	91.2	94.2	321.7
Income (loss) from discontinued operations, net of tax	44.5	(36.4)	18.9	(1.3)	25.7
Net income	102.9	41.5	110.1	92.9	347.4
Earnings (loss) per ordinary share (2)					
Basic					
Continuing operations	$ 0.33	$ 0.44	$ 0.52	$ 0.55	$ 1.83
Discontinued operations	0.24	(0.21)	0.11	(0.01)	0.15
Basic earnings per ordinary share	$ 0.57	$ 0.23	$ 0.63	$ 0.54	$ 1.98
Diluted					
Continuing operations	$ 0.32	$ 0.44	$ 0.52	$ 0.54	$ 1.81
Discontinued operations	0.25	(0.21)	0.11	(0.01)	0.15
Diluted earnings per ordinary share	$ 0.57	$ 0.23	$ 0.63	$ 0.53	$ 1.96

(1) Includes decrease of $17.1 million related to loss on early extinguishment of debt.
(2) Amounts may not total to annual earnings because each quarter and year are calculated separately based on basic and diluted weighted-average ordinary shares outstanding during that period.

	2017				
In millions, except per-share data	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Full Year
Net sales	$ 683.3	$ 754.0	$ 687.6	$ 720.8	$ 2,845.7
Gross profit	223.7	273.6	236.5	253.7	987.5
Operating income	61.9	129.2	101.8	85.4	378.3
Net income (loss) from continuing operations	12.7	(3.4) (1)	49.0	55.8 (2)	114.1
Income from discontinued operations, net of tax	75.0	66.5	78.2	151.6	371.3
Gain (loss) from sale of discontinued operations, net of tax	—	200.6	(1.7)	(17.8)	181.1
Net income	87.7	263.7	125.5	189.6	666.5
Earnings (loss) per ordinary share (3)					
Basic					
Continuing operations	$ 0.07	$ (0.02)	$ 0.27	$ 0.32	$ 0.63
Discontinued operations	0.41	1.47	0.42	0.73	3.04
Basic earnings per ordinary share	$ 0.48	$ 1.45	$ 0.69	$ 1.05	$ 3.67
Diluted					
Continuing operations	$ 0.07	$ (0.02)	$ 0.27	$ 0.30	$ 0.62
Discontinued operations	0.41	1.45	0.41	0.74	3.01
Diluted earnings per ordinary share	$ 0.48	$ 1.43	$ 0.68	$ 1.04	$ 3.63

(1) Includes decrease of $101.4 million related to loss on early extinguishment of debt.
(2) Includes decrease of $15.6 million due to trade name and other impairment and $8.5 million related to a “mark-to-market” actuarial loss on pension and other post-retirement benefit plans.
(3) Amounts may not total to annual earnings because each quarter and year are calculated separately based on basic and diluted weighted-average ordinary shares outstanding during that period.

17. Supplemental Guarantor Information

Pentair plc (the "Parent Company Guarantor") and Pentair Investments Switzerland GmbH (the "Subsidiary Guarantor"), fully and unconditionally, guarantee the Notes of Pentair Finance S.à r.l. (the "Subsidiary Issuer"). The Subsidiary Guarantor is a Switzerland limited liability company formed in April 2014 and 100 percent -owned subsidiary of the Parent Company Guarantor. The Subsidiary Issuer is a Luxembourg public limited liability company formed in January 2012 and 100 percent -owned subsidiary of the Subsidiary Guarantor. The guarantees provided by the Parent Company Guarantor and Subsidiary Guarantor are joint and several.

The following supplemental financial information sets forth the Company's Condensed Consolidating Statement of Operations and Comprehensive Income and Condensed Consolidating Statement of Cash Flows for the years ended December 31, 2018 , 2017 and 2016 and Condensed Consolidating Balance Sheet as of December 31, 2018 and 2017 . Condensed Consolidating financial information for Pentair plc, Pentair Investments Switzerland GmbH and Pentair Finance S.à r.l. on a stand-alone basis is presented using the equity method of accounting for subsidiaries.

Pentair plc and Subsidiaries
Condensed Consolidating Statement of Operations and Comprehensive Income (Loss)
Year Ended December 31, 2018

In millions	Parent Company Guarantor	Subsidiary Guarantor	Subsidiary Issuer	Non-guarantor Subsidiaries	Eliminations	Consolidated Total
Net sales	$ —	$ —	$ —	$ 2,965.1	$ —	$ 2,965.1
Cost of goods sold	—	—	—	1,917.4	—	1,917.4
Gross profit	—	—	—	1,047.7	—	1,047.7
Selling, general and administrative	11.8	0.9	1.2	520.4	—	534.3
Research and development	—	—	—	76.7	—	76.7
Operating (loss) income	(11.8)	(0.9)	(1.2)	450.6	—	436.7
Loss (earnings) from continuing operations of investment in subsidiaries	(333.5)	(333.4)	(376.5)	—	1,043.4	—
Other (income) expense:						
Loss on sale of businesses	—	—	—	7.3	—	7.3
Loss on early extinguishment of debt	—	—	17.1	—	—	17.1
Net interest (income) expense	—	(1.0)	24.8	8.8	—	32.6
Other income	—	—	—	(0.1)	—	(0.1)
Income (loss) from continuing operations before income taxes	321.7	333.5	333.4	434.6	(1,043.4)	379.8
Provision for income taxes	—	—	—	58.1	—	58.1
Net income (loss) from continuing operations	321.7	333.5	333.4	376.5	(1,043.4)	321.7
Income from discontinued operations, net of tax	—	—	—	25.7	—	25.7
Earnings (loss) from discontinued operations of investment in subsidiaries	25.7	25.7	25.7	—	(77.1)	—
Net income (loss)	$ 347.4	$ 359.2	$ 359.1	$ 402.2	$ (1,120.5)	$ 347.4
Comprehensive income (loss), net of tax						
Net income (loss)	$ 347.4	$ 359.2	$ 359.1	$ 402.2	$ (1,120.5)	$ 347.4
Changes in cumulative translation adjustment	10.0	10.0	10.0	10.0	(30.0)	10.0
Changes in market value of derivative financial instruments, net of tax	4.8	4.8	4.8	4.8	(14.4)	4.8
Comprehensive income (loss)	$ 362.2	$ 374.0	$ 373.9	$ 417.0	$ (1,164.9)	$ 362.2

Pentair plc and Subsidiaries
Condensed Consolidating Balance Sheet
December 31, 2018

In millions	Parent Company Guarantor	Subsidiary Guarantor	Subsidiary Issuer	Non-guarantor Subsidiaries	Eliminations	Consolidated Total
			Assets			
Current assets						
Cash and cash equivalents	$ 0.1	$ —	$ 0.1	$ 74.1	$ —	$ 74.3
Accounts and notes receivable, net	4.6	—	—	483.6	—	488.2
Inventories	—	—	—	387.5	—	387.5
Other current assets	3.4	—	2.2	99.2	(15.4)	89.4
Total current assets	8.1	—	2.3	1,044.4	(15.4)	1,039.4
Property, plant and equipment, net	—	—	—	272.6	—	272.6
Other assets						
Investments in subsidiaries	1,903.8	2,036.1	2,675.7	—	(6,615.6)	—
Goodwill	—	—	—	2,072.7	—	2,072.7
Intangibles, net	—	—	—	276.3	—	276.3
Other non-current assets	23.3	—	696.1	729.7	(1,303.6)	145.5
Total other assets	1,927.1	2,036.1	3,371.8	3,078.7	(7,919.2)	2,494.5
Total assets	$ 1,935.2	$ 2,036.1	$ 3,374.1	$ 4,395.7	$ (7,934.6)	$ 3,806.5
			Liabilities and Equity			
Current liabilities						
Accounts payable	$ 0.9	$ —	$ —	$ 377.7	$ —	$ 378.6
Employee compensation and benefits	0.2	—	—	111.5	—	111.7
Other current liabilities	47.6	1.5	4.4	290.3	(15.4)	328.4
Total current liabilities	48.7	1.5	4.4	779.5	(15.4)	818.7
Other liabilities						
Long-term debt	29.9	130.8	1,333.9	596.6	(1,303.6)	787.6
Pension and other post-retirement compensation and benefits	—	—	—	90.0	—	90.0
Deferred tax liabilities	—	—	—	105.9	—	105.9
Other non-current liabilities	20.5	—	—	147.7	—	168.2
Total liabilities	99.1	132.3	1,338.3	1,719.7	(1,319.0)	1,970.4
Equity	1,836.1	1,903.8	2,035.8	2,676.0	(6,615.6)	1,836.1
Total liabilities and equity	$ 1,935.2	$ 2,036.1	$ 3,374.1	$ 4,395.7	$ (7,934.6)	$ 3,806.5

Pentair plc and Subsidiaries
Condensed Consolidating Statement of Cash Flows
Year Ended December 31, 2018

In millions	Parent Company Guarantor	Subsidiary Guarantor	Subsidiary Issuer	Non-guarantor Subsidiaries	Eliminations	Consolidated Total
Operating activities						
Net cash provided by (used for) operating activities	$ 266.3	$ 362.1	$ 370.6	$ 637.7	$ (1,197.6)	$ 439.1
Investing activities						
Capital expenditures	—	—	—	(48.2)	—	(48.2)
Proceeds from sale of property and equipment	—	—	—	0.2	—	0.2
Payments due to sale of businesses and other	—	—	—	(12.8)	—	(12.8)
Acquisitions, net of cash acquired	—	—	—	(0.9)	—	(0.9)
Net intercompany loan activity	—	94.1	181.0	1,655.7	(1,930.8)	—
Net cash provided by (used for) investing activities of continuing operations	—	94.1	181.0	1,594.0	(1,930.8)	(61.7)
Net cash provided by (used for) investing activities of discontinued operations	—	—	—	(7.1)	—	(7.1)
Net cash provided by (used for) investing activities	—	94.1	181.0	1,586.9	(1,930.8)	(68.8)
Financing activities						
Net receipts (repayments) of commercial paper and revolving long-term debt	—	—	41.9	(2.2)	—	39.7
Repayment of long-term debt	—	—	(675.1)	—	—	(675.1)
Premium paid on early extinguishment of debt	—	—	(16.0)	—	—	(16.0)
Transfer of cash to nVent	—	—	—	(74.2)	—	(74.2)
Distribution of cash from nVent	—	—	993.6	—	—	993.6
Net change in advances to subsidiaries	407.7	(456.2)	(874.6)	(2,205.3)	3,128.4	—
Shares issued to employees, net of shares withheld	13.3	—	—	—	—	13.3
Repurchases of ordinary shares	(500.0)	—	—	—	—	(500.0)
Dividends paid	(187.2)	—	—	—	—	(187.2)
Other	—	—	(2.0)	—	—	(2.0)
Net cash provided by (used for) financing activities	(266.2)	(456.2)	(532.2)	(2,281.7)	3,128.4	(407.9)
Change in cash held for sale	—	—	—	27.0	—	27.0
Effect of exchange rate changes on cash and cash equivalents	—	—	(19.3)	17.9	—	(1.4)
Change in cash and cash equivalents	0.1	—	0.1	(12.2)	—	(12.0)
Cash and cash equivalents, beginning of year	—	—	—	86.3	—	86.3
Cash and cash equivalents, end of year	$ 0.1	$ —	$ 0.1	$ 74.1	$ —	$ 74.3

Pentair plc and Subsidiaries
Condensed Consolidating Statement of Operations and Comprehensive Income (Loss)
Year Ended December 31, 2017

In millions	Parent Company Guarantor	Subsidiary Guarantor	Subsidiary Issuer	Non-guarantor Subsidiaries	Eliminations	Consolidated Total
Net sales	$ —	$ —	$ —	$ 2,845.7	$ —	$ 2,845.7
Cost of goods sold	—	—	—	1,858.2	—	1,858.2
Gross profit	—	—	—	987.5	—	987.5
Selling, general and administrative	9.0	0.6	—	526.4	—	536.0
Research and development	—	—	—	73.2	—	73.2
Operating (loss) income	(9.0)	(0.6)	—	387.9	—	378.3
Loss (earnings) from continuing operations of investment in subsidiaries	(122.2)	(122.2)	(283.4)	—	527.8	—
Other (income) expense:						
Loss on sale of businesses	—	—	—	4.2	—	4.2
Loss on early extinguishment of debt	—	—	91.0	10.4	—	101.4
Net interest (income) expense	—	(0.6)	70.7	17.2	—	87.3
Other expense	—	—	—	12.6	—	12.6
Income (loss) from continuing operations before income taxes	113.2	122.2	121.7	343.5	(527.8)	172.8
Provision (benefit) for income taxes	(0.9)	—	—	59.6	—	58.7
Net income (loss) from continuing operations	114.1	122.2	121.7	283.9	(527.8)	114.1
Income from discontinued operations, net of tax	—	—	—	371.3	—	371.3
Gain from sale of discontinued operations, net of tax	—	—	—	181.1	—	181.1
Earnings (loss) from discontinued operations of investment in subsidiaries	552.4	552.4	552.4	—	(1,657.2)	—
Net income (loss)	$ 666.5	$ 674.6	$ 674.1	$ 836.3	$ (2,185.0)	$ 666.5
Comprehensive income (loss), net of tax						
Net income (loss)	$ 666.5	$ 674.6	$ 674.1	$ 836.3	$ (2,185.0)	$ 666.5
Changes in cumulative translation adjustment	497.5	497.5	497.5	497.5	(1,492.5)	497.5
Changes in market value of derivative financial instruments, net of tax	(4.6)	(4.6)	(4.6)	(4.6)	13.8	(4.6)
Comprehensive income (loss)	$ 1,159.4	$ 1,167.5	$ 1,167.0	$ 1,329.2	$ (3,663.7)	$ 1,159.4

Pentair plc and Subsidiaries
Condensed Consolidating Balance Sheet
December 31, 2017

In millions	Parent Company Guarantor	Subsidiary Guarantor	Subsidiary Issuer	Non-guarantor Subsidiaries	Eliminations	Consolidated Total
			Assets			
Current assets						
Cash and cash equivalents	$ —	$ —	$ —	$ 86.3	$ —	$ 86.3
Accounts and notes receivable, net	—	—	—	483.1	—	483.1
Inventories	—	—	—	356.9	—	356.9
Other current assets	10.8	1.8	1.5	109.6	(9.2)	114.5
Current assets held for sale	—	—	—	708.0	—	708.0
Total current assets	10.8	1.8	1.5	1,743.9	(9.2)	1,748.8
Property, plant and equipment, net	—	—	—	279.8	—	279.8
Other assets						
Investments in subsidiaries	5,205.1	5,109.6	7,156.1	—	(17,470.8)	—
Goodwill	—	—	—	2,112.8	—	2,112.8
Intangibles, net	—	—	—	321.8	—	321.8
Other non-current assets	2.2	94.1	614.0	1,360.0	(1,889.4)	180.9
Non-current assets held for sale	—	—	—	3,989.6	—	3,989.6
Total other assets	5,207.3	5,203.7	7,770.1	7,784.2	(19,360.2)	6,605.1
Total assets	$ 5,218.1	$ 5,205.5	$ 7,771.6	$ 9,807.9	$ (19,369.4)	$ 8,633.7
			Liabilities and Equity			
Current liabilities						
Accounts payable	$ 1.4	$ —	$ —	$ 320.1	$ —	$ 321.5
Employee compensation and benefits	0.4	—	—	115.4	—	115.8
Other current liabilities	99.6	0.4	9.4	301.1	(9.2)	401.3
Current liabilities held for sale	—	—	—	360.8	—	360.8
Total current liabilities	101.4	0.4	9.4	1,097.4	(9.2)	1,199.4
Other liabilities						
Long-term debt	48.4	—	2,652.8	628.9	(1,889.4)	1,440.7
Pension and other post-retirement compensation and benefits	—	—	—	96.4	—	96.4
Deferred tax liabilities	—	—	—	108.6	—	108.6
Other non-current liabilities	30.5	—	—	183.3	—	213.8
Non-current liabilities held for sale	—	—	—	537.0	—	537.0
Total liabilities	180.3	0.4	2,662.2	2,651.6	(1,898.6)	3,595.9
Equity	5,037.8	5,205.1	5,109.4	7,156.3	(17,470.8)	5,037.8
Total liabilities and equity	$ 5,218.1	$ 5,205.5	$ 7,771.6	$ 9,807.9	$ (19,369.4)	$ 8,633.7

Pentair plc and Subsidiaries
Condensed Consolidating Statement of Cash Flows
Year Ended December 31, 2017

In millions	Parent Company Guarantor	Subsidiary Guarantor	Subsidiary Issuer	Non-guarantor Subsidiaries	Eliminations	Consolidated Total
Operating activities						
Net cash provided by (used for) operating activities	$ 678.3	$ 676.1	$ 656.2	$ 794.6	$ (2,185.0)	$ 620.2
Investing activities						
Capital expenditures	—	—	—	(39.1)	—	(39.1)
Proceeds from sale of property and equipment	—	—	—	3.7	—	3.7
Proceeds from sale of businesses and other	—	—	2,765.6	(6.2)	—	2,759.4
Acquisitions, net of cash acquired	—	—	—	(45.9)	—	(45.9)
Net intercompany loan activity	—	(58.9)	103.7	172.5	(217.3)	—
Net cash provided by (used for) investing activities of continuing operations	—	(58.9)	2,869.3	85.0	(217.3)	2,678.1
Net cash provided by (used for) investing activities from discontinued operations	—	—	—	(47.7)	—	(47.7)
Net cash provided by (used for) investing activities	—	(58.9)	2,869.3	37.3	(217.3)	2,630.4
Financing activities						
Net receipts (repayments) of commercial paper and revolving long-term debt	—	—	(914.7)	1.6	—	(913.1)
Repayment of long-term debt	—	—	(1,917.8)	(91.5)	—	(2,009.3)
Premium paid on early extinguishment of debt	—	—	(86.0)	(8.9)	—	(94.9)
Net change in advances to subsidiaries	(263.8)	(617.2)	(680.8)	(840.5)	2,402.3	—
Shares issued to employees, net of shares withheld	37.2	—	—	—	—	37.2
Repurchases of ordinary shares	(200.0)	—	—	—	—	(200.0)
Dividends paid	(251.7)	—	—	—	—	(251.7)
Other	—	—	—	(0.8)	—	(0.8)
Net cash provided by (used for) financing activities	(678.3)	(617.2)	(3,599.3)	(940.1)	2,402.3	(3,432.6)
Change in cash held for sale	—	—	—	(5.4)	—	(5.4)
Effect of exchange rate changes on cash and cash equivalents	—	—	73.8	(17.0)	—	56.8
Change in cash and cash equivalents	—	—	—	(130.6)	—	(130.6)
Cash and cash equivalents, beginning of year	—	—	—	216.9	—	216.9
Cash and cash equivalents, end of year	$ —	$ —	$ —	$ 86.3	$ —	$ 86.3

Pentair plc and Subsidiaries
Condensed Consolidating Statement of Operations and Comprehensive Income (Loss)
Year Ended December 31, 2016

In millions	Parent Company Guarantor	Subsidiary Guarantor	Subsidiary Issuer	Non-guarantor Subsidiaries	Eliminations	Consolidated Total
Net sales	$ —	$ —	$ —	$ 2,780.6	$ —	$ 2,780.6
Cost of goods sold	—	—	—	1,821.5	—	1,821.5
Gross profit	—	—	—	959.1	—	959.1
Selling, general and administrative	12.6	—	1.2	517.6	—	531.4
Research and development	—	—	—	73.3	—	73.3
Operating (loss) income	(12.6)	—	(1.2)	368.2	—	354.4
Loss (earnings) from continuing operations of investment in subsidiaries	(189.4)	(189.4)	(301.5)	—	680.3	—
Other (income) expense:						
Loss on sale of businesses	—	—	—	3.9	—	3.9
Net interest expense	—	—	110.9	29.2	—	140.1
Other income	—	—	—	(10.5)	—	(10.5)
Income (loss) from continuing operations before income taxes	176.8	189.4	189.4	345.6	(680.3)	220.9
Provision (benefit) for income taxes	(1.4)	—	—	44.1	—	42.7
Net income (loss) from continuing operations	178.2	189.4	189.4	301.5	(680.3)	178.2
Income from discontinued operations, net of tax	—	—	—	343.4	—	343.4
Gain from sale of discontinued operations, net of tax	—	—	—	0.6	—	0.6
Earnings (loss) from discontinued operations of investment in subsidiaries	344.0	344.0	344.0	—	(1,032.0)	—
Net income (loss)	$ 522.2	$ 533.4	$ 533.4	$ 645.5	$ (1,712.3)	$ 522.2
Comprehensive income (loss), net of tax						
Net income (loss)	$ 522.2	$ 533.4	$ 533.4	$ 645.5	$ (1,712.3)	$ 522.2
Changes in cumulative translation adjustment	(83.0)	(83.0)	(83.0)	(83.0)	249.0	(83.0)
Changes in market value of derivative financial instruments, net of tax	(8.3)	(8.3)	(8.3)	(8.3)	24.9	(8.3)
Comprehensive income (loss)	$ 430.9	$ 442.1	$ 442.1	$ 554.2	$ (1,438.4)	$ 430.9

Pentair plc and Subsidiaries
Condensed Consolidating Statement of Cash Flows
Year Ended December 31, 2016

In millions	Parent Company Guarantor	Subsidiary Guarantor	Subsidiary Issuer	Non-guarantor Subsidiaries	Eliminations	Consolidated Total
Operating activities						
Net cash provided by (used for) operating activities	$ 595.7	$ 541.7	$ 532.9	$ 903.4	$ (1,712.3)	$ 861.4
Investing activities						
Capital expenditures	—	—	—	(43.3)	—	(43.3)
Proceeds from sale of property and equipment	—	—	—	18.8	—	18.8
Proceeds from sale of businesses and other	—	—	—	(5.1)	—	(5.1)
Acquisitions, net of cash acquired	—	—	—	(25.0)	—	(25.0)
Net intercompany loan activity	—	—	667.3	(191.0)	(476.3)	—
Net cash provided by (used for) investing activities of continuing operations	—	—	667.3	(245.6)	(476.3)	(54.6)
Net cash provided by (used for) investing activities of discontinued operations	—	—	—	(67.2)	—	(67.2)
Net cash provided by (used for) investing activities	—	—	667.3	(312.8)	(476.3)	(121.8)
Financing activities						
Net receipts (repayments) of commercial paper and revolving long-term debt	—	—	(385.8)	0.5	—	(385.3)
Repayment of long-term debt	—	—	—	(0.7)	—	(0.7)
Net change in advances to subsidiaries	(372.8)	(541.7)	(842.3)	(431.8)	2,188.6	—
Shares issued to employees, net of shares withheld	20.7	—	—	—	—	20.7
Dividends paid	(243.6)	—	—	—	—	(243.6)
Other	—	—	—	8.8	—	8.8
Net cash provided by (used for) financing activities	(595.7)	(541.7)	(1,228.1)	(423.2)	2,188.6	(600.1)
Change in cash held for sale	—	—	—	1.1	—	1.1
Effect of exchange rate changes on cash and cash equivalents	—	—	27.8	(55.1)	—	(27.3)
Change in cash and cash equivalents	—	—	(0.1)	113.4	—	113.3
Cash and cash equivalents, beginning of year	—	—	0.1	103.5	—	103.6
Cash and cash equivalents, end of year	$ —	$ —	$ —	$ 216.9	$ —	$ 216.9

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Our management, with the participation of our Chief Executive Officer and our Chief Financial Officer, evaluated the effectiveness of the design and operation of our disclosure controls and procedures as of the end of the year ended December 31, 2018 , pursuant to Rule 13a-15(b) of the Securities Exchange Act of 1934 ("the Exchange Act"). Based upon their evaluation, our Chief Executive Officer and our Chief Financial Officer concluded that our disclosure controls and procedures were effective as of the year ended December 31, 2018 to ensure that information required to be disclosed by us in the reports we file or submit under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the Securities and Exchange Commission's rules and forms and to ensure that information required to be disclosed by us in the reports we file or submit under the Exchange Act is accumulated and communicated to our management, including our principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosures.

Management's Annual Report on Internal Control Over Financial Reporting
The report of management required under this ITEM 9A is contained in ITEM 8 of this Annual Report on Form 10-K under the caption "Management's Report on Internal Control Over Financial Reporting."

Attestation Report of Independent Registered Public Accounting Firm
The attestation report required under this ITEM 9A is contained in ITEM 8 of this Annual Report on Form 10-K under the caption "Report of Independent Registered Public Accounting Firm."

Changes in Internal Control over Financial Reporting
There was no change in our internal control over financial reporting that occurred during the quarter ended December 31, 2018 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Information required under this item with respect to directors is contained in our Proxy Statement for our 2019 annual general meeting of shareholders under the captions “Corporate Governance Matters,” “Proposal 1 Re-elect Director Nominees” and “Section 16(a) Beneficial Ownership Reporting Compliance” and is incorporated herein by reference.

Information required under this item with respect to executive officers is contained in Part I of this Form 10-K under the caption “Executive Officers of the Registrant.”

Our Board of Directors has adopted Pentair’s Code of Business Conduct and Ethics and designated it as the code of ethics for the Company’s Chief Executive Officer and senior financial officers. The Code of Business Conduct and Ethics also applies to all employees and directors in accordance with New York Stock Exchange Listing Standards. We have posted a copy of Pentair’s Code of Business Conduct and Ethics on our website at http://pentair.com/en/about-us/leadership/corporate-governance . We intend to satisfy the disclosure requirements under Item 5.05 of Form 8-K regarding amendments to or waivers from, Pentair’s Code of Business Conduct and Ethics by posting such information on our website at http://pentair.com/en/about-us/leadership/corporate-governance .

We are not including the information contained on our website as part of, or incorporating it by reference into, this report.

ITEM 11. EXECUTIVE COMPENSATION

Information required under this item is contained in our Proxy Statement for our 2019 annual general meeting of shareholders under the captions “Compensation Discussion and Analysis,” “Compensation Committee Report,” “Executive Compensation Tables” and “Corporate Governance Matters - Director Compensation” and is incorporated herein by reference.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Information required under this item with respect to security ownership is contained in our Proxy Statement for our 2019 annual general meeting of shareholders under the caption “Security Ownership” and is incorporated herein by reference.

The following table summarizes, as of December 31, 2018 , information about compensation plans under which our equity securities are authorized for issuance:

Plan category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (a)	Weighted-average exercise price of outstanding options, warrants and rights (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (c)
Equity compensation plans approved by security holders:			
2012 Stock and Incentive Plan	2,972,041 [1]	$ 38.84 [2]	4,453,028 [3]
2008 Omnibus Stock Incentive Plan	1,017,891 [4]	23.10 [2]	— [5]
Total	3,989,932	$ 34.41 [2]	4,453,028

[1] Consists of 2,602,660 shares subject to stock options, 100,028 shares subject to restricted stock units, and 269,353 shares subject to performance share awards.

[2] Represents the weighted average exercise price of outstanding stock options and does not take into account outstanding restricted stock units or performance share units.

[3] Represents securities remaining available for issuance under the 2012 Stock and Incentive Plan.

[4] Consists of 1,017,891 shares subject to stock options.

[5] The 2008 Omnibus Stock Incentive Plan was terminated in 2012. Restricted stock units previously granted under the 2008 Omnibus Stock Incentive Plan remain outstanding, but no further options or shares may be granted under this plan.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

Information required under this item is contained in our Proxy Statement for our 2019 annual general meeting of shareholders under the captions “Proposal 1 Re-elect Director Nominees - Director Independence” and “Corporate Governance Matters - The Board’s Role and Responsibilities - Policies and Procedures Regarding Related Person Transactions” and is incorporated herein by reference.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

Information required under this item is contained in our Proxy Statement for our 2019 annual general meeting of shareholders under the caption “Proposal 3 Ratify, by Non-Binding Advisory Vote, the Appointment of Deloitte & Touche LLP as the Independent Auditor of Pentair plc and to Authorize, by Binding Vote, the Audit and Finance Committee of the Board of Directors to Set the Auditor’s Remuneration” and is incorporated herein by reference.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) List of documents filed as part of this report:

(1) Financial Statements

Consolidated Statements of Operations and Comprehensive Income for the years ended December 31, 2018 , 2017 and 2016

Consolidated Balance Sheets as of December 31, 2018 and 2017

Consolidated Statements of Cash Flows for the years ended December 31, 2018 , 2017 and 2016

Consolidated Statements of Changes in Equity for the years ended December 31, 2018 , 2017 and 2016

Notes to Consolidated Financial Statements

(2) Financial Statement Schedule

Schedule II — Valuation and Qualifying Accounts

All other schedules for which provision is made in the applicable accounting regulations of the Securities and Exchange Commission have been omitted because they are not applicable or the required information is shown in the financial statements or notes thereto.

(3) Exhibits

The exhibits of this Annual Report on Form 10-K included herein are set forth below.

Exhibit Number	Exhibit
2.1	Share Purchase Agreement, dated August 18, 2016, by and between Emerson Electric Co. and Pentair plc (Incorporated by reference to Exhibit 2.1 in the Quarterly Report on Form 10-Q of Pentair plc filed with the Commission on October 25, 2016 (File No. 001-11625)).
2.2	Separation and Distribution Agreement, dated as of April 27, 2018, by and between Pentair plc and nVent Electric plc (Incorporated by reference to Exhibit 2.1 to the Current Report on Form 8-K of Pentair plc filed with the Commission on April 30, 2018) (File No. 001-11625)).
2.3	Tax Matters Agreement, dated as of April 27, 2018, by and between Pentair plc and nVent Electric plc (Incorporated by reference to Exhibit 2.2 to the Current Report on Form 8-K of Pentair plc filed with the Commission on April 30, 2018 (File No. 001-11625)).
2.4	Transition Services Agreement, dated as of April 27, 2018, by and between Pentair plc and nVent Electric plc (Incorporated by reference to Exhibit 2.3 to the Current Report on Form 8-K of Pentair plc filed with the Commission on April 30, 2018 (File No. 001-11625)).
2.5	Employee Matters Agreement, dated as of April 27, 2018, by and between Pentair plc and nVent Electric plc (Incorporated by reference to Exhibit 2.4 to the Current Report on Form 8-K of Pentair plc filed with the Commission on April 30, 2018 (File No. 001-11625)).
3.1	Amended and Restated Memorandum and Articles of Association of Pentair plc (Incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of Pentair plc filed with the Commission on May 9, 2017 (File No. 001-11625)).
4.1	Indenture, dated as of September 24, 2012, among Pentair Finance S.A. (formerly Tyco Flow Control International Finance S.A.) (as Issuer), Pentair Ltd. (as Guarantor) and Wells Fargo Bank, National Association (as Trustee) (Incorporated by reference to Exhibit 4.1 in the Current Report on Form 8-K of Pentair Ltd. filed with the Commission on September 28, 2012 (File No. 001-11625)).
4.2	Second Supplemental Indenture, dated as of September 24, 2012, among Pentair Finance S.A. (formerly Tyco Flow Control International Finance S.A.) (as Issuer), Pentair Ltd. (as Guarantor), Pentair, Inc. and Wells Fargo Bank, National Association (as Trustee) (Incorporated by reference to Exhibit 4.3 in the Current Report on Form 8-K of Pentair Ltd. filed with the Commission on September 28, 2012 (File No. 001-11625)).

4.3	Fourth Supplemental Indenture, dated as of November 26, 2012, among Pentair Finance S.A. (as Issuer), Pentair Ltd. (as Guarantor) and Wells Fargo Bank, National Association (as Trustee) (Incorporated by reference to Exhibit 4.2 in the Current Report on Form 8-K of Pentair Ltd. filed with the Commission on November 28, 2012 (File No. 001-11625)).
4.4	Fifth Supplemental Indenture, dated as of December 18, 2012, among Pentair Finance S.A. (as Issuer), Pentair Ltd. (as Guarantor) and Wells Fargo Bank, National Association (as Trustee) (Incorporated by reference to Exhibit 4.1 in the Current Report on Form 8-K of Pentair Ltd. filed with the Commission on December 18, 2012 (File No. 001-11625)).
4.5	Sixth Supplemental Indenture, dated as of May 20, 2014, among Pentair Finance S.A., Pentair Ltd., Pentair Investments Switzerland GmbH, Pentair plc and Wells Fargo Bank, National Association, as trustee (Incorporated by reference to Exhibit 4.3 in the Current Report on Form 8-K of Pentair plc filed with the Commission on May 20, 2014 (File No. 001-11625)).
4.6	Seventh Supplemental Indenture, dated as of May 26, 2017, among Pentair Finance S.A., Pentair plc, Pentair Investments Switzerland GmbH and Wells Fargo Bank, National Association as trustee (Incorporated by reference to Exhibit 4.1 to the Current Report on Form 8-K of Pentair plc filed with the Commission on May 31, 2017 (File No. 001-11625)).
4.7	Senior Indenture, dated May 2, 2011 by and among Pentair, Inc. and Wells Fargo Bank, National Association (Incorporated by reference to Exhibit 4.5 to Pentair, Inc.'s Registration Statement on Form S-3 (Registration 333-173829)).
4.8	First Supplemental Indenture, dated as of May 9, 2011, among Pentair, Inc., the guarantors named therein and Wells Fargo Bank, National Association (Incorporated by reference to Exhibit 4.2 in the Current Report on Form 8-K of Pentair, Inc. filed with the Commission on May 9, 2011 (File No. 000-04689)).
4.9	Third Supplemental Indenture, dated October 1, 2012, among Pentair Ltd., Pentair, Inc. and Wells Fargo Bank, National Association, as trustee (Incorporated by reference to Exhibit 4.1 in the Current Report on Form 8-K of Pentair Ltd. filed with the Commission on October 1, 2012 (File No. 001-11625)).
4.10	Fourth Supplemental Indenture, dated as of December 17, 2012, among Pentair, Inc. (as Issuer), Pentair Ltd. (as Guarantor) and Wells Fargo Bank, National Association (as Trustee) (Incorporated by reference to Exhibit 4.2 in the Current Report on Form 8-K of Pentair Ltd. filed with the Commission on December 18, 2012 (File No. 001-11625)).
4.11	Fifth Supplemental Indenture, dated as of May 20, 2014, among Pentair, Inc., Pentair Ltd., Pentair Investments Switzerland GmbH, Pentair plc and Wells Fargo Bank, National Association, as trustee (Incorporated by reference to Exhibit 4.2 in the Current Report on Form 8-K of Pentair plc filed with the Commission on May 20, 2014 (File No. 001-11625)).
4.12	Sixth Supplemental Indenture, dated as of May 26, 2017, among Pentair, Inc., Pentair plc, Pentair Investments Switzerland GmbH and Wells Fargo Bank, National Association, as trustee (Incorporated by reference to Exhibit 4.2 to the Current Report on Form 8-K of Pentair plc filed with the Commission on May 31, 2017 (File No. 001-11625)).
4.13	Credit Agreement, dated as of April 25, 2018, among Pentair plc, Pentair Investments Switzerland GmbH, Pentair Finance S.à r.l., Pentair, Inc. and the lenders and agents party thereto (Incorporated by reference to Exhibit 4.1 to the Current Report on Form 8-K of Pentair plc filed with the Commission on April 30, 2018) (File No. 001-11625)).
4.14	Indenture, dated as of September 16, 2015, among Pentair Finance S.A. (as Issuer), Pentair plc (as Parent and Guarantor), Pentair Investments Switzerland GmbH (as Guarantor) and U.S. Bank National Association (as Trustee) (Incorporated by reference to Exhibit 4.1 to the Current Report on Form 8-K of Pentair plc filed with the Commission on September 16, 2015 (File No. 001-11625)).
4.15	Second Supplemental Indenture, dated as of September 16, 2015, among Pentair Finance S.A. (as Issuer), Pentair plc (as Parent and Guarantor), Pentair Investments Switzerland GmbH (as Guarantor) and U.S. Bank National Association (as Trustee) (Incorporated by reference to Exhibit 4.3 to the Current Report on Form 8-K of Pentair plc filed with the Commission on September 16, 2015 (File No. 001-11625)).
4.16	Third Supplemental Indenture, dated as of September 16, 2015, among Pentair Finance S.A. (as Issuer), Pentair plc (as Parent and Guarantor), Pentair Investments Switzerland GmbH (as Guarantor) and U.S. Bank National Association (as Trustee) (Incorporated by reference to Exhibit 4.4 to the Current Report on Form 8-K of Pentair plc filed with the Commission on September 16, 2015 (File No. 001-11625)).

4.17	Fourth Supplemental Indenture, dated as of September 17, 2015, among Pentair Finance S.A. (as Issuer), Pentair plc (as Parent and Guarantor), Pentair Investments Switzerland GmbH (as Guarantor) and U.S. Bank National Association (as Trustee) (Incorporated by reference to Exhibit 4.2 to the Current Report on Form 8-K of Pentair plc filed with the Commission on September 17, 2015 (File No. 001-11625)).
4.18	Fifth Supplemental Indenture, dated as of May 26, 2017, among Pentair Finance S.A., Pentair plc, Pentair Investments Switzerland GmbH and U.S. Bank National Association, as trustee (Incorporated by reference to Exhibit 4.3 to the Current Report on Form 8-K of Pentair plc filed with the Commission on May 31, 2017 (File No. 001-11625)).
10.1	Tax Sharing Agreement, dated September 28, 2012 by and among Pentair Ltd., Tyco International Ltd. and The ADT Corporation (Incorporated by reference to Exhibit 10.1 in the Current Report on Form 8-K of Pentair Ltd. filed with the Commission on September 28, 2012 (File No. 001-11625)).
10.2	Pentair plc 2012 Stock and Incentive Plan, as amended and restated effective as of January 1, 2017. (Incorporated by reference to Exhibit 10.2 to the Annual Report on Form 10-K of Pentair plc for the year ended December 31, 2016 (File No. 001-11625)).*
10.3	Form of Executive Officer Stock Option Grant Agreement for grants made prior to January 1, 2017 (Incorporated by reference to Exhibit 10.7 in the Current Report on Form 8-K of Pentair plc filed with the Commission on June 3, 2014 (File No. 001-11625)).*
10.4	Form of Executive Officer Restricted Stock Unit Grant Agreement for grants made prior to January 1, 2017 (Incorporated by reference to Exhibit 10.8 in the Current Report on Form 8-K of Pentair plc filed with the Commission on June 3, 2014 (File No. 001-11625)).*
10.5	Form of Non-Employee Director Stock Option Grant Agreement (Incorporated by reference to Exhibit 10.10 in the Current Report on Form 8-K of Pentair plc filed with the Commission on June 3, 2014 (File No. 001-11625)).*
10.6	Form of Non-Employee Director Restricted Stock Unit Grant Agreement (Incorporated by reference to Exhibit 10.11 in the Current Report on Form 8-K of Pentair plc filed with the Commission on June 3, 2014 (File No. 001-11625)).*
10.7	Form of Performance Share Units Grant Agreement for grants made during 2016 (Incorporated by reference to Exhibit 10.8 in the Annual Report on Form 10-K of Pentair plc filed with the Commission on February 26, 2016 (File No. 001-11625)).*
10.8	Pentair plc 2008 Omnibus Stock Incentive Plan, as amended and restated effective as of January 1, 2017 (Incorporated by reference to Exhibit 10.9 to the Annual Report on Form 10-K of Pentair plc for the year ended December 31, 2016 (File No. 001-11625)).*
10.9	Pentair plc Omnibus Stock Incentive Plan, as amended and restated (Incorporated by reference to Exhibit 10.3 in the Current Report on Form 8-K of Pentair plc filed with the Commission on June 3, 2014 (File No. 001-11625)).*
10.10	Pentair plc Outside Directors Nonqualified Stock Option Plan, as amended and restated (Incorporated by reference to Exhibit 10.4 in the Current Report on Form 8-K of Pentair plc filed with the Commission on June 3, 2014 (File No. 001-11625)).*
10.11	Form of Assignment and Assumption Agreement, among Pentair, Inc., Pentair Ltd. and the executive officers of Pentair Ltd. relating to Key Executive Employment and Severance Agreement (Incorporated by reference to Exhibit 10.12 in the Current Report on Form 8-K of Pentair Ltd. filed with the Commission on October 1, 2012 (File No. 001-11625)).*
10.12	Form of Key Executive Employment and Severance Agreement for John L. Stauch and Mark C. Borin (Incorporated by reference to Exhibit 10.1 in the Quarterly Report on Form 10-Q of Pentair plc for the quarter ended June 30, 2018 (File No. 001-11625)).*
10.13	Form of Key Executive Employment and Severance Agreement for Karly R. Frykman and John H. Jacko (Incorporated by reference to Exhibit 10.2 in the Quarterly Report on Form 10-Q of Pentair plc for the quarter ended June 30, 2018 (File No. 001-11625)).*
10.14	Form of Key Executive Employment and Severance Agreement for Karla C. Robertson, Kelly A. Baker and Philip M. Rolchigo (Incorporated by reference to Exhibit 10.3 in the Quarterly Report on Form 10-Q of Pentair plc for the quarter ended June 30, 2018 (File No. 001-11625)).*
10.15	Pentair plc Compensation Plan for Non-Employee Directors, as amended and restated (Incorporated by reference to Exhibit 10.6 in the Current Report on Form 8-K of Pentair plc filed with the Commission on June 3, 2014 (File No. 001-11625)).*
10.16	Pentair plc Employee Stock Purchase and Bonus Plan, as amended and restated*
10.17	Pentair, Inc. Non-Qualified Deferred Compensation Plan, as amended and restated.*

10.18	Trust Agreement for Pentair, Inc. Non-Qualified Deferred Compensation Plan between Pentair, Inc. and Fidelity Management Trust Company (Incorporated by reference to Exhibit 10.18 contained in the Annual Report on Form 10-K of Pentair, Inc. for the year ended December 31, 1995 (File No. 000-04689)).*
10.19	Pentair, Inc. 1999 Supplemental Executive Retirement Plan as Amended and Restated effective August 23, 2000 (Incorporated by reference to Exhibit 10.2 in the Current Report on Form 8-K of Pentair, Inc. filed with the Commission on September 21, 2000 (File No. 000-04689)).*
10.20	Pentair, Inc. Supplemental Executive Retirement Plan effective January 1, 2009, as amended and restated (Incorporated by reference to Exhibit 10.13 in the Current Report on Form 8-K of Pentair plc filed with the Commission on June 3, 2014 (File No. 001-11625)).*
10.21	Pentair, Inc. Restoration Plan as Amended and Restated effective August 23, 2000 (Incorporated by reference to Exhibit 10.3 in the Current Report on Form 8-K of Pentair, Inc. filed with the Commission on September 21, 2000 (File No. 000-04689)).*
10.22	Pentair, Inc. Restoration Plan effective January 1, 2009, as amended and restated (Incorporated by reference to Exhibit 10.14 in the Current Report on Form 8-K of Pentair plc filed with the Commission on June 3, 2014 (File No. 001-11625)).*
10.23	Form of Deed of Indemnification for directors and executive officers of Pentair plc (Incorporated by reference to Exhibit 10.15 in the Current Report on Form 8-K of Pentair plc filed with the Commission on June 3, 2014 (File No. 001-11625)).*
10.24	Form of Indemnification Agreement for directors and executive officers of Pentair plc (Incorporated by reference to Exhibit 10.16 in the Current Report on Form 8-K of Pentair plc filed with the Commission on June 3, 2014 (File No. 001-11625)).*
10.25	Form of Executive Officer Key Talent Award Agreement (Incorporated by reference to Exhibit 10.2 to the Quarterly Report on Form 10-Q of Pentair plc for the quarter ended March 31, 2018 (File No. 001-11625)).*
10.26	Form of Executive Officer Stock Option Grant Agreement for grants made on or after January 1, 2017 and prior to February 26, 2018 (Incorporated by reference to Exhibit 10.31 to the Annual Report on Form 10-K of Pentair plc for the year ended December 31, 2016 (File No. 001-11625)).*
10.27	Form of Executive Officer Restricted Stock Unit Grant Agreement for grants made on or after January 2, 2017 and prior to February 26, 2018 (Incorporated by reference to Exhibit 10.32 to the Annual Report on Form 10-K of Pentair plc for the year ended December 31, 2016 (File No. 001-11625)).*
10.28	Form of Executive Officer Performance Unit Grant Agreement for grants made on or after January 1, 2017 and prior to February 26, 2018 (Incorporated by reference to Exhibit 10.33 to the Annual Report on Form 10-K of Pentair plc for the year ended December 31, 2016 (File No. 001-11625)).*
10.29	Form of Executive Officer Restricted Stock Unit Award Agreement for grants made on or after February 26, 2018 (Incorporated by reference to Exhibit 10.3 to the Quarterly Report on Form 10-Q of Pentair plc for the quarter ended March 31, 2018 (File No. 001-11625)).*
10.30	Form of Executive Officer Stock Option Award Agreement for grants made on or after February 26, 2018 (Incorporated by reference to Exhibit 10.4 to the Quarterly Report on Form 10-Q of Pentair plc for the quarter ended March 31, 2018 (File No. 001-11625)).*
10.31	Form of Executive Officer Performance Stock Unit Award Agreement for grants made on or after February 26, 2018 and prior to January 1, 2019 (Incorporated by reference to Exhibit 10.5 to the Quarterly Report on Form 10-Q of Pentair plc for the quarter ended March 31, 2018 (File No. 001-11625)).*
10.32	Form of Executive Officer Performance Stock Unit Award Agreement for grants made on or after January 1, 2019.*
10.33	Retirement Agreement, dated as of March 14, 2018, between Pentair plc and Randall J. Hogan (Incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of Pentair plc filed with the Commission on March 15, 2018 (File No. 001-11625)).*
21	List of Pentair plc subsidiaries.
23	Consent of Independent Registered Public Accounting Firm — Deloitte & Touche LLP.
24	Power of attorney.
31.1	Certification of Chief Executive Officer.
31.2	Certification of Chief Financial Officer.

32.1	Certification of Chief Executive Officer, Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2	Certification of Chief Financial Officer, Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101	The following materials from Pentair plc's Annual Report on Form 10-K for the year ended December 31, 2018 are filed herewith, formatted in XBRL (Extensible Business Reporting Language): (i) the Consolidated Statements of Operations and Comprehensive Income for the years ended December 31, 2018, 2017 and 2016, (ii) the Consolidated Balance Sheets as of December 31, 2018 and 2017, (iii) the Consolidated Statements of Cash Flows for the years ended December 31, 2018, 2017 and 2016, (iv) the Consolidated Statements of Changes in Equity for the years ended December 31, 2018, 2017 and 2016 and (v) the Notes to the Consolidated Financial Statements.

* Denotes a management contract or compensatory plan or arrangement.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, on February 19, 2019 .

PENTAIR PLC

By /s/ Mark C. Borin
Mark C. Borin
Executive Vice President and Chief Financial Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities indicated, on February 19, 2019 .

Signature	**Title**
/s/ John L. Stauch	President and Chief Executive Officer, Director
John L. Stauch	
/s/ Mark C. Borin	Executive Vice President and Chief Financial Officer
Mark C. Borin	
/s/ Ademir Sarcevic	Senior Vice President and Chief Accounting Officer
Ademir Sarcevic	
*	Director
Glynis A. Bryan	
*	Director
Jacques Esculier	
*	Director
T. Michael Glenn	
*	Director
Theodore L. Harris	
*	Director
David A. Jones	
*	Director
Michael T. Speetzen	
*	Director
Billie I. Williamson	

*By /s/ Karla C. Robertson
Karla C. Robertson
Attorney-in-fact

Schedule II — Valuation and Qualifying Accounts

Pentair plc and Subsidiaries

In millions	Beginning balance	Additions charged (reductions credited) to costs and expenses	Deductions [1]	Other changes [2]	Ending balance
Allowances for doubtful accounts					
Year ended December 31, 2018	$ 10.0	$ 1.1	$ 0.9	$ 2.4	$ 12.6
Year ended December 31, 2017	$ 9.0	$ 2.3	$ 2.2	$ 0.9	$ 10.0
Year ended December 31, 2016	$ 13.7	$ (1.2)	$ 3.9	$ 0.4	$ 9.0

(1) Uncollectible accounts written off, net of recoveries
(2) Result of foreign currency effects

PENTAIR PLC

EMPLOYEE STOCK PURCHASE AND BONUS PLAN
Amended and Restated Effective as of January 1, 2019

SECTION 1
HISTORY AND BACKGROUND

In connection with the merger of Pentair, Inc. with and into a wholly-owned subsidiary of Tyco Flow Control International Ltd. (to be renamed Pentair Ltd., and referred to herein as the "Company"), which occurred on September 28, 2012 (the "Merger"), the Company adopted this Employee Stock Purchase and Bonus Plan (the "Plan"), effective September 28, 2012, to provide to employees of the Company and its designated divisions and subsidiaries the opportunity to purchase shares of the Company's common stock after the Merger. The Plan is also considered a successor plan to the following pre-Merger plans: the Pentair, Inc. Employee Stock Purchase and Bonus Plan (effective March 1, 1977).

The Plan was amended and restated effective May 1, 2013, to reflect certain administrative changes made to the operation of the Plan.

The Plan was further amended and restated effective as of the consummation of the merger of Pentair Ltd. with and into Pentair plc to reflect the assumption of this Plan by Pentair plc and the applicability of the Plan to ordinary shares of Pentair plc, rather than common shares of Pentair Ltd., following such merger.

The Plan was further amended and restated effective as of November 17, 2017 to reflect certain administrative changes made to the Plan.

The Plan was amended and restated effective as of January 1, 2019 to suspend the International Stock Purchase and Bonus Plan (which was previously attached to the Plan as Appendix A) and to make certain other administrative changes.

The following sections of the Plan shall apply to the U.S. and Canadian employees of the Company and its participating divisions and subsidiaries.

SECTION 2
DEFINITIONS

Unless the context clearly requires otherwise, when capitalized the terms listed below shall have the following meanings when used in this Section or other parts of the Plan.

(1) **"Account"** is an account established with the Plan Agent and into which Stock purchased with accumulated Participant contributions, employer matching contributions made on behalf of a Participant, and cash dividends paid with respect to such Stock (as applicable), are held on behalf of each Participant under the Plan. A Participant's rights with

respect to his or her Account shall be subject to the terms and conditions established by the Plan Agent from time to time.

(2) **"Affiliated Company"** is (a) any corporation or business located in and organized under the laws of one of the United States which is a member of a controlled group of corporations or businesses (within the meaning of Code section 414(b) or (c)) that includes the Company, but only during the periods such affiliation exists, or (b) any other entity in which the Company may have a significant ownership interest, and which the Plan Administrator determines shall be an Affiliated Company for purposes of the Plan.

(3) **"Code"** is the Internal Revenue Code of 1986, as amended.

(4) **"Company"** is Pentair plc, an Irish company.

(5) **"Compensation"** is a Participant's base wages or salary (i.e., exclusive of overtime or bonus payments) or the equivalent thereof, including, by way of example, vacation, jury duty or shift differential pay, paid to or on behalf of a Participant for services rendered to the Company or a Participating Employer.

(6) **"Eligible Employee"** is an Employee, except those Employees:

(i) who are included in a unit of Employees covered by a collective bargaining agreement between Employee representatives and a Participating Employer, unless and to the extent such agreement provides that such Employees shall be covered by the Plan, or the Participating Employer and the Plan Administrator have otherwise agreed to extend coverage under the Plan to such Employees;

(ii) who, as determined by the Plan Administrator in its sole discretion, are not regular or permanent full- or part-time Employees, including, without limitation interns or other temporary Employees;

(iii) whose Employer is not a Participating Employer; or

(iv) who are not treated as Employees by the Company or a Participating Employer for purposes of the Plan even though they may be so treated or considered under applicable law, including Code section 414(n), the Federal Insurance Contribution Act or the Fair Labor Standards Act (e.g., individuals treated as employees of a third party or as self-employed).

(7) **"Employee"** is an individual who is an employee of the Company or an Affiliated Company.

(8) **"Participant"** is an Eligible Employee who has met the age requirement for Plan participation and properly completed and submitted the authorization form necessary for participation.

(9) **"Participating Employer"** is an Affiliated Company that is making, or has agreed to make, contributions under the Plan with respect to some or all of its Eligible Employees, but only during the period such agreement to contribute remains in effect. The Company must approve each Participating Employer, except that any entity that is considered a Participating Employer under the Plan immediately prior to the Restatement Effective Date automatically shall be considered a Participating Employer hereunder on the Restatement Effective Date without further action by the Company or such employer.

(10) **"Plan"** is the Pentair plc Employee Stock Purchase and Bonus Plan as described in this plan document and as it may be amended from time to time.

(11) **"Plan Administrator"** is the Company, and may include an employee or committee of employees of the Company or any subsidiary thereof that has been appointed by the Company to serve as the plan administrator of the Plan.

(12) **"Plan Agent"** is the financial services firm or other entity duly appointed by the Plan Administrator to (i) receive funds contributed by Participants and Participating Employers, (ii) purchase shares of Stock with funds contributed by Participants and Participating Employers, and (iii) maintain Participant Accounts.

(13) **"Prospectus"** is the prospectus, as in effect from time to time, which describes the Plan and which is delivered to eligible Participants with respect to the purchase of Stock under the Plan.

(14) **"Restatement Effective Date"** is November 17, 2017, the date this amended and restated Plan became effective.

(15) **"Stock"** is the ordinary shares of Pentair plc, nominal value $0.01 per share.

SECTION 3
ELIGIBILITY

All Eligible Employees of a Participating Employer may elect to participate in the Plan after the Restatement Effective Date upon the attainment of age eighteen (18). Notwithstanding the foregoing, all Participants in the Plan as of the date immediately preceding the Restatement Effective Date automatically shall be considered Participants hereunder on the Restatement Effective Date.

SECTION 4
PARTICIPATION

4.1 **General**. Plan participation is voluntary and Eligible Employees do not automatically become Participants upon meeting the Plan's eligibility requirements, except as set forth in Section 3.1. An Eligible Employee, who has met the Plan's eligibility requirements as described in Section 3, may commence Plan participation after the Restatement Effective Date by delivering an authorization for deductions from such individual's Compensation, in accordance with procedures established by the Plan Administrator. Notwithstanding the

foregoing, the deduction authorization in effect for each Participant in the Plan as of the Restatement Effective Date automatically shall be given effect hereunder on and after the Restatement Effective Date.

4.2 **Withdrawal from Participation**. A Participant may elect to cease participation under the Plan at any time, even though he or she remains an Eligible Employee of the Company or a Participating Employer, by giving written notice of withdrawal in accordance with procedures established by the Plan Administrator. Such an individual may elect to resume participation in the Plan at any time in accordance with procedures established by Plan Administrator, provided he or she is an Eligible Employee at the time participation resumes.

SECTION 5
CONTRIBUTIONS

5.1 **Participant Contributions**. A Participant may authorize his or her employer to make a deduction from each paycheck for purposes of purchasing Stock as a percentage of Compensation, in accordance with Section 4.1. The minimum deduction allowed is 0.01% of Compensation per month; the maximum deduction allowed is 15% of such Participant's Compensation (up to a maximum payroll deduction of US$9,000 per calendar year for Participants that are employed in the United States and CA$11,000 for Participants that are employed in Canada, which may be implemented on an annual, per month or per payroll period basis as determined by the Company). A Participant may change the amount of his or her payroll deduction at any time in accordance with procedures established by the Plan Administrator, and such change shall be effective as soon as practicable thereafter. Until such contributions are transferred to the Plan Agent for purposes of purchasing Stock under the Plan at the time or times determined by the Plan Administrator and in accordance with Section 6, the amounts so collected may be commingled with the general assets of the Company and used for general purposes and no interest shall be paid in connection with such amounts.

5.2 **Employer Bonus Contribution**. At the time or times determined by the Plan Administrator, the Company and Participating Employers shall pay to the Plan Agent on behalf of each Participant employed by such employer an amount equal to twenty-five percent (25%) of the contributions made by such Participant through payroll deductions from Compensation.

5.3 **Dividends**. Cash dividends paid on Stock held in a Participant's Account shall, as elected by the Participant in accordance with procedures established by the Plan Administrator, be used by the Plan Agent to purchase additional shares of Stock on behalf of such Participant or paid directly to the Participant in cash.

SECTION 6
PURCHASE OF STOCK

6.1 **Participant Accounts**. The Plan Agent shall establish for each Participant an Account to hold the Stock purchased on behalf of such Participant. All Stock and other amounts allocated to such Account shall at all times be fully vested and nonforfeitable.

6.2 **Purchasing Stock**. The Plan Agent shall use all Participant and employer contributions, and including cash dividends (if so elected in accordance with Section 5.3), to purchase Stock on the open market. The Plan Agent shall make all such purchases on a single business day or over a number of business days in the month, as agreed to by the Plan Agent and the Plan Administrator. The Stock so purchased shall be allocated to the Participant's Account on behalf of whom purchases were made based on (i) the actual purchase price for such Stock, in such case where the Plan Agent makes a single purchase of Stock under the Plan in one day or (ii) an average purchase price, as determined by the Plan Administrator and the Plan Agent, in the case where multiple purchases are made on one or more than one day. No interest shall be paid on cash amounts (if any) held by the Plan Agent regardless of whether such cash is being held in anticipation of the date on which Stock purchases shall be made or held pending a refund to a terminating Participant.

SECTION 7
ENDING PARTICIPATION

7.1 **General**. A Participant may elect to discontinue Plan participation even though he or she remains an Eligible Employee of the Company or a Participating Employer. In addition, a Participant may cease Plan participation by reason of becoming an Employee of an Affiliated Company that is not a Participating Employer, by joining a group of Employees who are not Eligible Employees, or by qualifying for benefits under a long-term disability plan maintained by the Company or a Participating Employer. At such time as a Participant shall cease employment with the Company and all Affiliated Companies, Plan participation shall cease. In accordance with procedures established by the Plan Administrator, any contributions made by a Participant prior to discontinuing participation in the Plan shall be used to purchase Stock in accordance with Section 6 hereunder.

7.2 **Discontinuing Participation**. An individual may, in accordance with procedures established by the Plan Administrator, elect to cease making contributions under the Plan, even though he or she remains an Eligible Employee of the Company or a Participating Employer. In addition, a Participant who ceases earning Compensation (as determined by the Plan Administrator), for example, a Participant who commences an unpaid leave of absence or other type of leave under which he or she no longer earns compensation that has been determined by the Plan Administrator to be Compensation for purposes under the Plan, shall automatically cease making contributions under the Plan.

7.3 **Ceasing to be an Eligible Employee**. Participants who cease to be Eligible Employees but remain Employees of the Company or an Affiliated Company shall automatically cease making contributions under the Plan effective as soon as administratively feasible.

SECTION 8
DISPOSITION OF ACCOUNTS

The Participant shall be eligible to receive a distribution of his or her Account in accordance with procedures established by the Plan Agent.

SECTION 9
ADMINISTRATION

9.1 **Term of Plan**. This Plan is effective November 17, 2017 and shall remain in effect for a period of ten (10) years after such effective date, unless the Plan is earlier terminated as provided in Section 10.6.

9.2 **Prospectus**. Upon completing the eligibility requirements described in Section 3, an Eligible Employee shall receive from the Plan Administrator or its delegate a copy of the Prospectus, which describes the Plan.

9.3 **Reporting**. The Plan Agent shall provide to each Participant quarterly, or at such other intervals as may be necessary or appropriate, the following information:

(a) the total amount contributed to each Participant's Account for such quarter, whether by payroll deduction, or the Participant's employer;

(b) the number of shares of Stock purchased on behalf of the Participant with all of such contributions; and

(c) the total number of shares of Stock then allocated to the Participant's Account.

9.4 **Voting of Stock in Accounts**. Participants will not have any voting, dividend or other rights of a shareholder with respect to shares of Stock subject to this Plan until such shares have been delivered to the Participant's Account. Once the Stock is delivered to the Participant's Account, he or she will be entitled to all notices and correspondence provided to any shareholder of record who is not a Participant, including proxy statements. The Plan Agent shall be responsible for soliciting and receiving proxy instructions from each Participant and shall vote the Stock allocated to each Participant's Account in accordance with the instructions, if any, provided by such Participant.

9.5 **Fees and Commissions**. Unless otherwise determined by the Plan Administrator, the Company shall pay commissions, service charges or other costs incurred with respect to the purchase of Stock for purposes of the Plan. Unless otherwise determined by the Plan Administrator, when any such Stock in an Account is sold or the Participant ceases to be an Employee of the Company or an Affiliate Company, the Participant is responsible for payment of any commissions, service charges or other costs incurred on account of such sale or ongoing administration of his or her Account.

SECTION 10
MISCELLANEOUS

10.1 **Voluntary Participation**. Participation in the Plan is entirely voluntary, and by maintaining the Plan the Company is not making a recommendation as to whether any Eligible Employee should invest in Stock. Investment in any stock involves risk, and each Eligible Employee must decide whether to accept the risk of investing in Stock.

10.2 **Employee Rights**. The right of the Company or an Affiliated Company to discipline or discharge Employees, or to exercise rights related to the tenure of any individual's employment, shall not be affected in any manner by reason of the existence of the Plan or any action taken pursuant to the Plan.

10.3 **Construction**. The Plan Administrator shall have full power and authority to interpret and construe the Plan, to adopt rules and regulations not inconsistent with the Plan for purposes of administering the Plan with respect to matters not specifically covered in the Plan document and to amend and revoke any rules and regulations so adopted. Except as otherwise provided in the Plan, any interpretation of the Plan and any decision on any matter within the discretion of the Plan Administrator which is made in good faith by the Plan Administrator shall be final and binding.

10.4 **Interpretation**. Section and subsection headings are for convenience of reference and not part of this Plan, and shall not influence its interpretation. Wherever any words are used in the Plan in the singular, masculine, feminine or neuter form, they shall be construed as though they were also used in the plural, feminine, masculine or non-neuter form, respectively, in all cases where such interpretation is reasonable.

10.5 **Plan Amendment**. The Company may, by written resolution of its Board of Directors or through action of the Compensation Committee of such Board (or their delegate), at any time and from time to time, amend the Plan in whole or in part.

10.6 **Plan Termination**. The Company may, by written resolution of its Board of Directors or through action of the Compensation Committee of such Board, terminate the Plan at any time. In the event the Plan terminates, the Participant's Account shall be handled in the same manner as if the Participant had terminated employment with the Company and all Affiliated Companies.

10.7 **Choice of Law**. To the extent not preempted by applicable federal law, the construction and interpretation of the Plan shall be made in accordance with the laws of the State of Minnesota, but without regard to any choice or conflict of laws provisions thereof.

10.8 **Acceptance of Terms**. By electing to participate in the Plan, each Participant shall be deemed to have accepted all of the provisions of the Plan, and the terms and conditions set forth by the Plan Agent, and to have agreed to be fully bound thereby.

10.9 **Computational Errors**. In the event mathematical, accounting, or similar errors are made in maintaining Participant Accounts, the Plan Administrator or the Plan Agent, as the case may be, may make such equitable adjustments as it deems appropriate to correct such errors.

10.10 **Communications**. The Company, a Participating Employer or the Plan Agent may, unless otherwise prescribed by any applicable state or federal law or regulation, provide the Prospectus and any notices, forms or reports by using either paper or electronic means.

The undersigned, by authority of the Compensation Committee of the Board of Directors of Pentair plc, does hereby execute the foregoing document for and on behalf of Pentair plc effective as of January 1, 2019.

PENTAIR PLC

Dated: _____ By ___
Karla Robertson
Executive Vice President,
General Counsel, and Secretary

Exhibit 10.17

PENTAIR, INC.

NON-QUALIFIED DEFERRED COMPENSATION PLAN

As Amended and Restated Effective as of April 30, 2018

TABLE OF CONTENTS

Article I HISTORY, PURPOSE AND EFFECTIVE DATE OF PLAN 1

Article II DEFINITIONS AND CONSTRUCTION 3
Section 2.1. Definitions. 3
Section 2.2. Eligibility to Participate. 9
Section 2.3. Purpose. 9
Section 2.4. Construction. 10

Article III PARTICIPANT DEFERRALS 11
Section 3.1. Election to Participate. 11
Section 3.2. Amount of Participant's Deferrals. 12
Section 3.3. Payment of Deposits to Trustee. 13

Article IV EMPLOYER CONTRIBUTIONS 14
Section 4.1. Employer Discretionary Contribution. 14
Section 4.2. Employer Matching Contribution. 14
Section 4.3. Limit on Compensation for Purposes of Employer Contributions. 15
Section 4.4. Payment of Deposits to Trustee. 15

Article V TRUSTEE AND TRUST AGREEMENT 16
Section 5.1. Appointment. 16
Section 5.2. Fees and Expenses. 16
Section 5.3. Use of Trust. 16
Section 5.4. Responsibility and Authority for Fund Management. 16
Section 5.5. Trust Assets. 17

Article VI INVESTMENT; PARTICIPANT'S ACCOUNTS 18
Section 6.1. Allocation and Reallocation of Before-Tax Deposits and Employer Contributions. 18
Section 6.2. Allocation of Deferred Equity Awards. 18
Section 6.3. Investment of Deposits and Employer Contributions. 19
Section 6.4. Participant's Accounts. 20
Section 6.5. Beneficiaries. 20

Article VII PAYMENT OF ACCOUNTS 21
Section 7.1. Time and Form of Payments. 21
Section 7.2. Distribution Due to Death. 22
Section 7.3. Payment of Employer Contributions. 22
Section 7.4. Later Payment Deferral Elections. 23
Section 7.5. Miscellaneous. 23

Article VIII EMERGENCY WITHDRAWALS 24
Section 8.1. Restricted Withdrawals. 24

Article IX PLAN ADMINISTRATION 25
Section 9.1. Committee. 25
Section 9.2. Organization and Procedure. 26
Section 9.3. Delegation of Authority and Responsibility. 26
Section 9.4. Use of Professional Services. 26
Section 9.5. Fees and Expenses. 26
Section 9.6. Communications 26
Section 9.7. Claims. 27

Article X PLAN AMENDMENTS, PLAN TERMINATION, AND MISCELLANEOUS 28
Section 10.1. Amendments and Termination. 28
Section 10.2. Non-Guarantee of Employment. 29
Section 10.3. Rights to Trust Asset. 29
Section 10.4. Suspension of Rules. 29
Section 10.5. Requirement of Proof. 30
Section 10.6. Indemnification. 30
Section 10.7. Non-Alienation and Taxes. 30
Section 10.8. Not Compensation Under Other Benefit Plans. 31
Section 10.9. Savings Clause. 31
Section 10.10. Facility of Payment. 32
Section 10.11. Requirement of Releases. 32
Section 10.12. Board Action. 32
Section 10.13. Computational Errors. 32
Section 10.14. Unclaimed Benefits. 32
Section 10.15. Communications. 32

Article XI TRANSITIONAL RULES 33
Section 11.1. Introduction. 33
Section 11.2. Amounts Deferred Under Prior Plan. 33

PENTAIR, INC.

NON-QUALIFIED DEFERRED COMPENSATION PLAN

ARTICLE I
HISTORY, PURPOSE AND EFFECTIVE DATE OF PLAN

Effective January 1, 1993, Pentair, Inc. ("Pentair") established a non-qualified deferred compensation plan (the "Plan") for the benefit of certain management and highly compensated employees of Pentair and various companies in the Pentair controlled group. Under the Plan as so initially established, eligible participants could elect to defer receipt of base and bonus compensation in exchange for the unfunded, unsecured promise of the participant's employing company to pay the amounts deferred, plus earnings, at the time and in the manner selected by the participant when making a deferral election. Until the time of payment, the amounts deferred under the Plan, adjusted for any earnings credited with respect to those amounts, remain subject to the claims of the general creditors of the participant's employing company.

Pentair amended and restated the Plan, effective January 1, 1996, January 1, 1999, and January 1, 2002. As so amended and restated, the Plan continued to permit eligible employees of Pentair and its affiliates to defer receipt of base and bonus compensation in exchange for the unsecured promise of the participant's employing company to pay these amounts, as adjusted for earnings or losses by reference to deemed investment options selected by each participant, and commencing January 1, 1996 provided for the replacement of benefits no longer available to certain participants under the Pentair Retirement Savings and Stock Incentive Plan due to certain limitations imposed by the Internal Revenue Code of 1986.

Pentair amended the Plan in 2005 to reflect the 2004 acquisition of the WICOR, Inc. group of companies, and the extension of the Plan in 2005 to eligible employees of such group, and to qualify generally the Plan, the elections made thereunder, and the Plan's administration, for amounts deferred and contributed for periods after 2004, by the provisions of Section 409A of the Internal Revenue Code of 1986 and guidance thereunder issued by the Internal Revenue Service.

Pentair amended the Plan effective January 1, 2009, to reflect final Treasury Regulations under Section 409A of the Internal Revenue Code of 1986, as well as certain other changes. This document governs amounts deferred on or after January 1, 2005. Amounts deferred prior to January 1, 2005, are governed by terms of the Plan as in effect on December 31, 2004, which are contained in a separate document.

Pentair amended and restated the Plan effective October 1, 2010, to clarify the types of compensation that may be deferred under the Plan.

Pentair amended and restated the Plan effective September 28, 2012 to reflect the effect of the merger (the "Merger") contemplated by the Merger Agreement, dated as of March 27, 2012, by and among the Company, Tyco International Ltd., Pentair Ltd., Panthro Acquisition

Co. and Panthro Merger Sub, Inc., as amended, pursuant to which, on September 28, 2012, the Company became an indirect wholly-owned subsidiary of Pentair Ltd. and the Company's common stock was converted into the right to receive common shares of Pentair Ltd.

Pentair amended the Plan effective as of September 17, 2013 to change the definition of spouse so that it is consistent with Pentair's qualified retirement plans and the definition used by the Internal Revenue Service.

Pentair subsequently amended the Plan to make certain administrative changes effective as of January 1, 2014 and provided that individuals who were eligible to participate in the Flow Controls Supplemental Savings and Retirement Plan when it was frozen with respect to new deferrals effective as of January 1, 2014 were to be considered eligible employees under the Plan effective January 1, 2014, subject to certain limitations.

Pentair amended and restated the Plan in connection with the merger of Pentair Ltd. with and into Pentair plc effective as of the Re-domicile Date (as defined below) pursuant to which each shareholder of Pentair Ltd. will receive an ordinary share of Pentair plc in exchange for each Pentair Ltd. common share held immediately prior to the merger.

The Plan is being amended and restated in connection with the spin-off of nVent Electric plc from Pentair plc, effective as of April 30, 2018, pursuant to which each shareholder of Pentair plc will receive an ordinary share of nVent Electric plc.

The Plan is for the benefit of a select group of management and highly compensated employees. Benefits under the Plan are unfunded and unsecured general obligations of Pentair and its participating affiliates. Plan participants have the status of unsecured general creditors of their employing company. Any assets acquired or set aside for purposes of providing or measuring, or both, this deferred compensation may be held in a grantor trust as the property of the participant's employing company and subject to the claims of its general creditors. To the extent any assets are held in a grantor trust, the terms and provisions of the trust document will control in all cases where it is in conflict with the Plan.

ARTICLE II
DEFINITIONS AND CONSTRUCTION

Section 2.1 Definitions. Unless the context clearly or necessarily indicates the contrary, when capitalized the following words and phrases shall have the meanings shown when used in this Article or other parts of the Plan.

(1) **"Accounts"** are the accounts under the Plan to be maintained for each Participant or the Beneficiary of a deceased former Participant.

(2) **"Administrator"** is the person assigned by the Company or Committee to handle the day-to-day administration of the Plan.

(3) **"Base Compensation"** includes the items of remuneration paid to or on behalf of a Participant for services rendered to a Participating Employer as an Employee, as listed or described in the left-hand column of Schedule 1, but not including any such items listed or described in the right-hand column of Schedule 1. If a remuneration item is not listed or described in Schedule 1, the Committee shall determine whether such item is included or excluded from Base Compensation by taking into account the nature of the item and its similarity to an item which is so listed.

(4) **"Before-tax Deposits"** are compensation deferrals of Base Compensation and/or Bonus Compensation made under the Plan at the election of a Participant pursuant to Article III.

(5) **"Beneficiary"** is the individual, trust or other entity designated as such in writing by a Participant in accordance with applicable Plan provisions, or such person as otherwise determined under the Plan, to receive benefits accumulated hereunder in the event of the Participant's death. If a Participant is married at the time of death, the sole Beneficiary shall be the Participant's Spouse at such time unless the Spouse has otherwise waived or released the right to be named as a beneficiary hereunder, or to be considered as the Participant's surviving Spouse for such purposes (e.g., an enforceable prenuptial agreement), as determined in the discretion of the Committee, or the Spouse has consented in writing to the designation of a different Beneficiary and such consent is witnessed by an authorized Plan representative or a notary public.

(6) **"Bonus Compensation"** is compensation awarded to a Participant pursuant to one of the plans listed on Schedule 2. Compensation awarded to a Participant under any other incentive plan shall not be treated as Bonus Compensation.

(7) **"Change in Control"** or **"CIC"** is:

(i) any one of the following occurring prior to or upon the consummation of the Merger:

(A) When a person, or more than one person acting as a group, acquires more than fifty percent (50%) of the total fair market value or total voting power of the Company's stock;

(B) When a person, or more than one person acting as a group, acquires within a twelve (12) month consecutive period, ending with the date of the most recent stock acquisition, stock of the Company possessing at least thirty percent (30%) of the total voting power of the Company's stock;

(C) When a majority of the members of the Company's board of directors is replaced within a twelve (12) month period by directors whose appointment or election is not endorsed by a majority of the members of such board as constituted before such appointment or election; or

(D) When a person, or more than one person acting as a group, acquires within a twelve (12) month consecutive period assets from the Company or an entity controlled by the Company that have a total gross fair market value equal to seventy-five percent (75%) of the total fair market value of the assets of the Company and all such entities.

Once a person or group acquires stock meeting the thresholds set forth in paragraphs (A) and (B) immediately preceding, additional acquisitions of such stock by that person or group shall be ignored in determining whether another CIC has occurred. Asset transfers between or among controlled entities as determined before such transfers shall not be considered in applying paragraph (D) immediately preceding. This provision shall be interpreted and administered in a manner consistent with the definition of a "change of control" under Code section 409A.

(ii) any one of the following occurring after the consummation of the Merger:

(A) When a person, or more than one person acting as a group, acquires more than fifty percent (50%) of the total fair market value or total voting power of (1) prior to the Re-domicile Date, Pentair Ltd.'s common shares or (2) on or after the Re-domicile Date, Pentair plc's ordinary shares;

(B) When a person, or more than one person acting as a group, acquires within a twelve (12) month consecutive period, ending with the date of the most recent stock acquisition (1) prior to the Re-domicile Date, common shares of Pentair Ltd. or (2) on or after the Re-domicile Date, ordinary shares of Pentair plc, in either case possessing at least thirty percent (30%) of the total voting power of such common shares or ordinary shares, as applicable; provided that no such twelve (12) month period may include any period prior to the consummation of the Merger;

(C) When a majority of the members of the board of directors of (1) prior to the Re-domicile Date, Pentair Ltd. or (2) on or after the Re-domicile Date, Pentair plc is replaced within a twelve (12) month period by directors whose appointment or election is not endorsed by a majority of the members of such board as constituted before such appointment or election; provided that no such twelve (12) month period may include any period prior to the consummation of the Merger; or

(D) When a person, or more than one person acting as a group, acquires within a twelve (12) month consecutive period assets from (1) prior to the Re-domicile Date, Pentair Ltd. or an entity controlled by Pentair Ltd. or (2) on or after the Re-domicile Date, Pentair plc or an entity controlled by Pentair plc that, in either case, have a total gross fair market value equal to seventy-five percent (75%) of the total fair market value of the assets of Pentair Ltd. or Pentair plc and all such entities, as applicable; provided that no such twelve (12) month period may include any period prior to the consummation of the Merger.

Once a person or group acquires shares meeting the thresholds set forth in paragraphs (A) and (B) immediately preceding, additional acquisitions of such shares by that person or group shall be ignored in determining whether another CIC has occurred. Asset transfers between or among controlled entities as determined before such transfers shall not be considered in applying paragraph (D) immediately preceding. This provision shall be interpreted and administered in a manner consistent with the definition of a "change of control" under Code section 409A.

(8) **"Code"** is the Internal Revenue Code of 1986, as amended and in effect from time to time. Any reference to a specific provision of the Code shall be deemed to refer to successor provisions thereto and the regulations promulgated thereunder.

(9) **"Committee"** is the Committee described in Article IX.

(10) **"Company"** is Pentair, Inc., a Minnesota corporation, or any successor thereto.

(11) **"Disabled"** or **"Disability"** is a physical or mental condition, resulting from physical or mental sickness or injury, which prevents the individual while an Employee from engaging in any substantial gainful activity, and which condition can be expected to last for a continuous period of not less than twelve (12) months. For purposes of applying Section 3.2(c), however, the immediately preceding sentence shall be applied by substituting "six (6) months" for "twelve (12) months."

(12) **"Employee"** is an individual who is (i) employed by a Participating Employer, (ii) a highly compensated or key management employee of a Participating Employer

as determined by the Committee, (iii) in an employment position or salary grade classified by the Company as eligible to participate in the Plan, and (iv) eligible to participate in the RSIP. In the event an individual satisfies the foregoing requirements except he or she is not eligible to participate in the RSIP (e.g., an individual within an employee group to which the RSIP has not been extended), such individual may, in the discretion of the Committee, be considered an Employee solely for purposes of allowing such individual to elect Before-tax Deposits and not for purposes of being eligible for Employer Contributions.

(13) **"Employer"** is the Company and, except as prescribed by the Committee, each other corporation or unincorporated business which is a member of a controlled group of corporations or a group of trades or businesses under common control (within the meaning of Code section 414(b) or (c)) which includes the Company, but with respect to other business entities during only the periods of such common control with the Company.

(14) **"Employer Contributions"** are amounts contributed under the Plan by Participating Employers pursuant to Article IV, and includes **Employer Discretionary Contributions** described in Section 4.1 and **Employer Matching Contributions** described in Section 4.2.

(15) **"Equity Awards"** are share-related awards granted under the Omnibus Incentive Plan that are designated as eligible to be deferred under this Plan in the award letter or other document evidencing such award.

(16) **"ERISA"** is the Employee Retirement Income Security Act of 1974, as amended. Any reference to a specific provision of the Code shall be deemed to refer to successor provisions thereto and the regulations promulgated thereunder.

(17) " **Fair Market Value** " has the meaning ascribed in the Omnibus Incentive Plan.

(18) **"Investment Fund"** is a deemed investment made available by the Committee and selected (or deemed selected) by a Participant for purposes of crediting investment earnings and losses to a Participant's Account.

(19) **"nVent Equity Awards"** are awards relating to nVent Shares granted in connection with an Equity Award at the time of the spin-off of nVent Electric plc from Pentair plc, $0.01.

(21) **"nVent Share Unit"** is a unit that has a value equal to one nVent Share.

(22) **"nVent Share Unit Fund"** is the Investment Fund described in Section 6.2(b), which is deemed invested in nVent Shares.

(23) " **Omnibus Incentive Plan** " is (i) with respect to awards granted prior to the Merger, the Pentair plc 2008 Omnibus Stock Incentive Plan (formerly known as the Pentair,

Inc. 2008 Omnibus Stock Incentive Plan), as it may be amended from time to time, and (ii) with respect to awards granted on or after the Merger, the Pentair plc 2012 Stock and Incentive Plan (formerly known as the Pentair Ltd. 2012 Stock and Incentive Plan), or any successor thereto, as it may be amended from time to time.

(24) **"Participant"** is an individual who has validly elected to participate hereunder and who has elected Before-tax Deposits, deferrals of Equity Awards or is entitled to receive Employer Contributions. An individual who has become a Participant shall continue as a Participant until the earlier of his or her death and the date the balance in his or her Account has been paid.

(25) **"Participating Employer"** is the Company and each other Employer, except as otherwise prescribed by the Committee or the terms of any purchase agreement entered into with respect to the Company's or an affiliates acquisition of such Employer.

(26) " **Performance-Based Compensation** " is Bonus Compensation or Equity Awards the amount of which, or the entitlement to which, is contingent on the satisfaction of preestablished organizational or individual performance criteria relating to a performance period of at least twelve (12) months. Goals are considered preestablished if established in writing no later than ninety (90) days after the commencement of the performance period. Performance-Based Compensation does not include any amount or payment that will be paid either regardless of performance, or based upon a level of performance that is substantially certain to be met at the time the criteria is established. Notwithstanding the foregoing, Bonus Compensation or Equity Awards will be considered Performance-Based Compensation if the compensation will be paid regardless of satisfaction of the performance goals in the event of the Participant's death, Disability or a CIC, provided that payment under such circumstances without regard to the satisfaction of the performance criteria will not constitute Performance-Based Compensation.

(27) **"Plan Year"** is the calendar year.

(28) **"Pre-Deferral Compensation"** is the combined amount of Base and Bonus Compensation which would have been paid in a Plan Year but for a Before-tax Deposit election hereunder or a before-tax deposit election under the RSIP, or both.

(29) " **Re-domicile Date** " is the effective date of the consummation of the merger of Pentair Ltd. with and into Pentair plc.

(30) **"Retirement"** is an individual's Separation from Service on or after the attainment of age fifty-five (55) and the completion of at least ten (10) years of service with one or more Employers.

(31) **"RSIP"** is the Pentair, Inc. Retirement Savings and Stock Incentive Plan, as amended, or any successor plan thereto.

(32) **"Separation Date"** is April 30, 2018, the date upon which nVent Electric plc spun-off from Pentair plc.

(33) **"Separation from Service"** is the termination of employment as an employee, from all business entities that comprise the Employer, for reasons other than death or Disability. A Participant will be deemed to have incurred a Separation from Service when the level of bona fide services performed by the Participant for the Employer permanently decreases to a level equal to twenty percent (20%) or less of the average level of services performed by the Participant for the Employer during the immediately preceding thirty-six (36) month period (or such lesser period of service). Notwithstanding the foregoing, a Participant on a bona fide leave of absence from an Employer shall be considered to have incurred a Separation from Service no later than the six (6) month anniversary of the absence (or twenty-nine (29) months in the event of an absence due to a Disability described in the last sentence of Section 2.1(11)) or the end of such longer period during which the individual has the right by law or agreement to return to employment upon the expiration of the leave. Notwithstanding the foregoing, if following the Participant's termination of employment from the Employer the Participant becomes a non-employee director or becomes or remains a consultant to the Employer, then the date of the Participant's Separation from Service may be delayed until the Participant ceases to provide services in such capacity to the extent required by Code section 409A.

(34) " **Share** " is, following the consummation of the Merger and prior to the Re-domicile Date, a registered share of Pentair Ltd., nominal value CHF 0.50, or, on and after the Re-domicile Date, an ordinary share of Pentair plc, nominal value $0.01. No Shares have been authorized for issuance under this Plan. All Shares payable under this Plan are issued from the Omnibus Incentive Plan.

(35) " **Share Unit Fund** " is the Investment Fund described in Section 6.2(b), which is deemed invested in Shares. The Share Unit Fund shall be used solely as a means to track deferrals of Equity Awards.

(36) " **Share Unit** " is a unit that has a value equal to one Share.

(37) **"Specified Employee"** is a Participant who is a key employee for a Plan Year, with such status as to that period becoming effective as of April 1st next following such Plan Year and lasting until the following April 1st. A key employee is an employee of an Employer who (i) at any time during the Plan Year owns at least five percent (5%) of the stock (or capital or profits interest) of an Employer, (ii) owns one percent (1%) of the stock (or capital or profits interest) of an Employer and whose compensation exceeds the dollar limit for such period described in Code section 416(1)(iii), or (iii) is an officer of an Employer and whose compensation exceeds the dollar limit for such period described in Code section 416(1)(i), as adjusted. No more than the lesser of fifty (50) employees or ten percent (10%) of all employees shall be treated as officers for that period by reason of clause (iii) immediately preceding. In the event the number of officers exceeds such number, the employees included in such number will be those with the highest compensation for that period.

(38) **"Spouse"** is an individual whose marriage to a Participant is recognized under the laws of the United States (or any one of the states) and who is considered the Participant's spouse by the Internal Revenue Service for purposes of the Code.

(39) "Trust" is the Pentair, Inc. Non-Qualified Deferred Compensation Plan Trust.

(40) "Trustee" is the person appointed as the trustee under the Trust.

(41) "Unforeseeable Emergency" is a severe financial hardship to the Participant resulting from: an illness or accident to the Participant or his or her Spouse or tax-dependent; the loss of a home due to an uncompensated (by insurance or otherwise) casualty; and other similar extraordinary and unforeseeable circumstances beyond the control of the Participant.

(42) "Valuation Date" is, with respect to Investment Funds which correspond to funds available under the RSIP, a date as of which such corresponding funds are valued under the RSIP; with respect to other Investment Funds, it is the last day of each Plan Year and such other dates as are prescribed by the Committee.

Section 2.2. Eligibility to Participate.

(a) Eligibility to Make Before-tax Deposits and Deferrals of Equity Awards. Subject to the provisions of Article III, all Employees are eligible to elect Before-tax Deposits and to defer Equity Awards.

(b) Eligibility for Employer Contributions. Employees eligible to receive an Employer Discretionary Contribution for a Plan Year are described in Section 4.1(a), and Employees eligible to receive an Employer Matching Contribution for a Plan Year are described in Section 4.2(a).

(c) Suspension of Eligibility. (1) Failure to Qualify as an Employee. Once an individual becomes an Employee, such individual shall remain an Employee, regardless of the identity of his or her Participating Employer, so long as he or she continues to be described in Section 2.1(12). In the event an individual becomes an Employee and thereafter remains employed by an Employer but not as an Employee or such Employer is not then a Participating Employer, except as directed by the Committee such individual's eligibility to elect Before-tax Deposits or deferrals of Equity Awards shall be suspended at the end of the Plan Year in which such status change occurs and such individual's eligibility to receive an allocation of Employer Contributions shall be suspended immediately on the date such status change occurs.

(2) Resumption. Upon resuming status as an Employee, an individual whose eligibility to participate in the Plan has been suspended may again elect Before-tax Deposits or deferrals of Equity Awards under the Plan pursuant to the provisions of Article III.

Section 2.3. Purpose. As a tax-qualified plan, the RSIP is subject to various Code provisions which limit artificially the contributions which can be made on behalf of participants. The Plan is designed to offer the same contribution formulas (without duplication) as are offered under the RSIP but without regard to such Code provisions, including Code sections 401(a)(17) (compensation cap), 401(k) and 401(m) (annual discrimination tests and related rules for elective and matching contributions), 402(g) and 414(v) (annual dollar limit on elective contributions), and 415(c) (limit on annual additions). In addition, the Plan is designed to offer participants the

ability to defer certain items of compensation that would not be able to be deferred under the RSIP, such as equity awards granted under the Omnibus Incentive Plan. It is intended that all Accounts represent retirement income within the meaning of 4 USC § 114(b)(1)(I)(ii) if paid after termination of employment. The Plan is not solely intended to provide benefits in excess of the Code section 415 limits, however, and therefore it is not an "excess benefit plan" as defined in ERISA section 3(36).

Section 2.4. Construction.

(d) General. Wherever any words are used herein in the singular, masculine, feminine or neuter form, they shall be construed as though they were used in the plural, feminine, masculine or non-neuter form, respectively, in all cases where such interpretation is reasonable. The words "hereof," "herein," "hereunder," and other similar compounds of the word "here" shall mean and refer to this entire document and not to any particular Article or Section. Titles of Articles and Sections are for general information only, and the Plan is not to be construed by reference thereto.

(e) Applicable Law. To the extent not preempted by ERISA or any other federal statute, the Plan shall be construed and its validity determined according to the substantive laws of the State of Minnesota, without reference to conflict of law principles thereof. In case any provision of the Plan shall be held illegal or invalid for any reason, the Plan shall be construed and enforced as if it did not include such provision.

ARTICLE III
PARTICIPANT DEFERRALS

Section 3.1. Election to Participate.

(a) General. (1) Annual Election. Prior to January 1 of each Plan Year, an Employee may elect: (A) to make Before-tax Deposits from his or her Base Compensation that will be earned and paid in such Plan Year, (B) to make Before-tax Deposits from his or her Bonus Compensation that will be earned (or begin to be earned) in such Plan Year, (C) to defer all or a portion of his or her Equity Awards that will be granted in such Plan Year (for this purpose, an Equity Award shall be considered granted when the Company takes action to approve such grant), and (D) the form and time of distribution of the Account with respect to such Plan Year, as permitted by Section 7.1(b). Such election shall be made as of the times the Committee may prescribe and shall be irrevocable as of December 31 of the year immediately preceding the Plan Year for which such elections are effective.

(2) Mid-Year Elections: Bonus Compensation or Equity Award. If and to the extent allowed by the Committee, an Employee also may elect Before-tax Deposits from his or her Bonus Compensation and may elect to defer all or a portion of his or her Equity Awards as follows:

(i) If the Bonus Compensation or Equity Award qualifies as Performance-Based Compensation, the election may be made no later than six (6) months before the end of the performance period; or

(ii) If the Bonus Compensation or Equity Award is subject to a substantial risk of forfeiture that will not lapse until at least thirteen (13) months after the date of award or grant (or earlier upon death, Disability or a CIC), the election may be made no later than the first thirty (30) days after the date of award or grant; provided that if the Bonus Compensation actually vests within the first thirteen (13) months by reason of the Employee's death, Disability, or a CIC, then the deferral election shall be cancelled; or

(iii) If the Bonus Compensation or Equity Award is subject to a substantial risk of forfeiture that will not lapse until at least one year after the date of grant, the election may be made at least one year prior to the date such award will vest, provided that the amount is deferred for a minimum of five (5) years from the date the Bonus Compensation or Equity Award vests.

Such election shall be made as of the times the Committee may prescribe and shall be irrevocable as of the latest date permitted hereunder. If an Employee has not previously elected a time and form of distribution with respect to the Account to which the deferrals described herein will be credited, he or she may do so as part of his or her deferral election hereunder.

(b) Participation During Plan Year .

(1) Initial Participation . An Employee who first becomes eligible to participate in the Plan during a Plan Year may elect, within the first thirty (30) days of becoming so eligible, (A) Before-tax Deposits from his or her Base Compensation for that Plan Year earned and paid after such election, and (B) the form and time of distribution of the Account with respect to such Plan Year, as permitted by Section 7.1(b). Such individual may also make the elections described in Section 3.1(a)(2), if applicable.

(2) Resumption of Participation . An individual who has been eligible to participate in the Plan, who loses such eligibility by reason of a Separation from Service or otherwise, and who again becomes eligible to participate in the Plan, shall not be eligible to participate in the Plan for purposes of authorizing Before-tax Deposits or deferrals of Equity Awards, and shall not be eligible to receive an allocation of Employer Contributions, for the Plan Year in which he or she again becomes so eligible unless he or she (i) has not been eligible to make Before-tax Deposits or deferrals of Equity Awards for two (2) or more consecutive years or (ii) has previously incurred a Separation from Service and been paid all benefits under the Plan after such separation and before again becoming eligible for the Plan.

(c) nVent Equity Awards . Deferral elections for Equity Awards outstanding as of the Separation Date shall automatically apply to related nVent Equity Awards.

Section 3.2. Amount of Participant's Deferrals.

(a) Deferral Elections . At the time an Employee elects to make Before-tax Deposits or defer an Equity Award for a Plan Year, he or she shall designate the percentage of Base Compensation, Bonus Compensation, or Equity Awards to be deferred. Except as described subsection (c), the percentage elected shall be irrevocable with respect to the compensation to which it relates. In the event a payroll period with respect to Base Compensation straddles the end of a Plan Year, the election, if any, to defer for the Plan Year in which the payroll period ends shall control the amount or rate to be deferred.

(b) Maximum Deferrals and Coordination with the RSIP . The maximum deferrals which may be elected by a Participant for a Plan Year shall be established from time to time by the Committee and may be expressed as a maximum amount or percentage. Different maximums may be applied to deferrals of Base, Bonus Compensation, and Equity Awards or different items of Bonus Compensation and Equity Awards. Such maximums shall be established before a Plan Year and shall apply throughout that year, or shall apply to the award to which the maximum relates. Any such maximums on Base and Bonus Compensation shall be first absorbed by Before-tax Deposits and then, to the extent the maximum has not been reached, by before-tax deposits under the RSIP.

(c) Intra-Year Cessation of Before-tax Deposits . In the event a Participant dies, becomes Disabled, or, as directed by the Committee, applies for and is granted a distribution pursuant to Article VIII, Before-tax Deposits on behalf of such Participant for the balance of the Plan Year shall be suspended. The suspension shall be effective no later than the second payroll period ending after the Participant's death; two and one-half (2-1/2) months after

the Participant becomes Disabled; or the second payroll period ending after the Committee approves the distribution and directs the suspension, whichever is applicable.

Section 3.3. Payment of Deposits to Trustee. Unless otherwise directed by the Committee, a Participating Employer shall remit amounts withheld as Before-tax Deposits to the Trustee as soon as administratively feasible after such amounts are withheld. In the event the Committee so otherwise directs or if the Trust (or some other funding arrangement) does not then exist, then the amounts so withheld shall be retained by the Participating Employer as part of its general assets and, in order to determine investment earnings and losses thereon, shall be allocated to one or more Investment Funds as determined by the Committee no later than the first day of the second calendar month immediately following the calendar month of such withholding.

ARTICLE IV
EMPLOYER CONTRIBUTIONS

Section 4.1. Employer Discretionary Contribution.

(a) Eligibility for Employer Discretionary Contributions . Employees eligible to receive an Employer Discretionary Contributions for a Plan Year shall be those individuals

(i) eligible to elect Before-tax Deposits for that year;

(ii) who are eligible to receive an employer discretionary contribution under the RSIP for that year;

(iii) whose covered compensation under the RSIP for that Plan Year is:

(1) actually limited by the applicable dollar amount provided for under Code section 401(a)(17), or

(2) reduced by reason of Before-tax Deposits; and

(iv) who are employed by an Employer as of the end of that Plan Year; provided, however, that such year-end employment shall not be required for the year in which employment ends due to death, Disability, or Retirement.

(b) Amount of Discretionary Contribution . Participating Employers shall make an Employer Discretionary Contribution on behalf of their eligible Employees for a Plan Year in an amount equal to (i) the employer standard discretionary contribution rate in effect under the RSIP for the Plan Year (as determined by the Committee) multiplied by the eligible Employee's Pre-Deferral Compensation for the Plan Year, up to the applicable dollar limit under Section 4.3, less (ii) the employer standard discretionary contribution (as determined by the Committee) made on behalf of such Employee to the RSIP for that year.

Section 4.2. Employer Matching Contribution.

(a) Eligibility for Employer Matching Contributions . Employees eligible to receive an Employer Matching Contribution for a Plan Year shall be those individuals

(i) who are eligible to receive an employer matching contribution under the RSIP for such year;

(ii) whose covered compensation under the RSIP for that Plan Year is:

(1) actually limited by the applicable dollar amount provided for under Code section 401(a)(17), or

(2) reduced by reason of Before-tax Deposits; and

(i) who are employed by an Employer as of the end of that Plan Year; provided, however, that such employment shall not be requested for the year in which such employment ends due to death, Disability, or Retirement.

(b) Amount of Matching Contribution . With respect to each Employee eligible to receive an Employer Matching Contribution for a Plan Year, that Employee's Participating Employer shall contribute a matching contribution equal to A - B, where A equals the matching contribution which would have been made on his or her behalf under the RSIP for that year assuming:

(i) the covered compensation limit thereunder was the applicable dollar limit for that year under Section 4.3,

(ii) the provisions of Code sections 401(k) and (m), 402(g), 414(v), and 415(c) (and any similar or analogous Code limits on the amount or rate of contributions under the RSIP) did not apply,

(iii) all Before-tax Deposits for such year had been made for that year under the RSIP,

(iv) covered compensation thereunder included Before-tax Deposits made with respect to that year, and

B equals the matching contributions made on his or her behalf under the RSIP for that year. In determining B, payment of the matching contribution to the Employee under the RSIP to satisfy Code section 401(m) shall be ignored but any forfeiture of such contribution shall, if in fact taken into account in determining B, reduce B.

Section 4.3 Limit on Compensation for Purposes of Employer Contributions.
The maximum amount of the aggregate of a Participant's Base Compensation and Bonus Compensation that will be considered for purposes of determining Employer Contributions shall be established from time to time by the Committee and shall be communicated to the Participants. For the Plan Year beginning January 1, 2008, the maximum amount of the aggregate of a Participant's Base Compensation and Bonus Compensation for purposes of determining Employer Contributions shall be $700,000.

Section 4.4 Payment of Deposits to Trustee.
Unless otherwise directed by the Committee, a Participating Employer shall pay its share of the Employer Contributions for a Plan Year as soon as administratively feasible after the entire Employer Contribution for such year has been determined. In the event the Committee so otherwise directs or if the Trust (or some other funding arrangement) does not then exist, then such share shall be retained by the Participating Employer as part of its general assets and, in order to determine investment earnings and losses thereon, shall be allocated to one or more Investment Funds as determined by the Committee no later than the first day of the calendar month immediately following the calendar month in which such entire Contribution has been determined.

ARTICLE V.
TRUSTEE AND TRUST AGREEMENT

Section 5.1 Appointment.

(a) General . The Plan is an unfunded deferred compensation arrangement. Neither the Company nor any Participating Employer shall be required to establish a trust or to in any way segregate assets for purposes of funding or otherwise providing benefits under the Plan. The Company may, however, in its sole discretion, establish and maintain an unfunded grantor trust with one or more persons selected by the Committee to act as Trustee. If a Trustee is so appointed, such Trustee shall hold, manage, administer and invest the assets of the Trust, reinvest any income, and make distributions in accordance with the directions of the Committee and the provisions of the Plan and Trust. The trust agreement shall be in such form and contain such provisions as the Committee deems necessary and appropriate to effectuate the purposes of the Plan. The terms and provisions of the trust agreement shall control in case of a conflict between the terms and provisions of such agreement and the terms and provisions of the Plan.

(b) Removal and Resignation . Pursuant to the notice requirements and other procedures contained in the Trust agreement, and in accordance with the Trust agreement, the Committee may, at any time and from time to time, remove a Trustee or any successor Trustee and any such Trustee or any successor Trustee may resign. If the provisions of the Trust agreement remain in effect at the time of removal or resignation of the Trustee, the Committee shall appoint a successor Trustee.

Section 5.2 Fees and Expenses. Except as directed by the Company, the Trustee's fee, and related fees and expenses, shall be paid by the Company and Participating Employers. Brokerage fees, asset-based fees for custodial, investment and management services, and other investment expenses (e.g., participant record-keeping fees) which relate to Investment Funds, shall be paid out of the Trust and charged to the fund of the Trust and the Accounts of the Participant to which such fees and costs are attributable.

Section 5.3 Use of Trust. To the extent any assets are held in the Trust, such assets shall at all times be the property of the Company or a Participating Employer and, as such, shall remain subject to the claims of general creditors of the Company or the Participating Employer, as the case may be, in the event of bankruptcy or insolvency. No Participant or Beneficiary shall by reason of the Plan and Trust have any rights to any assets of the Trust, the Company or a Participating Employer nor to Investment Funds or other property generally, and neither the existence of the Plan nor the establishment of a Trust shall be interpreted or construed as a guaranty that any funds which may be held in trust will be available or sufficient for the payment of benefits under the Plan.

Section 5.4 Responsibility and Authority for Fund Management. The Company may, in its sole discretion, establish and maintain a funding policy, and may delegate to the Committee the following duties and authority:

(i) to establish Investment Funds for purposes of crediting investment earnings and losses to Accounts, including the authority to add to or change the number and nature of the Investment Funds from time to time;

(ii) to direct the investment and reinvestment of all or any portion of the assets, if any, held by the Trustee under the Trust; and

(iii) to periodically review the performance of the Investment Funds.

Section 5.5 Trust Assets. Neither the Company, a Participating Employer nor the Trustee shall be obligated to purchase any asset or Investment Fund designated by a Participant pursuant to the provisions of Article VI for purposes of crediting investment earnings and losses to such Participant's Accounts. To the extent the Company and Participating Employers remit Before-tax Deposits or Employer Contributions to the Trustee, however, and the Investment Fund designated by the Participant as a deemed investment for his or her Accounts consists of an asset which the Trustee cannot purchase or an investment which is not readily available on the open market, the Trustee shall, subject to the direction of the Committee, return any such amounts to the Company and Participating Employers in the form of cash. To the extent a Participant reallocates all or a portion of the balance in his or her Accounts into an Investment Fund which consists of an asset the Trustee cannot purchase, the Trustee shall withdraw from the Trust cash equal to the fair market value of such investment designation and return such cash to the Company or other Participating Employers.

ARTICLE VI
INVESTMENT; PARTICIPANT'S ACCOUNTS

Section 6.1 Allocation and Reallocation of Before-Tax Deposits and Employer Contributions.

(a) Allocation. For purposes of crediting earnings to his or her Accounts, a Participant shall elect to allocate Before-tax Deposits and Employer Contributions to one or more of the Investment Funds. A Participant may elect to change the mix of such allocations in accordance with rules prescribed by the Committee. An election under this Section 6.1(a) shall remain in effect unless changed by the Participant; provided, however, that neither the Company, a Participating Employer, the Committee nor the Trustee shall be obligated to purchase any investment designated by a Participant. Investment Funds are selected by a Participant solely for purposes of determining the investment earnings and losses to be credited to a Participant's Accounts.

(b) Reallocation. In accordance with rules prescribed by the Committee, a Participant may reallocate the balance credited to his or her Accounts among the available Investment Funds. Any such reallocation shall apply to the entire balance of such Accounts attributable to participation in the Plan, and not just to Before-tax Deposits and Employer Contributions made subsequent to such reallocation.

(c) Participant-Directed Investment. (1) General. The availability of Investment Funds for purposes of crediting earnings to Accounts is not a recommendation to designate a deemed investment in any one Investment Fund. The selection of deemed investments is solely the responsibility of each Participant. No officer, employee or other agent of an Employer or the Trustee is authorized to advise or make any recommendation concerning the selection of Investment Funds and no such person is responsible for determining the suitability or advisability of any such selection.

(2) Participant Responsibility. Participants shall be solely responsible for selecting, monitoring, and changing the Investment Funds in or by which their Account balances are invested. Neither the Company, a Participating Employer, Committee member, nor the Administrator shall be responsible for such investment decisions. To the extent a Participant does not expressly exercise investment discretion over his or her Accounts, he or she shall be deemed to have elected to direct investments to or by the same Investment Fund used for such purposes under the RSIP, except as otherwise provided by the Committee.

Section 6.2. Allocation of Deferred Equity Awards.

(a) Allocation. Deferrals of Equity Awards shall be automatically allocated to the Share Unit Fund (or the nVent Share Unit Fund, as the case may be) on the date of vesting, unless otherwise determined by the Committee. A Participant shall not have the right to re-allocate such deferrals out of the Share Unit Fund (or the nVent Share Unit Fund).

(b) Share Unit Fund. A deferral of an Equity Award shall be allocated to the Share Unit Fund as follows: (i) if the deferral relates to Shares, or Equity Awards whose value equals the Fair Market Value of a Share, the Participant's Account shall be credited with a

number of Shares Units equal to the number of Shares (or Share-related Equity Awards) deferred, or (ii) if the deferral relates to cash (such as dividend equivalents), such amount shall be converted to whole and fractional Share Units, with fractional units calculated to three decimal places, by dividing the amount to be allocated by the Fair Market Value of a Share on the effective date of such allocation. A deferral of an nVent Equity Award shall be allocated in a similar manner to the nVent Share Unit Fund.

As of the Separation Date, with respect to each Share Unit credited to the Participant's Account, one nVent Share Unit shall be credited.

If any dividends or distributions (other than in the form of Shares) are paid on Shares while a Participant has Share Units credited to his Account, such Participant shall be credited with additional Shares Units equal to the amount of the cash dividend paid or Fair Market Value of other property distributed on one Share, multiplied by the number of Share Units credited to the Participant's Account on the date the dividend is declared. A similar rule shall apply to nVent Share Units credited under the nVent Share Unit Fund when dividend or distributions (other than shares) are paid on nVent Shares.

Any other provision of this Plan to the contrary notwithstanding, if a dividend is paid on Shares in the form of a right or rights to purchase shares of capital stock of the Company or any entity acquiring the Company, no additional Share Units shall be credited to the Participant's Account with respect to such dividend, but each Share Unit credited to a Participant's Account at the time such dividend is paid, and each Share Unit thereafter credited to the Participant's Account at a time when such rights are attached to Shares, shall thereafter be valued as of any point in time on the basis of the aggregate of the then Fair Market Value of one Share plus the then Fair Market Value of such right or rights then attached to one Share.

(c) Transactions Affecting Shares. In the event of any transaction affecting Shares that would cause an adjustment to be made under the adjustment provisions of the Omnibus Incentive Plan, the Committee may make appropriate equitable adjustments with respect to the Share Units credited to the Account of each Participant, including without limitation, adjusting the date as of which such units are valued and/or distributed, as the Committee determines is necessary or desirable to prevent the dilution or enlargement of the benefits intended to be provided under the Plan. A similar rule shall apply with respect to units credited under the nVent Share Unit Fund.

(d) No Shareholder Rights With Respect to Share Units. Participants shall have no rights as a stockholder pertaining to Share Units credited to their Accounts.

Section 6.3. Investment of Deposits and Employer Contributions. The Committee may, in its discretion, direct the Trustee to invest a Participant's Before-tax Deposits and Employer Contributions in the Investment Funds designated by the Participant, to the extent such investment is available on the open market and can be purchased by the Trustee and owned by the Trust. Regardless of whether any deposits or Employer Contributions are actually invested in the Investment Funds designated by Participants, however, the Committee shall maintain a bookkeeping account on behalf of each Participant to which shall be credited the investment results of each Investment Fund so designated to adjust the amounts in each Participant's

Accounts. At least each calendar quarter, the Committee shall make available or cause to be made available a report or other information indicating the increase or decrease in the value of each Participant's Accounts. Any earnings of an Investment Fund shall be deemed to be reinvested in the same Investment Fund for purposes of maintaining a Participant's Accounts.

Section 6.4. Participant's Accounts.

(a) Establishment of Accounts . Separate Accounts shall be established and maintained for each Participant by Plan Year and Investment Fund. To the extent necessary or appropriate to provide for proper administration of the Plan, including the tracking of payment date and form elections, a Participant's Account for a Plan Year shall include separate balances or subaccounts for interests derived from Before-tax Deposits, deferred Equity Awards, Employer Contributions and such other separate balances as the Committee shall determine. The Committee shall also identify or otherwise maintain separate Accounts or subaccounts for Participants by reference to the identity of the Participant's Employer, to the extent practicable.

(b) Crediting of Accounts . The appropriate Accounts of each Participant shall be credited with the amounts of Before-tax Deposits, deferred Equity Awards and Employer Contributions made for each Plan Year. The reallocation of a Participant's Accounts, if permitted, shall be appropriately credited as of the Valuation Date coincident with or next following the effective date of the reallocation. The maintenance of such Accounts shall not, however, entitle a Participant to any ownership, preferred claim or beneficial interest in any Investment Fund or in any specific asset of the Trust. Investment Funds are deemed investments and used solely for purposes of determining the earnings and losses to be credited to a Participant's Accounts.

(c) Vesting of Accounts . A Participant's Account shall be fully vested, except that the portion of the Account arising from the deferral of an Equity Award shall vest in accordance with the terms of the Equity Award to which it relates.

Section 6.5. Beneficiaries. The foregoing provisions of this Article VI shall be applied, to the extent relevant, with respect to Accounts payable under the Plan to a Beneficiary of a deceased former Participant.

ARTICLE VII
PAYMENT OF ACCOUNTS

Section 7.1. Time and Form of Payments.

(a) General. Except as otherwise provided in the Plan, a Participant shall receive his or her entire vested Account balance allocable to a Plan Year in a lump sum within ninety (90) days of the first to occur of his or her (i) Separation from Service, (ii) Disability, or (iii) a CIC. In the event the payment event is due to a Separation from Service and as of the date of the Separation from Service the Participant is a Specified Employee, however, the lump sum shall be paid within thirty (30) days after the six (6) month anniversary of such date.

(b) Election of Distribution. A Participant may elect, in accordance with Section 3.1 and subject to such limitations as may be prescribed by the Committee, to receive distribution of his or her vested Account balance allocable to a Plan Year:

(1) Time of Payment. As of one specific future date, provided such date is at least two (2) years following the last date by which such an election can be made for that year (or with respect to the portion of the Account relating to an Equity Award, the date the award is fully vested, if later) and such date cannot be more than five (5) years after the earlier of the date the Participant becomes Disabled and the date he or she has a Separation from Service. In the event the date finally selected is less than two (2) years, the Participant shall be treated as having not made a specific date election for that year, or, by reason of subsequent event, is more than five (5) years after the relevant date, the Participant shall be treated as having selected the fifth (5th) anniversary of such date as the date of payment. Except as provided in Section 8.5, such an election once finally effective cannot be changed by the Participant.

(2) Calculation of Payment. In annual installments over five (5) or ten (10) years. Each such installment shall be determined by using the vested Account balance for such year as of the most recent Valuation Date before the payment date and dividing such balance by the number of years left in the installment period and the final installment shall include the remaining vested Account balance. The second year and later installments shall be paid, as far as practicable, on the anniversary date of the first installment. Except as provided in Section 7.4, such an election once finally effective cannot be changed by the Participant. In the event the payment event is due to a Separation from Service, and as of the date of Separation from Service the Participant is a Specified Employee, however, the first installment payment may not be made until after the six (6) month anniversary of such date.

(c) Form of Payment. All payments made under a Participant's Account, other than from the Share Unit Fund, shall be made in cash. Payment from the Share Unit Fund shall be distributed in the form of Shares, with each whole Share Unit being paid in the form of one Share, and payment from the nVent Share Unit Fund shall be distributed in the form of nVent Shares, with each whole nVent Share Unit being paid in the form of one nVent Share. Fractional Share Units shall be distributed in cash by multiplying the fractional Share Unit (or nVent Share Unit, if applicable) by the Fair Market Value of a Share (or an nVent Share)

immediately prior to the date of payment. All Shares payable under the Plan shall be issued from the relevant Omnibus Incentive Plan.

Section 7.2 Distribution Due to Death.

(a) Death Benefit. If a Participant dies before receiving payment of all of the vested amounts allocated to his or her Accounts, then notwithstanding the payment dates or forms of payment elected, and regardless of whether the Participant had Separated from Service before death or was a Specified Employee as of such separation, all such unpaid benefits shall be paid to his or her Beneficiary within ninety (90) days of the date of death. Notwithstanding the foregoing, the Employer shall not be obligated to make payment to a Beneficiary (and will not be liable for any failure to make distribution within ninety (90) days of the date of death) unless and until the Committee has verified the identity of the Beneficiary and the Beneficiary has established the right to receive payment of such benefits.

(b) Default . If a Participant fails to make a valid Beneficiary designation, makes such a designation but is not survived by any named Beneficiary, or makes such a designation but the designation does not effectively dispose of all benefits payable after the Participant's death, then, to the extent benefits are payable after the Participant's death, all such benefits shall be paid to the Participant's Spouse (if the Spouse survives the Participant), or if the Participant has no Spouse or such Spouse does not survive the Participant, the personal representative or equivalent of the Participant's estate or, if no such person has been appointed, then in accordance with the laws of intestate succession of the jurisdiction in which the Participant was domiciled as of the date of death.

(c) Form of Distribution . Distribution to a Beneficiary shall be made in a lump sum in cash or Shares (including, if applicable, nVent Shares) in accordance with Section 7.1(c).

(d) Death of Beneficiary . If a Beneficiary dies after the Participant but before receiving payment of all benefits under the Plan which would have been paid to such Beneficiary but for his or her death, then all such unpaid benefits shall be paid within ninety (90) days after such death to the personal representatives or equivalent of such beneficiary's estate. Notwithstanding the foregoing, the Employer shall not be obligated to make payment to the beneficiary's estate (and will not be liable for any failure to make distribution within ninety (90) days of the date of death) unless and until the Committee has verified the identity of such representative.

Section 7.3. Payment of Employer Contributions.

To the extent a Participant or Beneficiary, as the case may be, has received or commenced receiving benefits hereunder, and the Participant or former Participant is subsequently determined to be entitled to an allocation of Employer Contributions for the Plan Year in which the Participant's active participation in the Plan ceased, then the Company or Participating Employer shall timely pay any such contribution to such person or, if such person is receiving an installment form of distribution, the Committee shall adjust the balance of the installments due to reflect the amount of such Employer Contribution effective with the due date of the next installment payment. Any such amount shall remain subject to all applicable provisions of the Plan until so paid.

Section 7.4. Later Payment Deferral Elections.

(a) General. A Participant who elected a specific payment date pursuant to Section 7.1(b) may, in accordance with the provisions of this Section 7.4 and while an Employee, elect to change the date or form, or both, of payment of the vested Account balance allocable to a Plan Year. No more than two (2) such elections shall be allowed as to the Account balance for a Plan Year.

(b) Election Rules. The later election must be otherwise valid pursuant to Section 7.2(b), as if an original election, and must be (i) made at least one (1) year before the then scheduled payment date and (ii) extend the then scheduled payment date by five (5) or more years.

(c) Form of Payment. For purposes of applying this Section 7.4 and implementing the six (6) month delay rule for Specified Employees, each of the forms of payment awards under the Plan shall be treated as a single payment due to be made as of the first scheduled payment date.

Section 7.5. Miscellaneous.

(a) De Minimis Amount Payout. In the event a Participant who has a Separation from Service has a vested Account balance or portion thereof for all years which in the aggregate (under all such arrangements treated as the same plan for this purpose under Section 409A and the Treasury Regulations thereunder) is $17,500 or less (or such higher amount described in Code section 402(g)(1)(B) as then in effect) or less, the Committee may, in its discretion, cause such vested balance (and the balances of any other arrangements treated as the same plan) to be distributed in a lump sum immediately following the Participant's Separation from Service, notwithstanding any other provision of the Plan or the Participant's distribution elections.

(b) Permissible Delay and Acceleration. The payment provisions of Article VII are subject to exceptions or overrides in the discretion of the Committee or other person, other than the Participant concerned, as otherwise provided in the Plan or as allowed under Code section 409A.

ARTICLE VIII
EMERGENCY WITHDRAWALS

Section 8.1 Restricted Withdrawals.

(a) General. A Participant who is not otherwise then entitled to an immediate lump sum distribution may, upon a showing of an Unforeseeable Emergency which cannot be satisfied by other available liquid assets, request a withdrawal from the Participant's vested Account balance, but excluding amounts allocated to the Share Unit Fund. An emergency withdrawal cannot be requested more frequently than once each Plan Year.

(b) Determination. The Committee or its delegate shall determine whether the relevant facts and circumstances represent an Unforeseeable Emergency and the amount necessary to satisfy such need. The Committee may require such proof as it deems appropriate to evidence the existence of and the amount necessary to satisfy the emergency or extraordinary circumstances, including a certification that the need cannot be relieved (i) through reimbursement from insurance, (ii) by reasonable liquidation of other assets (but such available assets shall be determined without regard to the Participant's account balances under the RSIP and the Plan, whether attributable to amounts deferred before 2005 or after 2004), or (iii) by cessation of Before-tax Deposits. If and to the extent the cessation of Before-tax Deposits can remedy such need, the Committee may direct such immediate cessation and suspend the Participant's right, for such period of time as it deems appropriate, to elect Before-tax Deposits.

(c) Time for Payment. Distributions pursuant to this Article shall be made in cash within ninety (90) days after the withdrawal is approved by the Committee. If a Participant should die after requesting an emergency withdrawal, but prior to the distribution thereof, the withdrawal election shall be deemed revoked.

(d) Committee Discretion. Approval of an emergency withdrawal shall be in the sole discretion of the Committee, and no such approval shall be given if the Committee determines that allowing such withdrawal may have an adverse tax consequence to the Company, Participating Employers, the Plan or other Participants. In the Committee's sole discretion, such approval may require the suspension of a Participant's right to elect Before-tax Deposits for such period of time as the Committee directs.

ARTICLE IX
PLAN ADMINISTRATION

Section 9.1. Committee.

(a) General . The Committee shall consist of the persons listed on Schedule 3. The Committee shall have exclusive responsibility for the general administration and operation of the Plan and the power to take any action necessary or appropriate to carry out such responsibilities. In addition, the Committee shall provide generally for the operation of the Plan and be a liaison between Employers to assure uniform procedures as appropriate. The duties of the Committee shall include, but not be limited to, the following:

(i) to prescribe, require and use appropriate forms;

(ii) to formulate, issue and apply rules and regulations;

(iii) to prepare and file reports, notices and any other documents relating to the Plan which may be required by law;

(iv) to interpret and apply the provisions of the Plan;

(v) to authorize and direct benefit payments.

In exercising such powers and duties, and other powers and duties granted under the Plan or Trust to the Committee, the Committee and each member thereof is granted such discretion as is appropriate or necessary to carry out the duties and powers so delegated. This discretion necessarily follows from the fact that the Plan, the Trust and related documents do not, and are not intended to, prescribe all rules necessary to administer the Plan or anticipate all circumstances or events which may arise in the course of such administration.

(b) Code Section 409A . The Plan shall be administered, and the Committee, its delegate and the Administrator shall exercise their discretionary authority under the Plan, in a manner consistent with Code section 409A. Any permissible discretion to accelerate or defer a Plan payment under such Regulations, the power to exercise which is not otherwise described expressly in the Plan, shall be exercised by the Committee. In the event the matter over which such discretion may be exercised relates to a Committee member, or such member is otherwise unable to fairly exercise such discretion, such member shall not take part in the deliberations and decisions regarding that matter.

(c) Allocation to Participating Employers . To the extent practicable, the Committee shall account for the Trust assets in such manner as will permit the accurate allocation of Accounts or parts thereof, including the investment earnings and losses attributable thereto, to the relevant Participating Employer. The Committee shall provide to each Participating Employer all information necessary to permit each such Employer to prepare any reports or tax filings which may be required by reason of its status as a Participating Employer.

(d) Action by Compensation Committee of the Board . Notwithstanding the foregoing, if any action or determination of the Committee as set forth in the Plan is required to

be taken by the Compensation Committee of the Board of Directors of the Company in order to comply with applicable law, the Company's governance charters or the listing requirements of any exchange on which the Company's (or an affiliate's) stock is then listed, then all references herein to the "Committee" shall include the Compensation Committee of the Board to the extent deemed necessary or advisable.

Section 9.2. Organization and Procedure. The Committee may have a chairman, a secretary, and such other officers as it deems appropriate. Subject to Section 9.1, action on any matter shall be taken on the vote of at least a majority of all members of the Committee at any meeting or upon unanimous written consent of all members without a meeting. The Committee may adopt such bylaws, procedures and operating rules as it deems appropriate.

Section 9.3. Delegation of Authority and Responsibility. The Committee may, in writing, delegate to any one or more of its members the authority to execute documents on behalf of the Committee and to represent the Committee in any matters or dealings involving such Committee.

The Committee may delegate in writing certain of its powers to a person employed by an Employer under such terms and conditions as may be specified by the Committee. Employees of an Employer who are not members of the Committee or persons to whom powers are delegated, shall perform such duties and functions relating to the Plan as the Committee may direct and supervise. It is expressly provided, however, that the Committee shall retain full and exclusive authority and responsibility for and respecting any such activities by other employees, and nothing contained in this Section 9.3 shall be construed to confer upon any such employee any discretionary authority or control respecting the administration or operation of the Plan.

Section 9.4. Use of Professional Services.
The Committee may obtain the services of such attorneys, accountants, record keepers or other persons as it deems appropriate, any of whom may be the same persons who are providing services to an Employer. In any case in which the Committee utilizes such services, it shall retain exclusive discretionary authority and control over the administration and operation of the Plan.

Section 9.5. Fees and Expenses.
Committee members who are employees of the Company or a Participating Employer shall serve without compensation but shall be reimbursed for all reasonable expenses incurred in their capacity as Committee members. No employee members of the Committee or persons performing services pursuant to Section 9.4 shall receive greater than reasonable compensation for their services. All compensation for services and expenses shall be paid from the Trust unless the Company, in its sole discretion, elects to pay them. To the extent not paid by the Company, such compensation and expenses shall be paid out of the principal or income of the Trust and charged to Accounts.

Section 9.6. Communications.
Requests, claims, appeals, and other communications related to the Plan and directed to the Company or the Committee shall be in writing and shall be made by transmitting the same via the U.S. Mail, certified, return receipt requested, to the Sidekick Committee, c/o Senior Vice President of Human Resources, at the address listed in the latest summary description for the Plan.

Section 9.7. Claims.

(a) Filing Claims. A Participant or Beneficiary (or a person who in good faith believes he or she is a Participant or Beneficiary, i.e., a "claimant") who believes he or she has been wrongly denied benefits under the Plan may file a written claim for benefits with the Administrator. Although no particular form of written claim is required, no such claim shall be considered unless it provides a reasonably coherent explanation of the claimant's position.

(b) Decision on Claim. The Administrator shall in writing approve or deny the claim within sixty (60) days of receipt, provided that such sixty (60) day period may be extended for reasonable cause by notifying the claimant. If the claim is denied, in whole or in part, the Administrator shall provide notice in writing to the claimant, setting forth the following:

(1) the specific reason or reasons for the denial;

(2) a specific reference to the pertinent Plan provisions on which the denial is based;

(3) a description of any additional material or information necessary for the claimant to perfect the claim and an explanation of why such material is necessary; and

(4) the steps to be taken if the claimant wishes to appeal the decision to the Committee.

(c) Appeal of Denied Claim. (1) Filing Appeals. A claimant whose claim has been denied in whole or in part may appeal such denial to the Committee by filing a written appeal with the Administrator within sixty (60) days of the date of the denial. A decision of the Administrator which is not appealed within the time herein provided shall be final and conclusive as to any matter which was presented to the Administrator.

(2) Rights on Appeal. A claimant (or a claimant's duly authorized representative) who appeals the Administrator's decision shall, for the purpose of preparing such appeal, have the right to review any pertinent Plan documents, and submit issues and comments in writing to the Committee.

(d) Decision by Appeals Committee. The Committee shall make a final and full review of any properly appealed decision of the Administrator within sixty (60) days after receipt of the appeal, provided that such period may be extended for reasonable cause by notifying the claimant. The Committee's decision shall be in writing and shall include specific reasons for its decisions and specific references to the pertinent Plan provisions on which its decision is based.

ARTICLE X
PLAN AMENDMENTS, PLAN TERMINATION, AND MISCELLANEOUS

Section 10.1 Amendments and Termination.

(a) General. While it is intended the Plan shall continue in effect indefinitely, the Company may from time to time modify, alter or amend the Plan or the Trust, provided that no amendment affecting the rights, duties or responsibilities of the Trustee may be made without the Trustee's consent. Except as otherwise inconsistent with Section 9.1(b), the Company may at any time order the temporary suspension or complete discontinuance of Before-tax Deposits, deferrals of Equity Awards or Employer Contributions, or may terminate the Plan. Except as described in subsection (b) following, no such amendment shall reduce the balance in any Participant's Accounts determined as of the later of the date the amendment is adopted or effective.

(b) Amendments to Comply with Applicable Law. Nothing herein shall be construed to prevent any modification, alteration or amendment of the Plan or Trust which is required to comply with the provision of any applicable law or regulation relating to the establishment or maintenance of this Plan and Trust. Except as otherwise provided herein, or as necessary to comply with such law or regulation, no such amendment shall reduce the balance in any Participant's Accounts determined as of the later of the date the amendment is adopted or effective.

(c) Participating Employers. An Employer may become a Participating Employer by agreeing to withhold and make contributions for its Employees as provided for herein. An Employer which becomes a Participating Employer thereby agrees to pay or provide for the payment of benefits hereunder to those Participants (and their Beneficiaries) employed by it, but only to the extent such benefits are attributable to contributions, and investment earnings and losses credited thereon, related to the period of such employment. A Participating Employer shall have no discretionary authority or control over the administration of the Plan or the Fund.

An Employer, other than the Company, which becomes a Participating Employer thereby agrees that any subsequent modifications, alterations and amendments to the Plan by the Company shall be deemed to have been adopted by the Participating Employer.

An Employer, other than the Company, may cease to be a Participating Employer by adopting a written resolution of its board of directors and delivering such resolution to the Committee. No resolution ending participation in the Plan shall be effective until thirty (30) days after it is received by the Committee. Unless otherwise provided herein, ceasing to be a Participating Employer shall not relieve such Employer of its obligation hereunder to provide for the payment of benefits credited to Accounts on behalf of Participants during the time such Employer was a Participating Employer.

(d) Plan Termination. If the Plan is terminated, the Committee may elect to either terminate or retain the Trust. Any decision to terminate the Plan or the Trust shall not reduce the balance of a Participant's Accounts under the Plan as of the effective date of such

termination, nor shall it terminate, amend or otherwise change the liability of the Company or Participating Employer to pay or provide for the payment of benefits under the Plan.

Section 10.2 Non-Guarantee of Employment.

Nothing contained in this Plan shall be construed as a contract of employment between an Employer and a Participant, or as a right of any Participant to be continued in the employment of an Employer, or as a limitation on the right of an Employer to discharge any Participant with or without notice or with or without cause.

Section 10.3 Rights to Trust Asset.

(a) Rights of Participants . No Participant or any other person shall have any right to, or interest in, any part of the Trust assets upon termination of employment or otherwise, except as otherwise provided under the Plan. If the assets of the Trust are insufficient to pay the vested amounts credited to a Participant's Accounts, the Participant's Employer shall pay any such amounts from its other general assets. If such Employer does not timely pay such benefits, then, except as described in Section 10.3(b), the sole recourse of a claimant Participant or Beneficiary shall be against such Employer and neither the Company nor any other Employer shall be responsible to pay or provide for the payment of such benefits or liable for the nonpayment thereof.

(b) Company Assumption of Liability . If the Participant's employment is terminated due to the sale of the stock (or rights analogous to stock) or assets of his or her Employer by the Company, the Company shall assume and be responsible for the payment of benefits to such Participant as necessary pursuant to this Section 10.3 even though it may not have been such Participant's Employer. The Company's obligation under this Section 10.3(b) shall cease as of the earlier of the date all such benefits are paid to the affected Participant or the date the person who purchased such stock or assets, or a person who controls such person, agrees in writing to assume the liability for the benefits credited to the affected Participants by reason of their participation in the Plan.

Son 10.4 Suspension of Rules.

(a) Federal Securities and Other Laws . Notwithstanding anything in the Plan to the contrary, and to the extent and for the time reasonably necessary to comply with federal securities laws (or other applicable laws or regulations), elective deferrals, Participant investment-direction, and payment dates and forms under the Plan may be suspended, changed, or delayed as necessary to comply with such laws or regulations; provided, however, any payments so delayed shall be paid to the Participant or Beneficiary as of the earliest date the Committee determines that such payment will not cause a violation of any such laws or regulations.

(b) Section 162(m) . If the Committee reasonably determines that a scheduled payment of benefits under the Plan will not be deductible by an Employer by reason of Code section 162(m), it may, if and to the extent permitted by Code section 409A, suspend all such payments to the extent not so deductible. Payments so suspended shall be paid by the fifteenth (15th) day of the third month after the affected Participant dies, becomes Disabled, or incurs a Separation from Service, or if earlier, when such payment is deductible by the Company;

provided, however, if the Participant is a Specified Employee when he or she incurs a Separation from Service, payments suspended pursuant to this subsection shall be paid as described except the six (6) month anniversary of the actual Separation from Service shall be treated as the date the affected Participant Separated from Service.

(c) Offset for Amounts Due . A Participant's vested Account balance may be reduced by one or more offsets to repay any amounts then due and owing to an Employer, unless another means of repayment is agreed to by the Committee. Except for the right to immediate offset for an amount up to $5,000, or such higher amount as allowed under Treasury Regulations or other directives, the Account balance shall not be so offset before it is otherwise scheduled to be paid to the Participant or Beneficiary and the amount then offset shall not exceed the amount that would be otherwise so paid.

Section 10.5 Requirement of Proof. In discharging their duties and responsibilities under the Plan, the Committee or other individual may require proof of any matter concerning this Plan, and no person shall acquire any rights or be entitled to receive any benefits under this Plan until such proof is furnished.

Section 10.6 Indemnification. The Company shall indemnify each member of the Committee and hold each of them harmless from the consequences of acts or conduct when done in their capacity as Committee members. This provision shall apply only if the member acted in good faith and in a manner reasonably believed to be solely in the best interests of the Participants and Beneficiaries and, with respect to any criminal action or proceeding, had no reasonable cause to believe the conduct was unlawful. Such indemnification shall cover any and all reasonable attorneys' fees and expenses, judgments, fines and amounts paid in settlement, but only to the extent such amounts are (i) actually and reasonably incurred, (ii) not otherwise paid or reimbursable under an applicable Employer paid insurance policy, and (iii) not duplicative of other payments made or reimbursements due by the Company or its affiliates under other indemnity agreements.

In no event shall this Section 10.6 be construed to require the Company to indemnify third parties with whom it may contract to perform administrative or investment management duties or to indemnify the Trustee to any extent beyond what may be required under such contract or the Trust agreement, respectively.

Section 10.7. Non-Alienation and Taxes.

(a) General . Except as otherwise expressly provided herein or as otherwise required by law, no right or interest of any Participant or Beneficiary in the Plan and the Trust shall be subject in any manner to anticipation, alienation, sale, transfer, assignment, pledge, encumbrance, charge, attachment, garnishment, execution, levy, bankruptcy, or any other disposition of any kind, either voluntary or involuntary, prior to actual receipt of payment by the person entitled to such right or interest under the provisions hereof, and any such disposition or attempted disposition shall be void.

(b) Tax Withholdings . (1) General . Benefits earned under the Plan and payment of such benefits shall be subject to tax reporting and withholding as required by law

and the amount of such withholding may be determined by treating such benefits as being in the nature of supplemental wages. If tax withholdings must be made before such benefits are paid to a Participant or Beneficiary (e.g., FICA taxes on Before-tax Deposits), they shall be made from other wages paid to such individual apart from the Plan to the extent reasonably possible; provided, however, if such other wages are insufficient for that purpose, the withholdings shall be made from and reduce Before-tax Deposits or Employer Contributions, as applicable, for the individual concerned or, if no such contributions are available, the relevant Employer shall advance the withholdings, the appropriate Account balance of the individual concerned shall be reduced in the same amount, and upon the direction of the Committee the Trustee shall remit to the Employer an amount equal to such reduction.

(2) Tax Consequences . Neither the Company nor any other Employer represents or guarantees that any particular federal, foreign, state or local income, payroll, or other tax consequence will result from participation in this Plan or payment of benefits under the Plan.

(c) Coordination with Code Section 457A . If a Participant is subject to Code Section 457A in a Plan Year, then to the extent required by Code Section 457A:

(1) His or her Before-tax Deposits for such year shall be deducted from the Participant's Base Compensation and/or Bonus Compensation on an after-tax basis, and as a result the Employer Matching and Discretionary Contributions shall be calculated by taking into considered that such deposits are includible in the Participant's compensation for such year;

(2) All allocations made during such Plan Year, including Employer Contributions and earnings credited on deferred amounts, shall be considered taxable income to the extent vested in such year;

(3) All prior deferred amounts shall be considered taxable income in such year to the extent vested (and not previously included in income); provided that with regard to amounts deferred that are attributable to services performed prior to January 1, 2009, such amounts shall not be required to be included in taxable income until December 31, 2017.

Notwithstanding any provision of the Plan to the contrary, the Administrator may authorize the payment of amounts in the year such amounts are included in income under this subsection (c) unless payment at such time would violate Code Section 409A.

Section 10.8. Not Compensation Under Other Benefit Plans. No amounts allocated to a Participant's Account shall be deemed to be salary or compensation for purposes of the RSIP or any other employee benefit plan of the Company or any other Employer except as and to the extent otherwise specifically provided in such other plan.

Section 10.9. Savings Clause. If any term, covenant, or condition of this Plan, or the application thereof to any person or circumstance, shall to any extent be held to be invalid or unenforceable, the remainder of this Plan, or the application of any such term, covenant, or condition to persons or circumstances other than those as to which it has been held to be invalid or unenforceable, shall not be affected thereby, and, except to the extent of any such invalidity or

unenforceability, this Plan and each term, covenant, and condition hereof shall be valid and shall be enforced to the fullest extent permitted by law.

Section 10.10. Facility of Payment. If the Committee shall determine a Participant or Beneficiary entitled to a distribution hereunder is incapable of caring for his or her own affairs because of illness or otherwise, it may direct any distribution from such Participant's Accounts be made, in such shares as it shall determine, to the Spouse, child, parent or other blood relative of such Participant or Beneficiary, or any of them, or to such other person or persons as the Committee may determine, until such date as it shall determine such incapacity no longer exists; provided, however, the exercise of this discretion shall not cause an acceleration or delay in the time of payment of Plan benefits except to the extent, and only for the duration of, the time reasonably necessary to resolve such matters or otherwise protect the interests of the Plan. The Committee shall be under no obligation to see to the proper application of the distributions so made to such person or persons and any such distribution shall be a complete discharge of any liability under the Plan to such Participant or Beneficiary, to the extent of such distribution.

Section 10.11. Requirement of Releases. If in the opinion of the Committee, any present or former Spouse or dependent of a Participant or other person shall by reason of the law of any jurisdiction appear to have any bona fide interest in Plan benefits that may become payable to a Participant or with respect to a deceased Participant, or otherwise has asserted such a claim, the Committee may direct such benefits be withheld pending receipt of such written releases as it deems necessary to prevent or avoid any conflict or multiplicity of claims with respect to the payment of such benefits, but only to the extent and for the duration reasonably necessary to resolve such matters or otherwise protect the interests of the Plan.

Section 10.12. Board Action. Any action which is required or permitted to be taken by the Board of Directors of the Company under the Plan may be taken by the Compensation Committee of such board or any other authorized committee of such board.

Section 10.13. Computational Errors . In the event mathematical, accounting, or similar errors are made in processing or paying a benefit under the Plan, the Committee may make such equitable adjustments as it deems appropriate (which may be retroactive) to correct such errors.

Section 10.14. Unclaimed Benefits. In the event any person who is entitled to benefits hereunder cannot be located despite reasonable and diligent efforts to do so, then such person's benefits shall be automatically forfeited as of the last day of the Plan Year next following the year in which such benefits first became payable; provided, however, in the event such person subsequently makes a valid claim for such forfeited benefits prior to the termination of the Plan, such benefits shall be reinstated and immediately paid.

Section 10.15. Communications. The Committee, or its delegate, or the Trustee, as to the function or authority concerned, shall prescribe such forms of communication, including forms for benefit application and the like, with respect to the Plan and Fund as it deems appropriate. Except as otherwise prescribed by such persons or otherwise provided by governing statute or regulation, any such communication and assent or consent thereto may be handled by electronic means.

ARTICLE XI
TRANSITIONAL RULES

Section 11.1. Introduction. This Plan document is effective on January 1, 2009 (i.e., the "effective date") and, except as otherwise provided herein, shall apply only to those Participants who are eligible to actively participate in the Plan on or after the effective date. For the period that began on January 1, 2005 and ended December 31, 2008, the Plan as in effect on December 31, 2004 governed the rights and obligations of the Company and Participants, except as modified by the Company in its discretion so that the Plan and its operations were in good faith compliance with Code Section 409A.

Section 11.2. Amounts Deferred Under Prior Plan.
Account balances (including earnings and losses on such balances regardless of when incurred) attributable to deposits and contributions for periods before 2005 shall be accounted for separately from account balances attributed to deposits and contributions for periods after 2004 and such pre-2005 deferrals shall be governed by the terms and conditions of the Plan as in effect on December 31, 2004, which are contained in a separate plan document; provided that if any such amounts are includible in income under Code Section 457A, then payment of such amounts shall be subject to the provisions of Section 10.7(c) hereof .

_____

The undersigned, by the authority of the Board of Directors of Pentair, Inc., does hereby approve the form and content of this Plan document.

Dated:

SCHEDULE 1 - BASE COMPENSATION

Items Included	Items Excluded
Base salary before deferrals for: 401(k) plan before-tax employee contributions; Section 125 plan (flexible benefit, cafeteria plan) pre-tax employee contributions; and Section 132(f)(4) plan (transportation benefit plan) pre-tax employee contributions	All other items of compensation

SCHEDULE 2 - BONUS COMPENSATION

- Performance Awards under the Pentair plc 2012 Stock and Incentive Plan that are not Equity Awards
- Management Incentive Plan (“MIP”)
- Local GBU-specific annual bonus plans (Flow participants only), but excluding any Tracer Industries Management, LLC bonus plan

SCHEDULE 3

COMMITTEE MEMBERS

1. Senior Vice President of Human Resources
2. Vice President of Compensation and Benefits
3. Vice President of Treasury and Tax

Exhibit 10.32

PENTAIR 2012 STOCK AND INCENTIVE PLAN

PERFORMANCE STOCK UNIT AWARD AGREEMENT

Pursuant to the notice of grant (the "Grant Notice") and this Performance Stock Unit Award Agreement, including any country-specific terms in the applicable addendum hereto (the "Addendum") (together, this "Award Agreement"), Pentair plc (the "Company") has granted to you Performance Stock Units ("PSUs") with respect to the number of ordinary shares of the Company ("Shares") specified in the Grant Notice. Capitalized terms not defined in this Award Agreement but defined in the Pentair plc 2012 Stock and Incentive Plan, as may be amended or restated from time to time (the "Plan") shall have the same definitions as in the Plan. Unless you decline this Award Agreement within 90 days, you agree to be bound by all of the provisions contained in this Award Agreement and the Plan.

1. Vesting . Except as otherwise provided in the Plan or this Award Agreement, the PSUs will vest as provided in the Grant Notice.

2. Settlement of PSUs . The Company shall deliver to you a whole number of Shares equal to the number of PSUs (if any) that vest pursuant to this Award Agreement, subject to withholding of any Tax-Related Items (as defined in Section 6 below). Such delivery shall take place (i) as soon as practicable following the date the Committee certifies the achievement of the performance goal(s) described in the Grant Notice (or other communication to you), if applicable, but in no event more than 75 days after the end of the performance period, or (ii) within 30 days after the vesting date if such certification is not necessary.

Notwithstanding the foregoing, if you are resident or provide services outside of the United States, the Company, in its sole discretion, may provide for the settlement of the PSUs in the form of:

(a) a cash payment in an amount equal to the Fair Market Value of the Shares as of the vesting date that correspond to the number of vested PSUs, to the extent that settlement in Shares (i) is prohibited under local law, (ii) would require you, the Company or any of its Affiliates to obtain the approval of any governmental or regulatory body in your country of residence (or country of employment, if different), (iii) would result in adverse tax consequences for you, the Company or any of its Affiliates or (iv) is administratively burdensome; or

(b) Shares, but require you to sell such Shares immediately or within a specified period following your termination of service (in which case, you hereby agree that the Company shall have the authority to issue sale instructions in relation to such Shares on your behalf).

3. No Fractional Shares . Only whole Shares will be issuable pursuant to the PSUs; any fractional Share otherwise issuable under the PSUs will be rounded up to the nearst whole Share.

4. Effect of Termination of Service . Unless otherwise provided in the Grant Notice or the Plan, in the event of termination of your service with the Company or any of its Affiliates for any reason (whether voluntarily or involuntarily), all your unvested PSUs will be cancelled

and forfeited. Exceptions are made for termination of service due to death, Retirement, Disability or a Covered Termination in accordance with the terms of the Plan.

For purposes of the PSUs, your service will be considered terminated as of the date you cease active service with the Company or any of its Affiliates (regardless of the reason for such termination and whether or not later found to be invalid or in breach of employment laws in the jurisdiction where you provide services or the terms of your employment or service agreement, if any), and unless otherwise expressly provided in this Award Agreement or determined by the Company in its sole discretion, your right to vest in the PSUs under the Plan, if any, will terminate as of such date and will not be extended by any notice period (e.g., your period of service would not include any contractual notice period or any period of "garden leave" or similar period mandated under employment laws in the jurisdiction where you provide services or the terms of your employment or service agreement, if any). The Company shall have the exclusive discretion to determine when you have ceased active service for purposes of your PSU grant (including whether you may still be considered to be providing services while on a leave of absence).

5. Dividend Equivalent Units . With respect to record dates occurring from and after the Date of Grant until the date that the PSUs are settled, you will be entitled to a cash payment equal to any cash dividend or cash distribution that would have been paid on the PSUs had the PSUs been issued and outstanding Shares on the record date for such dividend or distribution. Dividend Equivalent Units are not eligible for dividend reinvestment during the vesting period.

(a) If you are a United States taxpayer, payment of the Dividend Equivalent Units will be made to you in cash as soon as practicable after the dividend payment date set forth by the Company's Board of Directors.

(b) If you are not a United States taxpayer, Dividend Equivalent Units will accrue on your unvested PSUs over the vesting period, and you will be paid in cash at the same time the related PSUs vest. If you forfeit your unvested PSUs, then the related accrued Dividend Equivalent Units will also be forfeited.

6. Tax Withholding . You acknowledge that, regardless of any action taken by the Company or, if different, the Affiliate that employs you (the "Employer"), the ultimate liability for all income tax, social insurance, payroll tax, fringe benefits tax, payment on account or other tax-related items related to your participation in the Plan and legally applicable to you or deemed by the Company or the Employer in their discretion to be an appropriate charge to you even if legally applicable to the Company or the Employer ("Tax-Related Items"), is and remains your responsibility and may exceed the amount actually withheld by the Company or the Employer, if any. You further acknowledge that the Company and/or the Employer (a) make no representations or undertakings regarding the treatment of any Tax-Related Items in connection with any aspect of the PSUs, including, but not limited to, the grant, vesting or settlement of the PSUs, the subsequent sale of Shares acquired pursuant to such settlement and the receipt of any dividends or dividend equivalents; and (b) do not commit to and are under no obligation to structure the terms of the grant or any aspect of the PSUs to reduce or eliminate your liability for Tax-Related Items or achieve any particular tax result. Further, if you are subject to Tax-Related Items in more than one jurisdiction between the date of grant and the date of any relevant taxable or tax withholding event, as applicable, you acknowledge that the Company and/or the Employer

(or former employer, as applicable) may be required to withhold or account for Tax-Related Items in more than one jurisdiction.

Prior to the relevant taxable or tax withholding event, as applicable, you agree to make adequate arrangements satisfactory to the Company and/or the Employer to satisfy all Tax-Related Items. In this regard, you authorize the Company and/or the Employer, or their respective agents, at their discretion, to satisfy the obligations with regard to all Tax-Related Items by one or a combination of the following: (i) withholding from your wages or other cash compensation paid to you by the Company and/or the Employer; (ii) withholding from the proceeds of the sale of Shares acquired upon vesting of the PSUs either through a voluntary sale or through a mandatory sale arranged by the Company (on your behalf pursuant to this authorization without further consent); (iii) withholding from the Shares to be delivered upon settlement of the PSUs that number of Shares having a Fair Market Value equal to the amount required by law to be withheld; or (iv) permitting you to tender back to the Company a number of Shares delivered upon settlement of the PSUs or Shares previously owned by you having a Fair Market Value equal to the amount required by law to be withheld. For purposes of the foregoing, no fractional Share will be withheld or issued pursuant to the grant of the PSUs and the issuance of Shares hereunder. Notwithstanding the foregoing, if you are a Section 16 Participant, your withholding obligations shall be satisfied as described in clause (iii) above, unless the Committee approves another form of payment for such Tax-Related Items.

Depending on the withholding method, the Company may withhold or account for Tax-Related Items by considering applicable statutory withholding rates (as determined by the Company in good faith and in its sold discretion) or other applicable withholding rates, including maximum applicable rates, in which case you will receive a refund of any over-withheld amount from the relevant taxing authority in cash and will have no entitlement to the share equivalent. If the obligation for Tax-Related Items is satisfied by withholding from the Shares to be delivered upon vesting of the PSUs, for tax purposes, you are deemed to have been issued the full number of Shares subject to the vested PSUs, notwithstanding that a number of Shares are held back solely for the purpose of paying the Tax-Related Items.

You agree to pay to the Company or the Employer any amount of Tax-Related Items that the Company or the Employer may be required to withhold or account for as a result of your participation in the Plan that cannot be satisfied by the means previously described. The Company may refuse to issue or deliver Shares or proceeds from the sale of Shares until arrangements satisfactory to the Administrator have been made in connection with the Tax-Related Items. You will have no further rights with respect to any Shares that are retained by the Company pursuant to this provision.

7. Recoupment . The PSUs (and any compensation paid or Shares issued under the PSUs) are subject to recoupment in accordance with the Dodd-Frank Wall Street Reform and Consumer Protection Act and any implementing regulations thereunder, any clawback policy adopted by the Company and any compensation recovery policy or practice otherwise required by applicable law. The Company shall have the right to offset against any other amounts due from the Company to you the amount owed by you hereunder.

8. Confidentiality, Non-Competition, Non-Solicitation and Non-Disparagement . As a condition to the receipt of the PSUs, you expressly agree to the terms and conditions in the Confidentiality, Non-Competition, Non-Solicitation and Non-Disparagement Agreement

attached hereto as Exhibit A. In addition to any remedies available to the Company under Section 5 of Exhibit A, any violation of the terms and conditions of Exhibit A will result in a rescission of the PSUs made under this Award Agreement and a forfeiture of rights you have with respect thereto.

9. Securities Law Compliance . The grant of the PSUs and the issuance of Shares are subject to all applicable laws, rules and regulations and to such approvals by any governmental agencies or securities exchange as may be required. Notwithstanding any provision of this Award Agreement or the Plan, the Company has no liability to deliver any Shares under the Plan or make any payment unless such delivery or payment would comply with all laws and the applicable requirements of any governmental agency, securities exchange or similar entity, and unless and until you have taken all actions required by the Company in connection with the PSUs. The Company may impose such restrictions on any Shares issued under the Plan as the Company determines necessary or desirable to comply with all applicable laws, rules and regulations or requirements.

10. Transferability . The PSUs shall not be transferable in any manner (including without limitation, sale, alienation, anticipation, pledge, encumbrance, or assignment) other than transfer by will or by the laws of descent and distribution, unless otherwise determined by the Committee in accordance with the terms of the Plan. All rights with respect to the PSUs shall be exercisable during your lifetime only by you or your guardian or legal representative or permitted transferee.

11. Shareholder Rights . You shall not have any voting rights or any other rights and privileges of a shareholder of the Company unless and until Shares (if any) are issued upon settlement of the PSUs. Prior to actual payment of any PSUs, such PSUs will represent an unsecured obligation of the Company, payable (if at all) only from the general assets of the Company.

12. Insider Trading and/or Market Abuse . By participating in the Plan, you agree to comply with the Company's policy on insider trading (to the extent that it is applicable to you). You further acknowledge that, depending on your or your broker's country of residence or where the Shares are listed, you may be subject to insider trading restrictions and/or market abuse laws which may affect your ability to accept, acquire, sell or otherwise dispose of Shares, rights to Shares (e.g., PSUs) or rights linked to the value of Shares, during such times you are considered to have "inside information" regarding the Company as defined by the laws or regulations in your country. Local insider trading laws and regulations may prohibit the cancellation or amendment of orders you place before you possessed inside information. Furthermore, you could be prohibited from (i) disclosing the inside information to any third party (other than on a "need to know" basis) and (ii) "tipping" third parties or causing them otherwise to buy or sell securities. You understand that third parties include fellow employees. Any restriction under these laws or regulations are separate from and in addition to any restrictions that may be imposed under any applicable Company insider trading policy. You acknowledge that it is your responsibility to comply with any applicable restrictions, and that you should therefore consult your personal advisor on this matter.

13. Code Section 409A . For U.S. taxpayers, it is the intent that the PSUs as set forth in this Award Agreement shall qualify for exemption from or comply with the requirements of Section 409A of the Code, and any ambiguities herein will be interpreted to so qualify or

comply. Notwithstanding the foregoing, if it is determined that the PSUs fail to satisfy the requirements of the short-term deferral period exemption and are otherwise deferred compensation subject to Section 409A of the Code, and if you are a "specified employee" as of the date of your "separation from service" (as those terms are defined in the Plan or Section 409A of the Code), then the issuance of any Shares that would otherwise be made upon the date of your separation from service or within the first six (6) months thereafter will not be made on the originally scheduled date and will instead be issued in a lump sum on the date that is six (6) months and one day after the date of your separation from service, but only if such delay in the issuance of the Shares is necessary to avoid the imposition of additional taxation on you in respect of the Shares under Section 409A of the Code. The Company reserves the right, to the extent the Company deems necessary or advisable in its sole discretion, to unilaterally amend or modify this Award Agreement as may be necessary to ensure that all payments provided for under this Award Agreement are made in a manner that qualifies for exemption from or complies with Section 409A of the Code; provided, however, that the Company makes no representation that the grant, vesting, or settlement of PSUs provided for under this Award Agreement will be exempt from or comply with Section 409A of the Code and makes no undertaking to preclude Section 409A of the Code from applying to the grant, vesting or settlement of PSUs provided for under this Award Agreement. The Company will have no liability to you or any other party if the PSUs, the delivery of Shares upon settlement of the PSUs or other payment hereunder that is intended to be exempt from, or compliant with, Section 409A of the Code, is not so exempt or compliant or for any action taken by the Company with respect thereto.

14. Electronic Delivery and Acceptance. The Company may, in its sole discretion, decide to deliver any documents related to current or future participation in the Plan by electronic means. You hereby consent to receive such documents by electronic delivery and agree to participate in the Plan through an online or electronic system established and maintained by the Company or a third party designated by the Company. You also agree that all online acknowledgements shall have the same force and effect as a written signature.

15. Nature of Grant. In accepting the PSUs, you acknowledge and agree that:

(a) the Plan is established voluntarily by the Company, it is discretionary in nature and it may be modified, amended, suspended or terminated by the Company, in its sole discretion, at any time (subject to any limitations set forth in the Plan);

(b) the grant of PSUs is voluntary and occasional and does not create any contractual or other right to receive future grants of PSUs, or benefits in lieu of PSUs, even if PSUs or other awards have been granted in the past;

(c) all decisions with respect to future awards, if any, will be at the sole discretion of the Company;

(d) your participation in the Plan is voluntary;

(e) the PSUs and your participation in the Plan shall not create a right to employment or be interpreted as forming an employment or service contract with the Company or any of its Affiliates and shall not interfere with the ability of the Company, any of its Affiliates or the Employer, as applicable, to terminate your employment or service relationship (as otherwise may be permitted under local law);

(f) the PSUs and the Shares, and the income and value of the same, subject to the PSUs are not intended to replace any pension rights or compensation;

(g) the PSUs and any Shares acquired under the Plan and the income and value of same, are not part of normal or expected compensation for purposes of calculating any severance, resignation, termination, redundancy, dismissal, end-of-service payments, bonuses, long-service awards, pension or retirement or welfare benefits or similar payments and in no event should be considered as compensation for, or relating in any way to, past services for the Company, the Employer or any Affiliate;

(h) the future value of the underlying Shares is unknown, indeterminable, and cannot be predicted with certainty;

(i) no claim or entitlement to compensation or damages shall arise from forfeiture of the PSUs resulting from termination of your service (for any reason whatsoever and whether or not in breach of local labor laws or later found invalid), and in consideration of the grant of the PSUs to which you are otherwise not entitled, you irrevocably agree never to institute any claim against the Company, any of its Affiliates, or the Employer, waive your ability, if any, to bring any such claim, and release the Company, its Affiliates and the Employer, from any such claim;

(j) the PSUs and the benefits evidenced by this Award Agreement do not create any entitlement not otherwise specifically provided for in the Plan or provided by the Company in its discretion, to have the PSUs or any such benefits transferred to, or assumed by, another company, nor to be exchanged, cashed out or substituted for, in connection with any corporate transaction affecting the Shares; and

(k) if you are employed or providing services outside of the United States, neither the Company nor any of its Affiliates shall be liable for any foreign exchange rate fluctuation between your local currency and the U.S. dollar that may affect the value of the PSUs or any amounts due to you pursuant to the settlement of the PSUs or the subsequent sale of any Shares acquired upon settlement of the PSUs.

16. *Data Privacy . You hereby explicitly and unambiguously consent to the collection, use and transfer, in electronic or other form, of your personal data as described in this Award Agreement, the Grant Notice and any other PSU grant materials by and among, as necessary and applicable, the Company or any of its Affiliates, for the exclusive purpose of implementing, administering and managing your participation in the Plan. If there is a conflict between this Section 16 and the Company's existing policies and/or data protection charters, the terms of this Section 16 will prevail with respect to issues related to the PSUs and the Plan.*

You understand that the Company and/or the Employer may hold certain personal information about you, including, but not limited to, your name, home address, email address and telephone number, date of birth, social security or insurance number, passport number or other identification number, salary, nationality, and any Shares or directorships held in the Company, and details of the PSUs or any other entitlement to Shares, canceled, exercised, vested, unvested or outstanding in your favor ("Data"), for the purpose of implementing, administering and managing the Plan.

You understand that Data will be transferred to Fidelity Stock Plan Services or such other stock plan service provider as may be selected by the Company in the future, which is assisting the Company with the implementation, administration and management of the Plan. You understand that the recipients of Data may be located in the United States or elsewhere, and that the recipients' country (e.g. *, the United States) may have different data privacy laws and protections than your country. If you are employed outside the United States, you understand that you may request a list with the names and addresses of any potential recipients of Data by contacting your local human resources representative. You authorize the Company, Fidelity Stock Plan Services and any other possible recipients that may assist the Company (presently or in the future) with implementing, administering and managing the Plan to receive, possess, use, retain and transfer Data, in electronic or other form, for the sole purpose of implementing, administering and managing your participation in the Plan. You understand that Data will be held only as long as is necessary to implement, administer and manage your participation in the Plan. If you are employed outside the United States, you understand that you may, at any time, view Data, request additional information about the storage and processing of Data, require any necessary amendments to Data or refuse or withdraw the consents herein, in any case without cost, by contacting in writing your local human resources representative. Further, you understand that you are providing the consents herein on a purely voluntary basis. If you do not consent, or if you later seek to revoke your consent, your service status and career will not be affected; the only consequence of refusing or withdrawing your consent is that the Company would not be able to grant you PSUs or other equity awards or administer or maintain such awards. Therefore, you understand that refusing or withdrawing your consent may affect your ability to participate in the Plan.*

For more information on the consequences of your refusal to consent or withdrawal of consent, you understand that you may contact your local human resources representative.

Finally, upon request of the Company or the Employer, you agree to provide an executed data privacy consent form to the Company and/or the Employer (or any other agreements or consents that may be required by the Company and/or the Employer) that the Company and/or the Employer may deem necessary to obtain from you for the purpose of administering your participation in the Plan in compliance with the data privacy laws in your country, either now or in the future. You understand and agree that you will not be able to participate in the Plan if you fail to provide any such consent or agreement requested by the Company and/or the Employer.

17. Not a Public Offering . If you are a resident outside of the United States, the grant of the PSUs is not intended to be a public offering of securities in your country of residence (or country of service, if different). The Company has not submitted any registration statement, prospectus or other filings with the local securities authorities (unless otherwise required under local law), and the grant of the PSUs is not subject to the supervision of the local securities authorities.

18. Language . If you are resident in a country where English is not an official language, you acknowledge and agree that it is your express intent that this Award Agreement and the Plan and all other documents, notices and legal proceedings entered into, given or instituted pursuant to the PSUs be drawn up in English. If you have received this Award Agreement or any other document related to the Plan translated into a language other than English and if the meaning of the translated version is different than the English version, the English version will control.

19. No Advice Regarding Grant . The Company is not providing any tax, legal or financial advice, nor is the Company making any recommendations regarding your participation in the Plan, or your acquisition or sale of the underlying Shares. You are hereby advised to consult with your own personal tax, legal and financial advisors regarding your participation in the Plan before taking any action related to the Plan.

20. Repatriation; Compliance with Law . If you are resident or provide services outside the United States, you agree to repatriate all payments attributable to Shares and/or cash acquired under the Plan in accordance with applicable foreign exchange rules and regulations in your country of residence (and country of service, if different). In addition, you agree to take any and all actions, and consent to any and all actions taken by the Company and its Affiliates, as may be required to allow the Company and its Affiliates to comply with local laws, rules and/or regulations in your country of residence (and country of service, if different). Finally, you agree to take any and all actions as may be required to comply with your personal obligations under local laws, rules and/or regulations in your country of residence and country of service, if different).

21. Addendum . Notwithstanding any provisions in this Award Agreement, the PSUs shall be subject to any special terms and conditions set forth in the Addendum to this Award Agreement, as set forth in Exhibit B. Moreover, if you transfer to one of the countries included in such Addendum, the special terms and conditions for such country will apply to you, to the extent the Company determines that the application of such terms and conditions is necessary or advisable to comply with local law or facilitate the administration of the Plan (or the Company may establish alternative terms and conditions as may be necessary or advisable to accommodate your transfer). The Addendum constitutes part of this Award Agreement.

22. Imposition of Other Requirements . The Company reserves the right to impose other requirements on your participation in the Plan, on the PSUs, and on any Shares acquired under the Plan, to the extent the Company determines it is necessary or advisable in order to comply with local law or facilitate the administration of the Plan, and to require you to sign any additional agreements or undertakings that may be necessary to accomplish the foregoing.

23. Notices . Any notices provided for in the Grant Notice, this Award Agreement or the Plan shall be given in writing (including electronically) and shall be deemed effectively given upon receipt or, in the case of notices delivered via post by the Company to you, five (5) days after deposit in the mail, postage prepaid, addressed to you at the last address you provided to the Company.

24. Governing Plan Document . The PSUs are subject to the Grant Notice, this Award Agreement and all the provisions of the Plan, the provisions of which are hereby made a part of this Award Agreement, and is further subject to all interpretations, amendments, rules and regulations which may from time to time be promulgated and adopted pursuant to the Plan. In the event of any conflict between the provisions of the Grant Notice, this Award Agreement and those of the Plan, the provisions of the Plan shall control. By accepting the PSUs, you confirm that you have read and understood the Award Agreement, the Plan, the Plan prospectus and related information provided to you and that you accept the terms of those documents accordingly.

25. Administrator Authority. You expressly understand that the Administrator is authorized to administer, construe, and make all determinations necessary or appropriate for the administration of the Award Agreement and the Plan, and that any interpretation or determination made by the Administrator under the Award Agreement or the Plan, will be final, binding and conclusive.

26. Governing Law and Venue. The PSUs and the provisions of this Award Agreement are governed by, and subject to, the laws of the state of Minnesota, U.S.A. without regard to the conflict of law provisions. For purposes of any action, lawsuit or other proceedings brought to enforce this Award Agreement, relating to it, or arising from it, the parties hereby submit to and consent to the sole and exclusive jurisdiction of the United States District Court for the District of Minnesota or any of the courts of the state of Minnesota, U.S.A..

27. Severability. If any provision of this Award Agreement is held to be unenforceable for any reason, it shall be adjusted rather than voided, if possible, in order to achieve the intent of the parties to the extent possible. In any event, all other provisions of this Award Agreement shall be deemed valid and enforceable to the full extent possible.

28. Waiver. The waiver by the Company with respect to your (or any other Participant's) compliance of any provision of this Award Agreement shall not operate or be construed as a waiver of any other provision of this Award Agreement, or of any subsequent breach by such party of a provision of this Award Agreement.

* * * *

EXHIBIT A

PENTAIR PLC CONFIDENTIALITY, NON-COMPETITION, NON-SOLICITATION AND NON-DISPARAGEMENT AGREEMENT

As a result of your intimate familiarity with proprietary and confidential information of the Company, the Award Agreement is subject to the restrictions set forth below. Any violation of these provisions will result in a rescission of the PSUs made under the Award Agreement and a forfeiture of any rights you have with respect thereto, as well as the remedies that are described in Section 5 hereof.

1. Confidentiality . You agree that you will treat during employment and thereafter, as private and privileged, any information, data, figures, projections, estimates, marketing plans, customer lists, lists of contract workers, tax records, personnel records, accounting procedures, formulas, contracts, business partners, alliances, ventures and all other confidential information you acquire while working for the Company or any of its Affiliates. You agree that you will not release any such information to any person, firm, corporation or other entity at any time, except as may be required by law, or as agreed to in writing by the Company. You acknowledge that any violation of this non-disclosure provision shall entitle the Company to appropriate injunctive relief and to any damages which it may sustain due to the improper disclosure. However, you shall not be held in breach of this provision if you disclose confidential information to a federal, state or local government official, either directly or indirectly, or to an attorney, solely for the purpose of reporting or investigating a suspected violation of law.

2. Non-Solicitation . You agree that, for a 12 month period (24 month period, if you are a Section 16 Participant at the time of your termination of employment) following your termination (voluntary or involuntary) from the Company or any of its Affiliates, you will not, for yourself or any third party, directly or indirectly, (i) solicit or accept competitive business from any customer of the Company or its Affiliates, or (ii) solicit any employee of the Company or its Affiliates for the purpose of hiring such person or otherwise entice, induce or encourage, directly or indirectly, any such employee to leave their employment.

You agree that engaging in any of the following activities will be a violation of the above paragraph: (1) soliciting for a hire or soliciting for retainer as an independent consultant or as contingent worker any employee of the Company or its Affiliates; (2) participating in the recruitment of any employee of the Company or its Affiliates; (3) serving as a reference for an employee of the Company or its Affiliates; (4) offering an opinion regarding the candidacy as a potential employee, independent consultant or contingent worker of an individual employed by the Company or its Affiliates; (5) assisting or encouraging any third party to pursue an employee of the Company or its Affiliates for potential employment, independent consulting or contingent worker opportunities; or (6) assisting or encouraging any employee of the Company or its Affiliates to leave their current position in order to be an employee, independent consultant or contingent worker for a third party.

a. Non-Competition . You agree that, for a 12 month period (24 month period, if you are a Section 16 Participant at the time of your termination of employment) following your termination (voluntary or involuntary) from the Company or its Affiliates, you will not, for yourself or for any third party, directly or indirectly, in whole or in part, provide services, whether as an employee, employer, owner, operator, manager, advisor, consultant, agent, partner,

director, stockholder, officer, volunteer, intern, or any other similar capacity, to any entity anywhere in the world engaged in a business that is competitive with the Company or its Affiliates. Notwithstanding the prior sentence, you are not prohibited from providing services to a competing entity if: (i) the duties and services provided by you to the competitor are not, in whole or in part, substantially similar to the duties and services you provided to the Company or its Affiliates; and (ii) the duties and services provided by you to the competitor are not reasonably likely to cause you to reveal trade secrets, know-how, customer lists, customer contracts, customer needs, business strategies, marketing strategies, product development, proprietary information and confidential information concerning the business of the Company or its Affiliates. Nothing in this Award Agreement prohibits you from purchasing or owning less than five percent (5%) of the publicly traded securities of any corporation, provided that your ownership represents a passive investment and that you are not a controlling person of, or a member of a group that controls, the corporation.

b. Non-Disparagement . You agree that you will not make disparaging remarks of any sort or otherwise communicate any disparaging comments to any other person or entity, about the Company and any of its divisions, subsidiaries, predecessors and successors, and any affiliated entities and persons, and all of their respective past and present employees, agents, insurers, officials, officers and directors. However, you shall not be held in breach of this provision if you disclose confidential information to a federal, state or local government official, either directly or indirectly, or to an attorney, solely for the purpose of reporting or investigating a suspected violation of law.

c. Effect of Breach . By accepting the PSUs, you agree that in light of the award conferred to you under this Award Agreement, the narrow and restrictive covenants imposed above are reasonable and will not result in any hardship to you. Further, you acknowledge and agree that a breach of any obligation under this Award Agreement will result in irreparable injury to the Company and that such harm may not be compensable entirely with monetary damages. The Company reserves all rights to seek any and all remedies and damages permitted under law, including, but not limited to, injunctive relief, equitable relief and compensatory damages. In connection with any suit at law or in equity under this Award Agreement, the Company shall be entitled to an accounting, and to the repayment of all profits, compensation, commissions, fees, or other remuneration which you or any other entity or person has either directly or indirectly realized on its behalf or on behalf of another and/or may realize, as a result of, growing out of, or in connection with the violation which is the subject of the suit. Further, in the event of your breach of the above sections, you shall disgorge the value of all payments and benefits conferred to you by virtue of this Award Agreement, including, but not limited to, the cash or Shares awarded. In addition to the foregoing, the Company shall be entitled to collect from you any reasonable attorney's fees and costs occurred in brining any action against you or otherwise to enforce the terms of this Award Agreement.

EXHIBIT B

[ADDENDUM TO RESTRICTED STOCK UNIT AWARD AGREEMENT]

[COUNTRY-SPECIFIC TERMS AND CONDITIONS]

Exhibit 21

Pentair plc and subsidiaries as of December 31, 2018

Name of Company	Jurisdiction of Incorporation
Aplex Industries, Inc.	United States
Century Mfg. Co.	United States
Chansuba Pumps Private Limited [1]	India
Edward Barber & Company Limited	United Kingdom
Edward Barber (U.K.) Limited	United Kingdom
Epps, Ltd.	Mauritius
ETE Coliban Pty Limited	Australia
Everpure Japan Kabushiki Kaisha	Japan
FARADYNE Motors (Suzhou) Co., Ltd [2]	China
Faradyne Motors LLC [2]	United States
FilterSoft, LLC	United States
Fleck Controls, Inc.	United States
Goyen Controls Co. Pty. Limited	Australia
Goyen Valve LLC	United States
Great American Aquaculture, LLC	United States
Greenspan Environmental Technology Pty Ltd	Australia
Haffmans B.V.	Netherlands
Haffmans North America, Inc.	United States
Hawley Group Canada Limited	Canada
Holding Nijhuis Pompen B.V.	Netherlands
Hypro EU Limited	United Kingdom
Infinite Water Solutions Private Limited [2]	India
Jung Pumpen GmbH	Germany
Lincoln Automotive Company	United States
McNeil (Ohio) Corporation	United States
MECAIR S.r.L.	Italy
Milperra Developments Pty Limited	Australia
Moraine Properties, LLC	United States
Nano Terra, Inc. [3]	United States
Nijhuis International B.V.	Netherlands
Nijhuis Pompen B.V.	Netherlands
Nijhuis Pompen BVBA	Belgium
Nijhuis Pompen Exploitatiemaatschappij B.V.	Netherlands
Panthro Acquisition Co.	United States
Pentair (NZ) Limited	New Zealand
Pentair Aquatic Eco-Systems (Canada), Inc.	Canada
Pentair Aquatic Eco-Systems, Inc.	United States
Pentair Australia Holdings Pty Limited	Australia
Pentair Beteiligungs GmbH	Germany
Pentair Canada, Inc.	Canada
Pentair Chile SpA	Chile
Pentair Clean Process Technologies India Private Limited	India
Pentair Denmark Holding ApS	Denmark
Pentair Environmental Systems Limited	United Kingdom
Pentair Epsilon Limited	Bermuda
Pentair Federal Pump, LLC	United States
Pentair Filtration Solutions, LLC	United States
Pentair Finance Group GmbH	Switzerland
Pentair Finance Holding GmbH	Switzerland

Pentair Finance S.a.r.l.	Luxembourg
Pentair Flow Control International Pty Limited	Australia
Pentair Flow FZE	United Arab Emirates
Pentair Flow Services AG	Switzerland
Pentair Flow Technologies de Mexico, S. de R.L. de C.V.	Mexico
Pentair Flow Technologies Pacific Pty Ltd	Australia
Pentair Flow Technologies, LLC	United States
Pentair France SARL	France
Pentair Germany GmbH	Germany
Pentair Global Holdings B.V.	Netherlands
Pentair Global S.a.r.l.	Luxembourg
Pentair Group (Thailand) Limited [4]	Thailand
Pentair Holdings S.a.r.l.	Luxembourg
Pentair Holdings, Inc.	United States
Pentair Housing, Inc.	United States
Pentair Housing, LP	United States
Pentair Iceland Holdings ehf	Iceland
Pentair International (UK) Ltd	United Kingdom
Pentair International Holding S.a.r.l.	Luxembourg
Pentair International Sarl	Switzerland
Pentair Investments Switzerland GmbH	Switzerland
Pentair Ireland Limited	Ireland
Pentair Janus Holding LLC	United States
Pentair Janus Holdings	Bermuda
Pentair Kenya Limited	Kenya
Pentair Luxembourg S.a.r.l.	Luxembourg
Pentair Management Company	United States
Pentair Manufacturing Belgium BVBA	Belgium
Pentair Manufacturing France S.A.S.	France
Pentair Manufacturing Italy S.r.L.	Italy
Pentair Middle East FZE	United Arab Emirates
Pentair Nanosoft US Holdings, LLC	United States
Pentair Netherlands Finance B.V.	Netherlands
Pentair Netherlands Holding B.V.	Netherlands
Pentair Pacific Rim (Water) Limited	Hong Kong
Pentair Pacific Rim, Limited	Hong Kong
Pentair Philippines, Inc. [4]	Philippines
Pentair Residential Filtration, LLC	United States
Pentair Services France S.A.S.	France
Pentair Shenzhen Enclosure Company, Ltd.	China
Pentair Sudmo GmbH	Germany
Pentair Tamimi LLC [5]	Saudi Arabia
Pentair Technical Services L.L.C. [6]	United Arab Emirates
Pentair Trading (Shanghai) Co., Ltd.	China
Pentair Transport, Inc.	United States
Pentair Tubing Limited	United Kingdom
Pentair UK Group Limited	United Kingdom
Pentair UK Holdings Limited	United Kingdom
Pentair Valves & Controls del Uruguay S.A.	Uruguay
Pentair Water (Suzhou) Company, Ltd.	China
Pentair Water Asia Pacific Pte. Ltd.	Singapore
Pentair Water Australia Pty Ltd	Australia
Pentair Water Belgium BVBA	Belgium

Pentair Water Brazil LLC	United States

Pentair Water do Brasil Ltda.	Brazil
Pentair Water France SAS	France
Pentair Water Group, Inc.	United States
Pentair Water Holdings, LLC	United States
Pentair Water India Private Limited	India
Pentair Water Italy S.r.l.	Italy
Pentair Water Latinamerica S.A.	Argentina
Pentair Water Operations Australia Pty Ltd	Australia
Pentair Water Polska Sp.zoo	Poland
Pentair Water Pool and Spa, Inc.	United States
Pentair Water Proces Technologie Holding B.V.	Netherlands
Pentair Water Process Technology B.V.	Netherlands
Pentair Water Purification Systems (Shanghai) Co., Ltd.	China
Pentair Water Spain, S.L.	Spain
Pentair Water Treatment (OH) Company	United States
Pentair Water Treatment Company	United States
Pentair Water Treatment Private Limited [7]	India
Pentair Water, LLC	United States
Pentair Water-Mexico, S. de R.L. de C.V.	Mexico
Pentair, Inc.	United States
Penwald Insurance Company	United States
Peocon ehf.	Iceland
PES Pty Ltd	Australia
PFAM, Inc.	United States
Plymouth Products, Inc.	United States
PTG Accessories Corp.	United States
Seneca Enterprises Co.	United States
Sta-Rite de Mexico, S.A. de C.V.	Mexico
Sta-Rite de Puerto Rico, Inc.	Puerto Rico
Sta-Rite Industries, LLC	United States
Sudmo (UK) Ltd.	United Kingdom
Surface Logix LLC [8]	United States
Tupelo Real Estate, LLC	United States
Union Engineering (NingBo) Co., Ltd.	China
Union Engineering A/S	Denmark
Union Engineering Holding II A/S	Denmark
Union Engineering Holding LLC	United States
Union Engineering Latam Ltda [9]	Brazil
Union Engineering North America LLC	United States
Urban Organics Pentair Group, LLC	United States
Urban Organics Schmidt Real Estate Group, LLC	United States
Urban Organics St. Paul, LLC	United States
Vaki A/S	Norway
Vaki Aquaculture Systems ehf.	Iceland
Vaki Chile Ltda	Chile
Vaki Scotland Ltd	United Kingdom
Voltea Ltd. [10]	United Kingdom
Webster Electric Company, LLC	United States
Wicor Industries (Australia) Pty. Ltd.	Australia
X-Flow B.V.	Netherlands

(1) 47% owned

(2) 50% owned

(3) 4.81% owned

(4) 99.99% owned

(5) 70% owned

(6) 49% owned

(7) 74% owned

(8) 0.03% owned

(9) 99% owned

(10) 1.69% owned

Exhibit 23

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statement Nos. 333-184150, 333-184151 and 333-184152 on Form S-8 and Registration Statement No. 333-209769 on Form S-3 of our reports dated February 19, 2019 , relating to the consolidated financial statements and consolidated financial statement schedule of Pentair plc and subsidiaries, and the effectiveness of Pentair plc and subsidiaries' internal control over financial reporting, appearing in this Annual Report on Form 10-K of Pentair plc and subsidiaries for the year ended December 31, 2018 .

/s/ Deloitte & Touche LLP

Minneapolis, Minnesota
February 19, 2019

Exhibit 24

Power of Attorney

KNOW ALL MEN BY THESE PRESENTS that the undersigned directors of Pentair plc, an entity organized under the laws of Ireland, hereby constitute and appoint John L. Stauch and Karla C. Robertson, or either of them, his/her attorney-in-fact and agent, with full power of substitution, for the purpose of signing on his/her behalf as a director of Pentair plc the Annual Report on Form 10-K, to be filed with the Securities and Exchange Commission within the next sixty days, and to file the same, with all exhibits thereto and other supporting documents, with the Commission, granting unto such attorney-in-fact, full power and authority to do and perform any and all acts necessary or incidental to the performance and execution of the powers herein expressly granted.

Date: February 19, 2019

Signature	**Title**
/s/ Glynis A. Bryan Glynis A. Bryan	Director
/s/ Jacques Esculier Jacques Esculier	Director
/s/ T. Michael Glenn T. Michael Glenn	Director
/s/ Theodore L. Harris Theodore L. Harris	Director
/s/ David A. Jones David A. Jones	Director
/s/ Michael T. Speetzen Michael T. Speetzen	Director
/s/ Billie I. Williamson Billie I. Williamson	Director

Exhibit 31.1

Certification

I, John L. Stauch , certify that:

1. I have reviewed this report on Form 10-K of Pentair plc;

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

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

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 19, 2019

/s/ John L. Stauch

John L. Stauch

President and Chief Executive Officer

Exhibit 31.2

Certification

I, Mark C. Borin , certify that:

1. I have reviewed this report on Form 10-K of Pentair plc;

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

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

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 19, 2019

/s/ Mark C. Borin

Mark C. Borin

Executive Vice President and Chief Financial Officer

Exhibit 32.1

Certification of CEO Pursuant To
18 U.S.C. Section 1350,
As Adopted Pursuant To
Section 906 Of The Sarbanes-Oxley Act Of 2002

In connection with the Annual Report of Pentair plc (the "Company") on Form 10-K for the period ended December 31, 2018 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, John L. Stauch , President and Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that based on my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: February 19, 2019

/s/ John L. Stauch

John L. Stauch

President and Chief Executive Officer

Exhibit 32.2

Certification of CFO Pursuant To
18 U.S.C. Section 1350,
As Adopted Pursuant To
Section 906 Of The Sarbanes-Oxley Act Of 2002

In connection with the Annual Report of Pentair plc (the "Company") on Form 10-K for the period ended December 31, 2018 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Mark C. Borin , Executive Vice President and Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that based on my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: February 19, 2019

/s/ Mark C. Borin

Mark C. Borin

Executive Vice President and Chief Financial Officer

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