

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549**

FORM 10-K

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

For the fiscal year ended December 31, 2019

OR

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

Commission File Number 001-35370

Luxfer Holdings PLC

(Exact Name of Registrant as Specified in Its Charter)

England and Wales

98-1024030

State or Other Jurisdiction of
Incorporation or Organization

I.R.S. Employer Identification No.

Lumns Lane, Manchester, United Kingdom M27 8LN

Address of principal executive offices

Registrant's telephone number, including area code: **+44 (0) 161-300-0700**

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

Title of each class	Symbol	Name of each exchange on which registered
Ordinary Shares, nominal value £0.50 each	LXFR	New York Stock Exchange

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

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

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

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

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

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of the Form 10-K or any amendment to the Form 10-K.

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

Large accelerated filer
Non accelerated filer
Emerging growth company

Accelerated filer
Smaller reporting company

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

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

The aggregate market value of ordinary shares held by non-affiliates of the Registrant was approximately \$640,603,954 based on the last reported sale price of such securities as of June 28, 2019, the last business day of the Registrant's most recently completed second quarter.

The number of shares outstanding of Registrant's only class of ordinary stock on December 31, 2019, was 27,431,283.

DOCUMENTS INCORPORATED BY REFERENCE

Parts of the Registrant's definitive proxy statement for its annual general meeting to be held on June 3, 2020, to be filed no later than 120 days after the end of the fiscal year covered by this annual report, are incorporated by reference in this Form 10-K in response to Part III, Items 10, 11, 12, 13 and 14.

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PART I

Item 1. Business

Background and business overview

Luxfer Holdings PLC ("Luxfer," "the Company," "we") is a global producer of highly-engineered industrial materials focused on sustained value creation using its broad array of technical knowhow and proprietary materials technologies. The company specializes in the design and manufacture of high-performance products for transportation, defense and emergency response, healthcare, and general industrial purposes. Luxfer customers include both end-users of its products and manufacturers that incorporate Luxfer products into finished goods.

We focus primarily on innovations related to magnesium alloys, zirconium chemicals, aluminum alloys and carbon composites. For example, we were the first to develop and patent a rare-earth-containing magnesium alloy (EZ33A) for use in high-temperature aerospace applications, including helicopter gearboxes; we were at the forefront of the commercial development of zirconia-rich mixed oxides for use in automotive catalysis; we were the first to manufacture a high-pressure gas cylinder out of a single piece of aluminum using cold-impact extrusion; and we developed and patented the superforming process and the first superplastic aluminum alloy (AA2004). We have a long history of innovation derived from our strong technical expertise, and we work closely with customers to apply innovative solutions to their most demanding product needs. Our proprietary technologies and technical expertise, coupled with strong customer service and global presence, provide competitive advantages and have established us as leaders in the global markets we serve. We believe that we have leading positions in key product areas, including magnesium aerospace alloys, photo-engraving plates, zirconium chemicals for automotive catalytic converters and high-pressure aluminum and composite cylinders for breathing applications and a wide variety of other uses.

We have a global presence, operating 16 manufacturing plants in the U.S., the U.K., Canada and China, and employ approximately 1,600 people, including temporary staff. We also have joint ventures in Japan and India. In 2019, our net sales were \$443.5 million (2018: \$487.9 million, 2017: \$441.3 million) and our net income was \$3.1 million (2018: \$25.0 million, 2017: \$16.6 million). In 2019, we manufactured and sold approximately 11,000 metric tons of our magnesium products, approximately 2,800 metric tons of our zirconium products (excluding water weight as sold as a solution) and approximately 1.7 million high-pressure gas cylinders.

The original Luxfer Group was formed in 1996 in connection with the management buy-in (the "Management Buy-in") of certain downstream assets of British Alcan. The Management Buy-in was financed by a syndicate of private equity investors. Largely through a leveraged reorganization in 1999, and finally a capital reorganization in 2007, these investors fully exited their original investments in the business.

In October 2012, Luxfer Holdings PLC successfully listed its shares (in the form of American Depositary Shares ("ADSs") evidenced by American Depositary Receipts or "ADRs") on the New York Stock Exchange. On December 11, 2017, we terminated the ADR facility and arranged for the exchange of outstanding ADSs for the underlying ordinary shares. The exchange allows Luxfer shareholders to directly own and publicly trade ordinary shares on the New York Stock Exchange under the symbol "LXFR."

On June 30, 2018, Luxfer Holdings PLC determined that the Company did not meet the criteria to continue as a Foreign Private Issuer, or "FPI." The result of which means, that as of January 1, 2019, the Company is now a Domestic Issuer, conforms with the full listing rules of the New York Stock Exchange and is in full compliance with applicable SEC regulations.

Luxfer operates in two business segments - Elektron and Gas Cylinders.

Elektron Segment

Our Elektron Segment focuses on specialty materials based primarily on magnesium and zirconium. In 2019, sales from our Elektron Segment represented approximately 50% (2018: 51%, 2017: 50%) of our consolidated net sales. Our top ten customers represented 31% of segment sales. No customer represented 10% or more of our Elektron Segment sales.

Key product lines include:

- Advanced lightweight, corrosion-resistant and heat- and flame-resistant magnesium alloys including our dissolvable SoluMag[®] alloy.
- Magnesium powders used in countermeasure flares that protect aircraft from heat-seeking missiles and also for heating pads for self-heating meals used by the military and emergency-relief agencies.
- High-performance zirconium-based materials and oxides used as catalysts and in the manufacture of advanced ceramics, fiber-optic fuel cells, and many other performance products.

- Magnesium, copper, and zinc photoengraving plates for graphic arts and luxury packaging.

Gas Cylinders Segment

Our Gas Cylinders Segment manufactures and markets specialized products using aluminum, titanium and carbon composites. In 2019, sales from our Gas Cylinders Segment represented approximately 50% (2018: 49%, 2017: 50%) of our consolidated net sales. Our top ten customers represented 46% of segment sales. One customer represented 11% of our Gas Cylinders Segment sales with no other customer greater than 10%.

Key product lines include:

- Carbon composite cylinders for self-contained breathing apparatus (SCBA), used by firefighters and other emergency-responders. Our products are also used by scuba divers and personnel in potentially hazardous environments such as mines.
- Aluminum and composite cylinders used for containment of oxygen and other medical gases used by patients, healthcare facilities and laboratories.
- Carbon composite cylinders for compressed natural gas (CNG) and hydrogen containment in alternative fuel (AF) vehicles.
- Lightweight aluminum cylinders for a variety of industrial applications such as fire extinguishers and containment of high-purity specialty gases.
- Lightweight aluminum and titanium panels superformed into highly complex shapes used mainly in the Aerospace and Luxury-Auto industries.

Financial Information about Segments and Geographic Areas

See Note 16 ("Segmental Information") to our consolidated financial statements for further information regarding our operating segments and our geographic areas.

Suppliers and raw materials

Elektron Segment

Key raw materials used by our Elektron Segment are magnesium, zircon sand and rare earths.

The world demand for magnesium is around one million metric tons per year. China provides about 70% of the world supply. Western primary production is, however, significant, from North American suppliers, Dead Sea Magnesium in Israel, RIMA Industrial in Brazil and two smelters in Russia. We purchase approximately half of our magnesium needs from China. We use only U.S.-sourced materials for our products sold to the U.S. military, for which U.S. and Canadian sourcing is mandatory.

We generally purchase raw materials from suppliers on a spot basis under standard terms and conditions. In 2017, we entered into a three-year supply contract with Rio Tinto Alcan for a substantial portion of our aluminum requirements. In addition, we have supply contracts in place with U.S. Magnesium for raw material purchases of magnesium ingot for both military and commercial applications. The military contract covers magnesium purchases through December 31, 2023, whereas the commercial contract covers through December 31, 2021.

We purchase and process zircon sand, which is found in heavy-minerals sand, titanium dioxide and other products. Global production of zircon is estimated at approximately 1.6 million metric tons. We source premium-grade zircon sand from suppliers in South Africa and Australia. We also purchase intermediate zirconium chemicals from suppliers in China; the level of these purchases is based on a number of factors, including required properties and relative market prices.

There are 17 rare earth metals that are reasonably common in nature. Usually found mixed together with other mineral deposits, these rare earths have magnetic and light-emitting properties that make them invaluable to high-technology manufacturers. As they are ingredients in our zirconium chemical and magnesium alloy products, our use of rare earths has expanded over the last few years. Our main requirement is for cerium, which we use in automotive catalysis compounds because of its unique oxygen-storage capabilities.

Gas Cylinders Segment

The largest single raw material purchased by the Gas Cylinders Segment is aluminum. In 2019, we purchased approximately 60% of our aluminum from Rio Tinto Alcan and its associated companies, and aluminum represented approximately 50% of the segment's raw material costs in the year.

The price of aluminum has been somewhat volatile in the past and while we pass on most price movements to our customers, sometimes through contractual cost-sharing formulas, doing so can be more difficult or time consuming with our higher-value products. Whilst we have historically hedged a portion of our exposure to fluctuations in aluminum pricing no hedges were taken out in 2019.

Another key material is high-strength carbon fiber used in our composite products. Our main suppliers are Toray and Mitsubishi. In recent years, carbon fiber shortages have occurred from increased demand for commercial aerospace and military applications. Over time, we have built relationships with our suppliers, providing them predictable requirements and fixed-price annual contracts to encourage successful procurement of our required quota of carbon fiber.

Our end-markets

Key end-markets for Luxfer products fall into four categories:

Transportation (32% of 2019 sales): Many Luxfer products serve a growing need to improve and safeguard the environment in the field of transportation, including our zirconium-based products that reduce automotive emissions; our lightweight magnesium alloys used in fuel-efficient aerospace and automotive designs; and our lightweight, high-pressure carbon composite alternative fuel cylinders that contain clean-burning compressed natural gas and hydrogen. We also superform single sheets of aluminum, magnesium or titanium to create complex, three-dimensional components used in automotive, aerospace and rail components.

Area of Focus	Product	End-market drivers
<i>Alternative fuels</i>	<ul style="list-style-type: none"> Alternative fuel cylinders Bulk gas transportation cylinders 	<ul style="list-style-type: none"> "Clean air" initiatives Abundance of natural gas Favorable tax treatment Increasing CNG filling infrastructure
<i>Environmental catalysts (cleaning of exhaust emissions)</i>	<ul style="list-style-type: none"> Zirconium compounds with specific properties used in auto-catalysis washcoats 	<ul style="list-style-type: none"> Emissions legislation and regulation generally Cost effective for vehicle manufacturers as they reduce the use of precious metals Increasing demand for gasoline-electric hybrid vehicles
<i>Specialty / high-end automotive</i>	<ul style="list-style-type: none"> Superformed complex body panels, doors and trunk assemblies and other high-strength components Magnesium extrusions 	<ul style="list-style-type: none"> Fuel efficiency for a given level of performance Increased flexibility for vehicle designers in terms of complex shapes and strength Strong demand for top-end cars from affluent customers, typically in emerging markets
<i>Sensors, piezoelectrics and electro-ceramics</i>	<ul style="list-style-type: none"> Zirconium-based ceramic materials used in sensors of engine management systems 	<ul style="list-style-type: none"> Engine efficiency Control of exhaust gases
<i>Rail transport</i>	<ul style="list-style-type: none"> Superformed train front-cab and internal components 	<ul style="list-style-type: none"> Government investment in public transport Fuel efficiency Safety requirements for moving from plastic to metal for internal components
<i>Civil aerospace</i>	<ul style="list-style-type: none"> Superform (wing leading edges, engine nacelle skins, winglets) Elektron® aerospace alloys in cast, extruded, and sheet form 	<ul style="list-style-type: none"> Growing aircraft build rate Increasing cost of fuel Increased vehicle design / sophistication
<i>Helicopters</i>	<ul style="list-style-type: none"> Magnesium sand-casting alloys, superformed panels 	<ul style="list-style-type: none"> Lightweighting Fuel efficiency

Defense and emergency response (27% of 2019 sales) : Luxfer offers several products that address principal factors driving growth in this market, such as heightened societal expectations regarding protection of people, equipment and property during conflicts and emergencies. Our products include magnesium powders for countermeasure flares that defend aircraft against heat-seeking missile attack and for flameless heaters used in meals, life-support cylinders for firefighters and other emergency-service personnel, fire extinguisher cylinders, and chemical agent detection and decontamination products.

Area of Focus	Product	End-market drivers
<i>Life-support breathing apparatus</i>	<ul style="list-style-type: none"> • Composite cylinders used in SCBA 	<ul style="list-style-type: none"> • Increased awareness of importance of properly equipping firefighting services post 9/11 • Demand for lightweight products to upgrade from heavy all-metal cylinders • Periodic upgrade of new U.S. National Institute for Occupational Safety and Health (NIOSH) standards and natural replacement cycles • Asian and European fire services looking to adopt more modern SCBA equipment
<i>Fire protection</i>	<ul style="list-style-type: none"> • Cylinders (CO₂ fire extinguishers) 	<ul style="list-style-type: none"> • New commercial buildings • Cylinder replacement during annual servicing
<i>Countermeasures</i>	<ul style="list-style-type: none"> • Ultra-fine magnesium powders for flares used to protect aircraft from attack by heat-seeking missiles 	<ul style="list-style-type: none"> • Use in combat and training • Maintenance of countermeasures reserves (shelf-life restrictions)
<i>Military vehicles</i>	<ul style="list-style-type: none"> • Elektron® magnesium alloys in cast rolled, and extruded forms 	<ul style="list-style-type: none"> • Maintaining high level of protection while reducing weight to improve maneuverability and fuel economy
<i>Military personnel and emergency relief agencies</i>	<ul style="list-style-type: none"> • Self-heating meals used by military personnel and emergency-relief agencies • Chemical detection and chemical decontamination kits 	<ul style="list-style-type: none"> • Ensuring protection and well-being for military personnel and victims of natural disasters • Use in combat and training and in response to terrorist activities

Healthcare (5% of 2019 sales): Luxfer has a long history serving the healthcare end-market, and we see this as a major area for the introduction of new products and solutions. These include lightweight aluminum and composite cylinders for containment of medical and laboratory gases; zirconium powders for pharmaceutical products; magnesium materials for lightweight orthopedic devices; specialized magnesium alloys for cardiovascular stents and implants; and zirconium materials for biomedical applications and dental implants.

Area of Focus	Product	End-market drivers
<i>Medical gases</i>	<ul style="list-style-type: none"> • Portable aluminum and composite cylinders • Portable oxygen concentrators 	<ul style="list-style-type: none"> • Growing use of medical gases • Shift to paramedics, who need portable, lightweight products • Growing trend to provide oxygen therapy in the home and to keep patients mobile • Increasingly aging population • Increase in respiratory diseases
<i>Medical equipment casings</i>	<ul style="list-style-type: none"> • Superformed panels (e.g., for MRI scanners) 	<ul style="list-style-type: none"> • Growing use of equipment using powerful magnets and consequent need for non-ferrous, hygienic casings
<i>Pharmaceutical industry</i>	<ul style="list-style-type: none"> • Magnesium powders as a catalyst for chemical synthesis (Grignard process) 	<ul style="list-style-type: none"> • Growth in pharmaceutical industry
<i>Orthopedics</i>	<ul style="list-style-type: none"> • Magnesium sheets 	<ul style="list-style-type: none"> • Improved mobility through use of easy-to-wear, lightweight braces and trusses
<i>Sorbents</i>	<ul style="list-style-type: none"> • MELsorb® material being developed as active ingredient in dialysis equipment and enterosorbents 	<ul style="list-style-type: none"> • Growth in kidney problems • New technologies to remove noxious elements from the body

General industrial (36% of 2019 sales): Our core technologies have enabled us to serve various other markets and applications. Our products include zirconium-based compounds to purify drinking water and clean industrial exhausts; magnesium alloys shaped for use in various general engineering applications; and high-pressure gas cylinders used for high-purity specialty gases, beverage dispensing, scuba diving and performance racing. Metal foil-stamping and embossing dies are used primarily for luxury packaging, labels and greeting cards. Our high-quality magnesium, copper, brass and zinc plates are ideal for these and other graphic applications.

Area of Focus	Product	End-market drivers
<i>Specialty gases</i>	• Inert-interior aluminum cylinders for high-purity gases	<ul style="list-style-type: none"> • Semiconductor and electronics industries • Pharmaceutical industry growth • Specialized laboratory requirements • Oil exploration
<i>Leisure activities</i>	• Cylinders for SCUBA diving, car and boat racing	<ul style="list-style-type: none"> • Leisure time • Growth of middle class in emerging markets
<i>General engineering</i>	<ul style="list-style-type: none"> • Magnesium billets, sheets, coil, tooling plates • Zirconium ceramic compounds for hard working components 	<ul style="list-style-type: none"> • Economic growth • Need for components to operate in more extreme environments for longer periods, such as underground or in the ocean
<i>Hydraulic fracturing or "fracking"</i>	• Dissolvable SoluMag [®] magnesium alloy	• Onshore shale gas exploration linked to increasing energy demand
<i>Paper</i>	• Bacote [™] and Zirmel [™] , both formaldehyde-free insolubilizers that aid high-quality printing	• Elimination of toxic chemicals
<i>Graphic arts</i>	• Photo-engraving plates	• Luxury packaging as part of marketing high-end products

Our competitive advantages

Focus on innovation and product development for growing specialized end-markets. We continue to produce a steady stream of new products, including those developed in close collaboration with our customers.

Strong technical expertise and know-how. Using our expertise in metallurgy and material science, we specialize in advanced materials, developing products and materials with superior performance to satisfy the most demanding requirements in the most extreme environments. Further, we benefit from the fact that a growing number of our products are patented, including many of our alloys and compounds.

Diversified customer base with long-standing relationships. We put the customer at the heart of our strategy, and we have long-standing relationships with many of our customers, including global leaders in our key markets.

Our Business Excellence Standard Toolkit. The "Luxfer B.E.S.T. Model," consists of the following key themes:

- A common set of values that drives accountability, innovation, customer first, personal development, teamwork and integrity.
- Disciplined capital allocation with the aim of maximizing organic growth and the product portfolio value through value-enhancing acquisitions and divestitures.
- Balanced score-card used in an effort to continuously improve employee performance in an effort to help translate our vision into actionable individual goals and ensure that employee compensation is commensurate with individual performance.
- A published Customer Charter designed to enable us to retain and grow our customer base and capture additional market share.
- A lean enterprise philosophy that helps drive operational process excellence in all functions including, sales, marketing, innovation, human resources, supply, manufacturing, information technology and finance.

Seasonality

We have shutdown periods at most of our manufacturing sites during which we carry out maintenance work. Shutdowns typically last two weeks in the summer and one to two weeks around the year-end holidays, resulting in reduced levels of activity in the second half of the year compared to the first half. Third-quarter and fourth-quarter sales and operating profit can be affected by our own shutdowns and by shutdowns by various industrial customers. In particular, we have found that our fourth-quarter results are generally lower, since many customers reduce production activity from late November through December. We also operate in various geographic areas that are susceptible to bad weather during winter months, such as Calgary, Canada, and various U.S. eastern states. Bad weather can unexpectedly disrupt production and shipments from our manufacturing facilities, which can lead to reduced revenue and operating profits. We also manufacture products that are used in graphic arts and premium packaging, demand for which increases in the run up to the year-end holidays.

Research and Development

Luxfer recognizes the importance of research in materials science and the need to develop innovative new products to meet future needs of customers and to continue providing growth opportunities for the business. Each year, we invest in the development of new products and processes directed towards transportation, defense and emergency response, healthcare and general industrial end-markets. Direct expenditures on research and development amounted to \$5.7 million in 2019 (2018: \$6.4 million; 2017: \$7.8 million). Our product development projects also include utilizing skills of our wider commercial technical sales staff and general management, many of whom are highly qualified scientists and engineers. A large proportion of senior sales and management time is spent overseeing development of products and working with customers on integrating our products and solutions into their product designs.

To provide customers with improving products and services, we invest in new technology and research and employ some of the world's leading specialists in materials science and metallurgy. Our engineers and metallurgists collaborate closely with our customers to design, develop and manufacture our products. We also co-sponsor ongoing research programs at major universities in the U.S., Canada and Europe. Thanks to the ingenuity of our own research and development teams, Luxfer has developed a steady stream of new products, most recently including:

- soluble magnesium alloys, branded SoluMag[®], for down-well oil and gas applications;
- ultra-lightweight large composite cylinders, branded G-Stor[™], for containment of CNG, hydrogen, helium and other gases;
- enabling technologies for AF systems, including high-pressure valves, branded G-Flo[™], and pressure-release devices;
- zirconium catalysts for large-scale industrial chemical applications;
- L7X[®] higher-strength aluminum alloy and carbon composite gas cylinders;
- Luxfer ECLIPSE, a new carbon composite cylinders for firefighter self-contained breathing apparatus (SCBA);
- bioresorbable magnesium alloys, branded SynerMag[®]; and
- zirconium sorbents, branded MELsorb[®], being developed for use as an active ingredient in kidney dialysis equipment.

We believe that our commitment to research and new product development, through dedicated resources and significant use of management's time, is the core of Luxfer's growth potential worldwide. This commitment reflects our strategy of focusing on high-performance, value-added product lines and markets and leveraging our collaboration with universities. We invest in developing products for end-markets that we believe have long-term growth potential.

Intellectual Property

We rely on a combination of patents, trade secrets, copyrights, trademarks, proprietary manufacturing processes and design rights, together with non-disclosure agreements and technical measures, to establish and protect proprietary rights in our products. Our Elektron Segment holds key patents related to protection applications, including numerous aerospace alloys and magnesium-gadolinium alloys, as well as patents related to environmental applications, including water-treatment products and our specialized G4 process used to manufacture zirconium-cerium oxides for emissions-control catalysts. The segment also has patented technology for magnesium-based flameless heater pads used to heat meals and beverages. Key patents held by our Gas Cylinders Segment relate to aluminum alloys for pressurized hollow bodies and superplastic-forming techniques.

In certain areas, we rely more heavily upon trade secrets and unpatented proprietary know-how than patent protection in order to establish and maintain our competitive advantage. We generally enter into non-disclosure and invention assignment agreements with our employees and subcontractors.

Available Information

Our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and any exhibits or amendments to these are made available, free of charge on our website at <http://www.luxfer.com> as soon as reasonably practicable after we electronically file such reports with, or furnish them to, the Securities and Exchange Commission ("SEC"). Information on our website is not incorporated by reference herein and is not a part of this report.

Financial and other material information regarding the company is routinely posted and accessible on our website at <http://www.luxfer.com/investors>.

Item 1A. Risk Factors

The risks described below are not the only risks facing us. Any of the following risks could materially and adversely affect our business, financial condition or results of operations. Additional risks and uncertainties not currently known to us or those we currently view to be immaterial may also materially and adversely affect our business, financial condition or results of operations. See also "Information Regarding Forward-Looking Statements" for certain warnings regarding forward-looking information contained in this document.

Risks Relating to Our Operations

We depend on certain end-markets, including automotive, alternative fuels, self-contained breathing apparatus, aerospace and defense, healthcare, oil and gas and printing and paper. An economic downturn, or regulatory changes, in any of those end-markets, could reduce sales and profit margins on those end-markets.

We have significant exposures to certain end-markets, including some end-markets that are cyclical in nature or subject to high levels of regulatory control, including automotive, self-contained breathing apparatus ("SCBA"), aerospace and defense and printing and paper. Dependence of either of our segments on certain end-markets is even more pronounced.

To the extent that any of these cyclical end-markets are in decline, at a low point in their economic cycle, or subject to regulatory change, sales and margins on those sales may be adversely affected. It is possible that all or most of these end-markets could be in decline at the same time, such as during a recession. Any significant reduction in sales could have a material adverse impact on our results of operations, financial position and cash flows.

Our global operations expose us to economic conditions, potential tax costs, political risks and specific regulations or restrictions in the countries in which we operate, which could have a material adverse impact on our results of operations, financial position and cash flows.

We derive our sales and earnings from operations in many countries and are subject to risks associated with doing business internationally. We have wholly-owned operations in the U.S., the U.K., Canada, China and Australia; and joint venture facilities in India and Japan. Doing business in different countries has risks, including the potential for adverse changes in the local social, political, financial or regulatory climate, difficulty in staffing and managing geographically diverse operations, and the costs of complying with a variety of laws and regulations. For example the change in the political climate in the U.S. and imposition of tariffs could make it more challenging or expensive to import products manufactured in Europe.

Due to the fact we have operations in many countries, we are also liable to pay taxes in many fiscal jurisdictions. Our tax burden depends on the interpretation of local tax regulations, bilateral or multilateral international tax treaties and the administrative doctrines in each jurisdiction. Changes in these tax regulations may increase our tax burden, or otherwise affect our accounting for taxes. For example, as a result of the reduction in the statutory corporate income tax rate in the U.S. pursuant to the Tax Cut and Jobs Act (TCJA) enacted on December 22, 2017, we recorded a reduction in the value of our deferred tax assets in the U.S. of \$4.0 million in 2017. Moreover, the principal markets for our products are located in North America, Europe and Asia, and any financial difficulties experienced in these markets may have a material adverse impact on our businesses. For example, the maturity of some of our markets, particularly the U.S. medical oxygen cylinder market and the European fire extinguisher market, could require us to increase sales in developing regions, which may involve greater economic and political risks. We cannot provide any assurances that we will be able to expand sales in these regions. Any of these factors could have a material adverse impact on our results of operations, financial position and cash flows.

On June 23, 2016, the U.K. held a referendum in which voters approved an exit from the European Union (the "E.U."), commonly referred to as 'Brexit'. On March 29, 2017, the U.K. Government invoked Article 50 of the Treaty on the European Union, which was expected to result in the U.K. leaving the E.U. on March 29, 2019 but was subsequently twice deferred with the Withdrawal Agreement taking effect on January 31, 2020. Following the exit there is an eleven month transition period during which existing E.U. rules and regulations will continue to apply to the U.K. pending agreement on the future trading arrangements, currently required to be achieved by December 31, 2020. It is possible that following agreement, the new relationship will result in greater restrictions on imports and exports between the U.K. and E.U. countries, the U.S. and other markets with increased regulatory complexity. There is also the potential for disruption to the movement of raw materials and finished goods in the event that no agreement is reached by the end of the transition period. These changes may adversely affect our operations and financial results. See also "—Changes in foreign exchange rates could reduce profit margins on our sales and reduce the reported sales of our non-U.S. operations and have a material adverse effect on our results of operations."

We may not be able to consummate, finance or successfully integrate future acquisitions into our business, which could hinder our strategy or result in unanticipated expenses, losses or charges.

As part of our strategy, we have supplemented and may continue to supplement organic growth by acquiring companies or operations engaged in similar or complementary businesses. If the consummation of future acquisitions, together with integration of acquired companies and businesses excessively diverts management's attention from the operations of our existing businesses, operating results could suffer. Any acquisition made could be subject to a number of risks, including:

- failing to discover liabilities of the acquired company or business for which we may be responsible as a successor owner or operator, including litigation or environmental costs and liabilities;
- difficulties associated with the assimilation of operations and personnel of the acquired company or business, creating uncertainty for employees, customers and suppliers;
- increased debt service requirements as a result of increased indebtedness to complete acquisitions;
- the loss of key personnel in the acquired company or business;
- a negative effect on our financial results resulting from an impairment of acquired intangible assets, the creation of provisions, or write downs; and / or
- potential adverse effects on our stock price and dividend amount due to the issuance of additional stock.

We cannot ensure that every acquisition will ultimately provide the benefits originally anticipated, which could ultimately have a material adverse impact on our results of operations, financial position and cash flows.

Our operations rely on a number of large customers in certain areas of our business, and the loss of any of our major customers could negatively impact our results of operations.

If we fail to maintain our relationships with our major customers, or fail to replace lost customers, or if there is reduced demand from our customers or for products produced by our customers, such failures or reduced demand could materially reduce our sales. In addition, we could experience a reduction in sales if any of our customers fail to perform or default on any payment pursuant to our contracts with them. Long-term relationships with customers are especially important for suppliers of intermediate materials and components such as ourselves. We often work closely with customers to develop products that meet particular specifications as part of the design of a product intended for an end-user market. The bespoke nature of many of our products could make it difficult to replace lost customers. Our top 10 customers accounted for approximately 25% of our net sales in 2019. Any significant reduction in sales or customer payment default could have an adverse material impact on our results of operations, financial position and cash flows.

Competitive pressures could materially and adversely affect our sales and profit margins.

The markets for many of our products are now increasingly global and highly competitive, especially in terms of quality, price and service. Due to the highly competitive nature of some markets in which we operate, we may have difficulty raising prices to offset increases in the costs of raw materials. For example, the U.S. medical oxygen cylinder market has a number of dedicated producers with excess capacity, making it very difficult for us to raise customer prices to offset aluminum cost increases. In addition, rising aluminum costs could lead to the development of alternative products that use lower cost materials, which could become favored by end-market users and thereby lead to a decline in the demand for our products.

We also experience competition from developing countries where manufacturers may benefit from lower labor costs. We are also affected by Western-based competitors that have chosen to relocate production to Asia to take advantage of lower labor costs. Competitors with operations in these regions may be able to produce goods at a relatively lower cost, which may enable them to offer highly competitive selling prices.

Competition with respect to less-complex zirconium chemicals has been particularly intense, with Chinese suppliers providing low-cost feedstock to specialist competitors, making it especially difficult to compete in commodity products such as paper-making additives. Chinese magnesium also continues to be imported into Europe in large volumes, which may impact our competitive position in Europe regarding certain magnesium alloys. More generally, we may face potential competition from producers that manufacture products similar to our aluminum-based, magnesium-based and zirconium-based products using other materials, such as steel, plastics, composite materials or other metals, minerals and chemicals. Products manufactured by competitors using different materials might compete with our products in terms of price, weight, engineering characteristics, recyclability or other grounds.

We may also enter new markets in which there are established competitors. We expect to face new and significant challenges in our effort to enter into these highly competitive markets in which we did not have a presence historically. For example, in recent years, we have entered markets focused on the containment of compressed natural gas (CNG) and incurred startup costs along with strong competitive pressures from existing

providers of similar cylinder technologies. Even if we are able to enter into these new markets initially, we may not be able to sustain the effort on a long-term basis or establish sufficient market share to achieve meaningful returns from our investment.

Other parts of our operations manufacture and sell products that satisfy customer specifications. Competitors may develop lower cost or better performing products, and customers may not be willing to pay a premium for advantages offered by our products.

In addition, governments may impose import and export restrictions, grant subsidies to local companies and implement tariffs and other trade protection regulations and measures that may give competitive advantages to certain of our competitors and adversely affect our business.

Any of these factors could have a material adverse impact on our results of operations, financial position and cash flows.

We depend upon our larger suppliers for a significant portion of our raw materials, and a loss of one of these suppliers, or a significant supply interruption could negatively impact our financial performance.

We rely, to varying degrees, on major suppliers for some of the principal raw materials of our engineered products, including aluminum, zirconium and carbon fiber. For example, in 2019, we obtained approximately 60% of our aluminum, the largest single raw material purchased by the Gas Cylinders Segment, from Rio Tinto Alcan and its associated companies. Moreover, demand for carbon fiber is increasing, which has led to occasional periods of short supply in recent years with a number of expanding applications competing for the same supply of this specialized raw material. Our largest suppliers of carbon fiber are Toray and Grafil, a subsidiary of Mitsubishi Chemical. For additional details of some of our major suppliers (see ITEM 1 - Suppliers and raw materials).

We generally purchase raw materials from suppliers on a spot basis under standard terms and conditions. In 2017, we entered into a three-year supply contract with Rio Tinto Alcan for a substantial portion of our aluminum requirements. In addition, we have supply contracts in place with U.S. Magnesium for raw material purchases of magnesium ingot for both military and commercial applications. The military contract covers magnesium purchases through December 31, 2023, whereas the commercial contract covers through December 31, 2021.

An interruption in the supply of essential raw materials used in our production processes or an increase in the costs of raw materials due to market shortages, supplier financial difficulties, government quotas or natural disturbances such as the recent outbreak of the covid-19 coronavirus, could significantly affect our ability to provide competitively priced products to customers in a timely manner. In the event of a significant interruption in the supply of any materials used in our production processes, or a significant increase in their prices (as we have experienced, for example, at different times with aluminum, magnesium and rare earths), we may have to purchase these materials from alternative sources, build additional inventory of raw materials, increase our prices, reduce our margins or possibly fail to fill customer orders by deadlines required in contracts, which could result in, among other things, contractual penalties. We can provide no assurance that we would be able to obtain replacement materials quickly on similar terms or at all. Failure to maintain relationships with key suppliers or to develop relationships with alternative suppliers could have a material adverse effect on our results of operations, financial position and cash flows.

We are exposed to fluctuations in the costs of the raw materials that are used to manufacture our products, and such fluctuations could lead us to incur unexpected costs and could affect our margins and / or working capital requirements.

The primary raw material we use to manufacture gas cylinders and superformed panels is aluminum supplied in billet and sheet form. The cost of aluminum is subject to both significant short-term price fluctuations and to longer-term cyclicity as a result of international supply and demand relationships. In 2019, the London Metal Exchange ("LME") three-month cost of aluminum reached a high of just below \$2,000 per metric ton and a low of just above \$1,700 per metric ton. The delivery premiums added by suppliers to the LME price also fluctuate, for example: the Midwest Aluminum Premium for physical supply of aluminum billet in the U.S. has historically averaged around \$200 per metric ton, but in 2015 rose to a high of \$535 per metric ton then fell to a low of \$155 per metric ton. We have experienced significant volatility in other raw material costs in the last few years, such as primary magnesium, carbon fiber, zircon sand and rare earths. See ITEM 1.

Fluctuations in the costs of these raw materials could affect margins and working capital requirements in the businesses in which we use them, see ITEM 7. We cannot always pass on cost increases or increase our prices to offset these cost increases immediately or at all, whether because of fixed-price agreements with customers, competitive pressures that restrict our ability to pass on cost increases or increase prices, or other factors. It can be particularly difficult to pass on cost increases or increase prices in product areas such as gas cylinders, where competitors offer similar products made from alternative materials, such as steel, if those materials are

not subject to the same cost increases. Higher prices necessitated by large increases in raw material costs could make our current or future products unattractive compared to competing products made from alternative materials that have not been so affected by raw material cost increases, or compared to products produced by competitors who have not incurred such large increases in their raw material costs.

In addition, pricing of raw materials, such as aluminum, may be impacted by the level of tariffs imposed on imports. President Trump announced in March 2018 a 10% tariff on aluminum imported into the U.S. The Company uses a substantial amount of aluminum in its products, with imports into the U.S. primarily originating from Canada. The tariffs were subsequently suspended in May 2019, paving the way for ratification of the United States-Mexico-Canada agreement ("USMCA"), which was approved by the United States on January 29, 2020. While the imposition of the temporary tariff did not have a major adverse impact on our business, if the tariff were to be reimposed at a higher level, then the price of affected imported materials could increase substantially and the price of U.S.-made aluminum could also increase substantially.

If the cost of aluminum were to rise, we may not be able pass those cost increases on to our customers or manage the exposure effectively through hedging instruments. From time to time we use derivative financial instruments to hedge our exposures to fluctuations in aluminum costs. Although it is our treasury policy to enter into these transactions only for hedging and not for speculative purposes, we are exposed to market risk and credit risk with respect to the use of these derivative financial instruments, see ITEM 7A. In addition, if we have hedged our metal position, a fall in the cost of aluminum might give rise to hedging margin calls to the detriment of our borrowing position.

In the past several years we have made additional purchases of large stocks of magnesium alloys in an effort to delay the effect of potentially increased costs in the future. However, even though such purchases are not made for speculative purposes, there can be no assurance that costs will move as expected.

Moreover, these strategic purchases increase our working capital needs, thus reducing our liquidity and cash flow.

Accordingly, a substantial increase in raw material costs could have a material adverse effect on our results of operations, financial position and cash flows.

We are exposed to fluctuations in costs of utilities that are used in the manufacture of our products, and such fluctuations could lead us to incur unexpected costs and could affect our margins and results of operations.

Our utility costs, which constitute another major input cost of our total expenses and include costs related to electricity, natural gas and water, may be subject to significant variations. Increased taxation and other factors have contributed in the past to a significant increase in utility costs for us, particularly with respect to the price that we pay for our U.K. energy supplies.

Fluctuations in the costs of these utilities could affect margins in our businesses in which we use them. We cannot always pass on cost increases or increase our prices to offset cost increases immediately or at all, whether because of fixed-price agreements with customers, competitive pressures that restrict our ability to pass on cost increases or increase prices, or other factors. It can be particularly difficult to pass on cost increases or increase prices in product areas such as gas cylinders, where competitors offer similar products made from alternative materials, such as steel, if those materials are not subject to the same cost increases. As a result, a substantial increase in utility costs could have a material adverse effect on our results of operations, financial position and cash flows.

Changes in foreign exchange rates could reduce profit margins on our sales and reduce the reported sales of our non-U.S. operations and have a material adverse effect on our results of operations.

We conduct a large portion of our commercial transactions, purchases of raw materials and sales of goods in various countries and regions, including the U.S., the U.K., continental Europe, Australia and Asia. Our manufacturing operations based in the U.S., continental Europe and Asia usually purchase raw materials and sell goods denominated in their local currency, but our manufacturing operations in the U.K. often purchase raw materials and sell products in different currencies. Changes in the relative values of currencies can decrease the profits of our subsidiaries when they incur costs in currencies that are different from the currencies in which they generate all or part of their revenue. These transaction risks principally arise as a result of purchases of raw materials in U.S. dollars, coupled with sales of products to customers in euros. This impact is most pronounced in our exports to continental Europe from the U.K. In 2019, our U.K. operations sold approximately €70 million of goods into the Eurozone. Our policy is to hedge a portion of our net exposure to fluctuations in exchange rates with forward foreign currency exchange contracts. Therefore, we are exposed to market risk and credit risk through the use of derivative financial instruments. Moreover, any failure of hedging policies could negatively impact our profits, and thus damage our ability to fund our operations and to service our indebtedness. Further

exchange rate volatility has been experienced during 2019 with GBP sterling reaching a five-year low against both the U.S. dollar and euro in August and until the terms of the U.K.'s future relationship with the E.U. are known, continued volatility is to be expected.

In addition to subsidiaries and joint ventures in the U.S., we have operating subsidiaries located in the U.K., Canada, China and Australia, as well as joint ventures in Japan and India, whose revenue, costs, assets and liabilities are denominated in local currencies. As our consolidated financial statements are reported in U.S. dollars, we are exposed to fluctuations in those currencies when those amounts are translated to U.S. dollars for purposes of reporting our consolidated financial statements, which may cause declines in results of operations. The largest risk is from our operations in the U.K., which in 2019 generated an operating profit of \$1.9 million and net sales of \$156.0 million. Fluctuations in exchange rates, particularly between the U.S. dollar and GBP sterling (which has been subject to significant fluctuations, as described above), can have a material effect on our consolidated income statement and consolidated balance sheet. In 2019, movements in the average U.S. dollar exchange rate had a negative impact on net sales of \$9.5 million; in 2018 movements in the average U.S. dollar exchange rate had a positive impact on net sales of \$2.5 million. Changes in translation exchange rates increased net assets by \$3.1 million in 2019, compared to a decrease of \$6.4 million in 2018.

These foreign exchange risks could have a material adverse effect on our results of operations, financial position and cash flows. For additional information on these risks, and the historical impact on our results, see ITEM 7A.

Our defined benefit pension plans have funding deficits and are exposed to market forces that could require us to make increased ongoing cash contributions in response to changes in market conditions, actuarial assumptions and investment decisions. These market forces could expose us to significant short-term liabilities if a wind-up trigger occurred in relation to such plans, each of which could have a material adverse impact on our results of operations and financial position.

We have defined benefit pension arrangements in the U.K. and in the U.S., see ITEM 8, note 13. Our largest defined benefit plan, the Luxfer Group Pension Plan, which closed to new members in 1998, remained open for accrual of future benefits based on career-average salary until April 5, 2016. However, following a consultation, it was agreed with the trustees and plan members to close the Luxfer Group Pension Plan in the U.K. to future accrual of benefits, effective from April 5, 2016. Moreover, for the purpose of increasing pensions in payment, it was agreed to use the CPI as the reference index, in place of the RPI where applicable. The Luxfer Group Pension Plan is funded according to the regulations in effect in the U.K. and, as of December 31, 2019, and December 31, 2018, had an accounting deficit of \$30.5 million and \$31.8 million, respectively. Luxfer Group Limited is the principal employer under the Luxfer Group Pension Plan, and other U.K. subsidiaries also participate under the plan. Our other defined benefit plans are less significant than the Luxfer Group Pension Plan and, as of December 31, 2019, and December 31, 2018, had aggregate accounting deficits of \$4.7 million and \$8.2 million, respectively. The largest of these additional plans is the BA Holdings, Inc. Pension Plan in the U.S., which was closed to further benefit accruals in December 2005, and merged with the much smaller Luxfer Hourly Pension Plan, effective January 1, 2016. According to the actuarial valuation of the Luxfer Group Pension Plan as of April 5, 2018, being the date of the last triennial valuation, the Luxfer Group Pension Plan had a deficit of £26.5 million on a plan-specific basis. Should a wind-up trigger occur in relation to the Luxfer Group Pension Plan, the buy-out deficit of that plan will become due and payable by the employers. The aggregate deficit of the Luxfer Group Pension Plan on a buy-out basis was estimated at £145 million as of April 5, 2018. The trustees have the power to wind-up the Luxfer Group Pension Plan if they consider that in the best interests of members there is no reasonable purpose in continuing the Luxfer Group Pension Plan.

As a result of the actuarial valuation as of April 5, 2018, we are required to continue to make ongoing cash contributions, over and above normal contributions required to meet the cost of future accrual, to the Luxfer Group Pension Plan. These additional payments are intended to reduce the funding deficit. We have agreed with the trustees to a schedule of annual payments of £4.1 million (\$5.3 million at current exchange rates) to reduce the deficit. These contributions are to apply until the deficit is eliminated (which is expected to occur by the end of 2022), but in practice the schedule will be reviewed and may be revised following the next triennial actuarial valuation in April 2021. Regulatory burdens have also proved to be a significant risk, such as the U.K.'s Pension Protection Fund Levy, which was £0.3 million in 2019.

We are exposed to various risks related to our defined benefit plans, including the risk of loss of market value of the plan assets, the risk of actual investment returns being less than assumed rates of return, the trustees of the Luxfer Group Pension Plan switching investment strategy (which does require consultation with the employer) and the risk of actual experience deviating from actuarial assumptions for such things as mortality of plan participants. In addition, fluctuations in interest rates cause changes in the annual cost and benefit obligations. Any of these risks could have a material adverse impact on our results of operations, financial position and cash flows.

The Pensions Regulator in the U.K. has the power in certain circumstances to issue contribution notices or financial support directions that, if issued, could result in significant liabilities arising for us.

The Pensions Regulator may issue a contribution notice to the employers that participate in the Luxfer Group Pension Plan, or any person who is connected with, or is an associate of, these employers where the Pensions Regulator is of the opinion that the relevant person has been a party to an act, or a deliberate failure to act, which had as its main purpose (or one of its main purposes) the avoidance of pension liabilities or where such act has a materially detrimental effect on the likelihood of payment of accrued benefits under the Luxfer Group Pension Plan being received. A person holding alone or together with his or her associates, directly or indirectly, one-third or more of our voting power, could be the subject of a contribution notice. The terms "associate" and "connected person," which are taken from the Insolvency Act 1986, are widely defined and could cover our significant shareholders and others deemed to be shadow directors. If the Pensions Regulator considers that a plan employer is "insufficiently resourced" or a "service company" (which terms have statutory definitions), it may impose a financial support direction requiring such plan's employer or any member of the Group, or any person associated or connected with an employer, to put in place financial support in relation to the Luxfer Group Pension Plan. Liabilities imposed under a contribution notice or financial support direction may be up to the difference between the value of the assets of the Luxfer Group Pension Plan and the cost of buying out the benefits of members and other beneficiaries of the Luxfer Group Pension Plan. In practice, the risk of a contribution notice being imposed may restrict our ability to restructure or undertake certain corporate activities. Additional security may also need to be provided to the trustees of the Luxfer Group Pension Plan before certain corporate activities can be undertaken (such as the payment of an unusual dividend), and any additional funding of the Luxfer Group Pension Plan may have a material adverse effect on our financial position and cash flows.

Our ability to remain profitable depends on our ability to protect and enforce our intellectual property, and any failure to protect and enforce such intellectual property could have a material adverse impact on our results of operations and financial position.

We cannot ensure that we will always have the ability to protect proprietary information and our intellectual property rights. We protect our intellectual property rights (within the U.S., Europe and other countries) through various means, including patents and trade secrets. Due to the difference in foreign trademark, patent and other laws concerning proprietary rights, our intellectual property rights may not receive the same degree of protection in other countries as they would in the U.S. or the U.K. The patents we own could be challenged, invalidated or circumvented by others and may not be of sufficient scope or strength to provide us with any meaningful protection or commercial advantage. Further, competitors may infringe our patents and the costs of protecting our patents could be significant. We cannot assure you that we will have adequate resources to enforce our patents. Our patents will only be protected for the duration of the patent. Some of our older key patents have expired, and others will expire over the next few years. As a result, our competitors may introduce products using the technology previously protected, and these products may have lower prices than our products, which may negatively affect our market share. To compete, we may need to reduce our prices for those products. Additionally, the expiry of certain of those patents has reduced, or will reduce, barriers to entry to possible competitors for certain products and end-markets. With respect to our unpatented proprietary technology, it is possible that others will independently develop the same or similar technology or obtain access to our unpatented technology. To protect our trade secrets and other proprietary information, we require employees, consultants, advisors and collaborators to enter into confidentiality agreements. Nevertheless, we cannot assure you that these agreements will provide meaningful protection for our trade secrets, know-how or other proprietary information in the event of any unauthorized use, misappropriation or disclosure of such trade secrets, know-how or other proprietary information. We rely on our trademarks, trade names and brand names to distinguish our products from the products of our competitors, and we have registered or applied to register many of these trademarks. Third parties may also oppose our trademark applications, or otherwise challenge our use of the trademarks. In the event that our trademarks are successfully challenged, we could be forced to rebrand our products, which could result in loss of brand recognition and could require us to devote resources to advertising and marketing new brands. Further, we cannot assure you that competitors will not infringe our trademarks or that we will have adequate resources to enforce our trademarks.

Any failure to maintain, protect and enforce our intellectual property or the expiry of patent protection could have a material adverse impact on our results of operations, financial position and cash flows.

Expiration or termination of our right to use certain intellectual property granted by third parties, the right of those third parties to grant the right to use the same intellectual property to our competitors, and the right of certain third parties to use certain intellectual property used as part of our business, could have a material adverse impact on our results of operations, financial position and cash flows.

We have negotiated, and may from time to time in the future negotiate, licenses with third parties with respect to third party proprietary technologies used in certain of our manufacturing processes and products. If any of these licenses expire or terminate, we will no longer retain the rights to use the relevant third party proprietary technologies in our manufacturing processes and products, which could have a material adverse effect on our results of operations, financial position and cash flows. Further, the rights granted to us might be non-exclusive, which could result in our competitors gaining access to the same intellectual property.

Some of our patents may cover inventions that were conceived or first reduced to practice under, or in connection with, government contracts or other government funding agreements or grants. With respect to inventions conceived or first reduced to practice under such government funding agreements, a government may retain a non-exclusive, irrevocable, royalty-free license to practice, or have practiced for or on behalf of the relevant country, the invention throughout the world. In addition, if we fail to comply with our reporting obligations, or to adequately exploit the developed intellectual property under these government funding agreements, the relevant country may obtain additional rights to the developed intellectual property, including the right to take title to any patents related to government funded inventions or to license the same to our competitors. Furthermore, our ability to exclusively license or assign the intellectual property developed under these government funding agreements to third parties may be limited or subject to the relevant government's approval or oversight. These limitations could have a significant impact on the commercial value of the developed intellectual property.

We often enter into research and development agreements with academic institutions whereby they generally retain certain rights to the developed intellectual property. The academic institutions generally retain rights over the technology for use in non-commercial academic and research fields, including in some cases the right to license the technology to third parties for use in those fields. It is difficult to monitor and enforce such non-commercial academic and research uses, and we cannot predict whether the third party licensees would comply with the use restrictions of these licenses. We could incur substantial expenses to enforce our rights against such licensees. In addition, even though the rights that academic institutions obtain are generally limited to the non-commercial academic and research fields, they may obtain rights to commercially exploit developed intellectual property in certain instances. Under research and development agreements with academic institutions, our rights to intellectual property developed thereunder are not always certain, but instead may be in the form of an option to obtain license rights to such intellectual property. If we fail to exercise our option rights in a timely way and / or we are unable to negotiate a license agreement, the academic institution may offer a license to the developed intellectual property to third parties for commercial purposes. Any such commercial exploitation could adversely affect our competitive position and have a material adverse effect on our business.

If third parties claim that intellectual property used by us infringes upon their intellectual property, our operating profits could be adversely affected.

We may, from time to time, be notified of claims that we are infringing upon patents, copyrights, or other intellectual property rights owned by third parties, and we cannot provide assurances that other companies will not in the future pursue such infringement claims against us or any third party proprietary technologies we have licensed. If we were found to infringe upon a patent or other intellectual property right, or if we failed to obtain or renew a license under a patent or other intellectual property right from a third party, or if a third party from whom we are licensing technologies was found to infringe upon a patent or other intellectual property rights of another third party, we may be required to pay damages, suspend the manufacture of certain products or re-engineer or rebrand our products, if feasible, or we may be unable to enter certain new product markets. Any such claims could also be expensive and time consuming to defend and could divert management's attention and resources. In addition, if we have omitted to enter into a valid non-disclosure or assignment agreement for any reason, we may not own the invention or our intellectual property and may not be adequately protected. Our competitive position could suffer as a result of any of these events and have a material adverse impact on our results of operations, financial position and cash flows.

Any failure of our research and development activity to improve our existing products and develop new products could cause us to lose market share.

Our products are highly technical in nature, and in order to maintain and improve our market position, we depend on successful research and development activity to continue to improve our existing products and develop new products. We cannot be certain that we will have sufficient research and development capability to respond to changes in the industries in which we operate. These changes could include changes in the technological environment in which we currently operate, increased demand for new products or the development of alternatives to our products. For example, the development of lighter weight steel alloys has

made the use of steel in gas cylinders a more competitive alternative to aluminum than it had been previously. In addition, our superformed aluminum components compete with new high-performance composite materials developed for use in the aerospace industry. In our efforts to develop and market new products and enhancements to our existing products, we may fail to identify new product opportunities or timely bring new products to market. We may also experience delays in completing development of, enhancements to or new versions of our products and product innovations may not achieve the market penetration or price stability necessary for profitability. In addition to benefiting from our research collaboration with universities, we spent \$5.7 million, \$6.4 million and \$7.8 million in 2019, 2018 and 2017 respectively, on our own research and development activities. We expect to fund our future research and development expenditure requirements through operating cash flows and restricted levels of indebtedness, but if operating profit decreases, we may not be able to invest in research and development or continue to develop new products or enhancements.

Without the timely introduction of new products or enhancements to existing products, our products could become obsolete over time, in which case our results of operations, financial position and cash flows could be adversely affected.

Some of our key operational equipment is relatively old and may require significant capital expenditures for repair or replacement.

We incur considerable expense on maintenance, including preventative maintenance and repairs. Higher levels of maintenance and repair costs could result from the need to maintain our older plants, property and equipment, and machinery breakdowns could result in interruptions to the business, causing lost production time and reduced output. Machinery breakdowns or equipment failures may hamper or cause delays in the production and delivery of products to our customers and increase our operating costs, thus reducing cash flows from operations. In particular, the breakdown of some of our older equipment, such as the large hot-rolling mill at our Madison, Illinois plant, could be difficult to repair and would be very costly should it need to be replaced. Any failure to deliver products to our customers in a timely manner could adversely affect our customer relationships and reputation. Any failure to implement required investments, due to the need to divert funds to repair existing physical infrastructure, service debt obligations, unanticipated liquidity constraints or other factors, could have a material adverse effect on our results of operations, financial position and cash flows.

Our operations may prove harmful to the environment resulting in reputational damage and clean-up or other related costs.

We are exposed to substantial environmental costs and liabilities, including liabilities associated with divested assets and prior activities performed on sites before we acquired an interest in them. Our operations, including the production and delivery of our products, are subject to a broad range of continually changing environmental laws and regulations in each of the jurisdictions in which we operate. These laws and regulations increasingly impose more stringent environmental protection standards on us with respect to, among other things, air emissions, wastewater discharges, the use and handling of hazardous materials, noise levels, waste disposal practices, soil and groundwater contamination and environmental clean-up. Complying with these regulations involves significant and recurring costs.

We cannot predict our future environmental liabilities and cannot assure investors that our management is aware of every fact or circumstance regarding potential liabilities, or that the amounts provided and budgeted to address such liabilities will be adequate for all purposes. In addition, future developments, such as changes in regulations, laws or environmental conditions, may result in reputational damage or increase environmental costs and liabilities that could have a material adverse effect on our results of operations, financial position and cash flows.

The health and safety of our employees and the safe operation of our business is subject to various health and safety regulations in each of the jurisdictions in which we operate. These regulations impose various obligations on us, including the provision of safe working environments and employee training on health and safety matters. Complying with these regulations involves recurring costs.

Certain of our operations are highly regulated by different agencies that require products to comply with their rules and procedures and can subject our operations to penalties or adversely affect production.

Certain of our operations are in highly regulated industries that require us to maintain regulatory approvals and, from time to time, obtain new regulatory approvals from various countries. This can involve substantial time and expense. In turn, higher costs of compliance reduce our cash flows from operations. For example, manufacturers of gas cylinders throughout the world must comply with high local safety and health standards and obtain regulatory approvals in the markets in which they sell their products. Furthermore, military organizations require us to comply with applicable government regulations and specifications when providing products or services to them directly or as subcontractors. In addition, we are required to comply with U.S. and other export regulations with respect to certain products and materials. The E.U. has also passed legislation governing the registration,

evaluation and authorization of chemicals, known as REACH, pursuant to which we are required to register chemicals and gain authorization for the use of certain substances. In the U.S. there is similar legislation under the Toxic Substance Control Act 1976 ("TSCA") which was substantially amended in 2016. Although we make reasonable efforts to obtain all licenses and certifications that are required by countries in which we operate, there is always a risk that we may be found not to comply with certain required procedures. This risk grows with increased complexity and variance in regulations across the globe. As regulatory schemes vary by country, we may also be subject to regulations of which we are not presently aware and could be subject to sanctions by a foreign government that could materially and adversely affect our operations in the relevant country.

Governments and their agencies have considerable discretion to determine whether regulations have been satisfied. They may also revoke or limit existing licenses and certifications or change the laws and regulations to which we are subject at any time. If our operations fail to obtain, experience delays in obtaining or lose a needed certification or approval, we may not be able to sell our products to our customers, expand into new geographic markets or expand into new product lines. In addition, new or more stringent regulations, if imposed, could result in us incurring significant costs in connection with compliance. Non-compliance with these regulations could result in administrative, civil, financial, criminal or other sanctions against us, which could have negative consequences on our business and financial position. Furthermore, if we begin to operate in new countries, we may need to obtain new licenses, certifications and approvals.

Our customers are also often subject to similar regulations and risks. We therefore face the risk that our customers may have the demand for their products reduced as a result of regulatory matters that fall outside our direct control. This would in turn reduce demand for our products and have a negative financial impact on our operating results.

Any of these factors could have a material adverse impact on our results of operations, financial position and cash flows.

We are subject to legislation and regulations to reduce carbon dioxide and other greenhouse gas emissions.

Although we are working to improve our energy efficiency, our manufacturing processes and the manufacturing processes of many of our suppliers and customers are still energy-intensive and use or generate, directly or indirectly, greenhouse gases ("GHGs"). Political and scientific debates related to the effects of emissions of carbon dioxide and other greenhouse gases on the global climate are ongoing. In recent years, current regulatory programs impacting GHG emissions from large industrial plants and other sources include the E.U. Emissions Trading Scheme, the CRC Energy Efficiency Scheme in the U.K. and certain federal and state programs in the U.S., including GHG reporting and permitting rules issued by the U.S.E.P.A and the California Cap and Trade Program. Moreover, in December 2015, 195 countries participating in the United Nations Framework Convention on Climate Change, at its 21st Conference of the Parties meeting held in Paris, adopted a new global agreement on the reduction of climate change (the "Paris Agreement"). The Paris Agreement sets a goal of holding the increase in global average temperature to well below 2 degrees Celsius and pursuing efforts to limit the increase to 1.5 degrees Celsius, to be achieved by commitments by the participating countries to set emissions reduction targets, referred to as "nationally determined contributions." The Paris Agreement came into effect on November 4, 2016, after it was ratified the previous month, with implementation efforts beginning from 2018 with reassessment every five years. As it is implemented, the Paris Agreement is anticipated to result in more stringent requirements relating to greenhouse gas emissions. Due to the costs of compliance and the potential impact on our energy costs, these programs and additional future legislation and regulations aimed at reducing GHG emissions could have a material adverse effect on our results of operations, financial position and cash flows.

Due to the nature and use of the products that we manufacture, we may in the future face large liability claims.

We are subject to litigation in the ordinary course of our business, which could be costly to us and which may arise in the future. We are exposed to possible claims for personal injury, death or property damage, which could result from a failure of a product manufactured by us or of a product integrating one of our products. For example, improperly manufactured gas cylinders could explode at high pressure, which can cause substantial personal and property damage. This risk may be increased through the use of new technologies, materials and innovations. We also supply many components into aerospace applications in which the potential for significant liability exposures necessitates additional insurance costs.

Many factors beyond our control could lead to liability claims, including:

- the failure of a product manufactured by a third party that incorporated components manufactured by us;
- the reliability and skills of persons using our products or the products of our customers; and

- the use by customers of materials or products that we produced for applications for which the material or product was not designed.

If we cannot successfully defend ourselves against claims, we may incur substantial liabilities. Even successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for our products;
- reputational injury;
- initiation of investigation by regulators;
- costs to defend related litigation;
- diversion of management time and resources;
- compensatory damages and fines;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- loss of revenue;
- exhaustion of any available insurance and our capital resources; and
- a decline in our stock price.

We could be required to pay a material amount if a claim is made against us that is not covered by insurance or otherwise subject to indemnification or that exceeds the insurance coverage that we maintain. Moreover, we do not currently carry insurance to cover the expense of product recalls, and litigation involving significant product recalls or product liability could have a material adverse effect on our results of operations, financial position and cash flows.

Our businesses could suffer if we lose certain employees or cannot attract and retain qualified employees.

We rely upon a number of key executives and employees, particularly members of the Executive Leadership Team. If these and certain other employees ceased to work for us, we would lose valuable expertise and industry experience and could become less profitable. We do not carry key person insurance covering the loss of any of our executives or employees.

In addition, future operating results depend in part upon our ability to attract and retain qualified engineering and technical personnel. As a result of intense competition for talent in the market, we cannot ensure that we will be able to continue to attract and retain such personnel. While our key employees are generally subject to non-competition agreements for a limited period of time following the end of their employment, if we were to lose the services of key executives or employees, it could adversely impact our ability to maintain our technological position, and / or have a material adverse effect on our results of operations, financial position and cash flows.

We could suffer a material interruption in our operations as a result of unforeseen events or operating hazards.

Our production facilities are located in a number of different locations around the world. Any of our facilities could suffer an interruption in production, either at separate times or at the same time, because of various and unavoidable occurrences, such as severe weather events (for example, hurricanes and floods), earthquakes, casualty events (for example, explosions, fires or material equipment breakdowns), acts of terrorism, pandemic disease, labor disruptions or other events (for example, required maintenance shutdowns). For example, our operations in California are subject to risks related to earthquakes. Further disruption occurred during 2015 at our Riverside, California, facility when an electrical arc caused damage to electrical equipment which triggered a power outage at the facility. In addition, some of our products are highly flammable, and there is a risk of fire inherent in their production process. Such hazards could cause personal injury or death, serious damage to, or destruction of, property and equipment, suspension of operations, substantial damage to the environment and / or reputational harm. The risk is particularly high in the production of ultra-fine magnesium powders, which are highly flammable and explosive in certain situations. Similar disruptions in the operations of our suppliers and / or customers could materially affect our business and operations. Although we carry certain levels of business interruption insurance, the coverage on certain catastrophic events or natural disasters, a failure of energy supplies and certain other events, is limited, and it is possible that the occurrence of such events may have a significant adverse impact on our results of operations, financial position and cash flows.

We are exposed to risks related to cybersecurity threats and general information security incidents which may also expose us to liability under data protection laws including the GDPR.

In the conduct of our business, we increasingly collect, use, transmit and store data on information technology systems. This data includes confidential information belonging to us, our customers and other business partners, as well as personally identifiable information of individuals, including our employees. Like other global companies, we have experienced, and expect to continue to be subject to, cybersecurity threats and incidents, ranging from employee error or misuse to individual attempts to gain unauthorized access to information technology systems, to sophisticated and targeted measures known as advanced persistent threats, none of which have been material to the Group to date.

Although we devote significant resources to network security, data encryption and other measures to protect our information technology systems and data from unauthorized access or misuse, including those measures necessary to meet certain information security standards that may be required by our customers, there can be no assurance that these measures will be successful in preventing a cybersecurity or general information security incident. We also rely in part on the reliability of certain tested third parties' cybersecurity measures, including firewalls, virus solutions and backup solutions, and our business may be affected if these third-party resources are compromised.

Cybersecurity incidents may result in business disruption, the misappropriation, corruption or loss of confidential information (including personally identifiable information) and critical data (ours or that of third parties), reputational damage, litigation with third parties, regulatory fines, diminution in the value of our investment in research and development and data privacy issues and increased information security protection and remediation costs. As these cybersecurity threats, and government and regulatory oversight of associated risks continue to evolve, we may be required to expend additional resources to remediate, enhance or expand upon the cybersecurity protection and security measures we currently maintain. For example, we are subject to the European Union's General Data Protection Regulation ("GDPR"), which became enforceable from May 25, 2018 and is expected to continue to apply to the U.K. following its exit from the E.U on January 31, 2020. The GDPR introduced a number of new obligations for subject companies resulting in the need to continue dedicating financial resources and management time to GDPR compliance. Among other things, the GDPR places subject companies under obligations relating to the security of the personally identifiable information they process; while we have taken steps to ensure compliance with the GDPR, there can be no assurance that the measures we have taken will be successful in preventing an incident, including a cybersecurity incident or other data breach, which results in a breach of the GDPR. Fines for non-compliance with the GDPR may be levied by supervisory authorities in the European Union up to a maximum of €20,000,000 or 4% of the subject company's annual, group-wide turnover (whichever is higher). Individuals who have suffered damage as a result of a subject company's non-compliance with the GDPR also have the right to seek compensation from such a company.

Future cybersecurity breaches, general information security incidents, further increases in data protection costs or failure to comply with relevant legal obligations regarding protection of data could therefore have a material adverse effect on our results of operations, financial position and cash flows.

Employee strikes and other labor-related disruptions may adversely affect our operations.

Several of our production facilities depend on employees who are members of various trade union organizations. Strikes by, or labor disputes with, our employees may adversely affect our ability to conduct business.

We cannot assure you that there will not be any strike, lock-out or material labor dispute in the future. Work interruptions or stoppages could have a material adverse effect on our results of operations, financial position and cash flows.

We could incur future liability claims arising from previous businesses now closed or sold.

We have sold or closed a number of businesses over the years, but the products or services provided when the businesses were open and under our ownership could still result in potential liabilities which could have a material adverse effect on our operations, financial position and cash flows.

As a holding company, Luxfer Holdings PLC's main source of cash is distributions from our operating subsidiaries.

Our ultimate parent company, Luxfer Holdings PLC, conducts all of its operations through the subsidiaries of Luxfer Group. Accordingly, its main cash source is dividends from these subsidiaries. The ability of each subsidiary to make distributions depends on the funds that a subsidiary receives from its operations in excess of the funds necessary for its operations, obligations or other business plans. Since Luxfer Group subsidiaries are wholly-owned, claims of Luxfer Holdings PLC will generally rank junior to all other obligations of the subsidiaries. If Luxfer Group operating subsidiaries are unable to make distributions, Luxfer Group's growth may slow, unless we are able to obtain additional debt or equity financing. In the event of a subsidiary's liquidation, there may not be assets sufficient for us to recoup our investment in the subsidiary.

Our failure to perform under purchase or sale contracts could result in the payment of penalties to customers or suppliers, which could have a negative impact on our results of operations, financial position or cash flows.

A failure to perform under purchase or sale contracts could result in the payment of penalties to suppliers and / or customers, which could have a negative impact on our results of operations, financial position or cash flows. Certain contracts with suppliers could also obligate us to purchase a minimum product volume (clauses known as "take or pay") or contracts with customers may impose firm commitments for the delivery of certain quantities of products within certain time periods. The risk of incurring liability under a take or pay supply contract would increase during an economic crisis, which in turn would increase the likelihood of a sharp drop in demand for our products, which could have a material adverse effect on our results of operations, financial position and cash flows.

We could be adversely affected by violations of the U.K. Bribery Act, the U.S. Foreign Corrupt Practices Act and similar worldwide anti-bribery laws.

The U.K. Bribery Act, the U.S. Foreign Corrupt Practices Act and similar worldwide anti-bribery laws generally prohibit companies and their intermediaries from making or receiving improper payments to, or from, government officials or, third parties, for the purpose of obtaining or retaining business. Failing to prevent bribery is also an offense under the U.K. Bribery Act. Our policies mandate compliance with these laws. Despite our compliance program, we cannot assure you that our internal control policies and procedures will always protect us from reckless, negligent or improper acts committed by our employees or agents. The costs of violations of these laws or allegations of such violations could have a material adverse effect on our results of operations, financial position and cash flows.

We have a significant amount of indebtedness, which may adversely affect our cash flows and our ability to operate our business, remain in compliance with debt covenants, make payments on our indebtedness, pay dividends and respond to changes in our business or take certain actions.

As of December 31, 2019, we had \$75.0 million of indebtedness under our senior notes (the "Loan Notes") divided into tranches of \$25.0 million, \$25.0 million and \$25.0 million due 2021, 2023 and 2026, respectively. There was also a \$17.5 million balance on the revolving credit facility ("RCF") as of December 31, 2019.

Our indebtedness could have important consequences. For example, it could make it more difficult for us to satisfy obligations with respect to indebtedness, and any failure to comply with the obligations of any of our debt instruments, including financial and other restrictive covenants, could result in an event of default under agreements governing our indebtedness. Further, our indebtedness could require us to dedicate a substantial portion of available cash flows to pay principal and interest on our outstanding debt, which would reduce the funds available for working capital, capital expenditures, dividends, acquisitions and other general corporate purposes. Our indebtedness could also limit our ability to operate our business, including the ability to engage in strategic transactions or implement business strategies. Factors related to our indebtedness could materially and adversely affect our business and our results of operations. Furthermore, our interest expense could increase if interest rates rise, because certain portions of our debt facilities bear interest at floating rates. If we do not have sufficient cash flows to service our debt, we may be required to refinance all or part of our existing debt, sell assets, incur further indebtedness or sell securities, none of which we can guarantee we will be able to do.

In addition, the agreements that govern the terms of our indebtedness contain, and any future indebtedness would likely contain, a number of restrictive covenants imposing significant operating and financial restrictions on us, including restrictions that may limit our ability to engage in acts that may be in our long-term best interests, including:

- incurring or guaranteeing additional indebtedness;
- capital expenditures;
- paying dividends (including to fund cash interest payments at different entity levels) or making redemptions, repurchases or distributions with respect to ordinary shares or capital stock;
- creating or incurring certain security interests;
- making certain loans or investments;
- engaging in mergers, acquisitions, investment in joint ventures, amalgamations, asset sales and sale and leaseback transactions; and
- engaging in transactions with affiliates.

These restrictive covenants are subject to a number of qualifications and exceptions. The operating and financial restrictions and covenants in our existing debt agreements and any future financing agreements may adversely affect our ability to finance future operations or capital needs or to engage in other business activities.

We may be able to incur significant additional indebtedness in the future. Although the agreements governing our indebtedness contain restrictions on the incurrence of certain additional indebtedness, these restrictions are subject to a number of important qualifications and exceptions, and the indebtedness incurred in compliance with these restrictions could be substantial. If we incur new indebtedness, the related risks, including those described above, could intensify.

Any of these factors could have a material adverse impact on our results of operations, financial position and cash flows.

Risks Related to Our Shares

Certain factors beyond our control may affect the market price of our ordinary shares.

Certain factors, some of which are beyond our control, may have a material effect on the market price of our ordinary shares, including:

- fluctuations in our results of operations;
- negative publicity;
- changes in stock market analyst recommendations regarding our company, sectors in which we operate, the securities market generally and conditions in the financial markets;
- regulatory developments affecting our industry;
- announcements of studies and reports relating to our products or those of our competitors;
- changes in economic performance or market valuations of our competitors;
- actual or anticipated fluctuations in our quarterly results;
- conditions in industries in which we operate;
- announcements by us or our competitors of new products, acquisitions, strategic relations, joint ventures or capital commitments;
- additions to or departures of our key executives and employees;
- fluctuations of exchange rates;
- release of transfer restrictions on our outstanding ordinary shares; and
- sales or perceived sales of additional ordinary shares.

During recent years, securities markets in the U.S. and worldwide have experienced significant volatility in prices and trading volumes. This volatility could have a material effect on the market price of our ordinary shares, which could adversely impact our ability to access equity markets and have a material adverse impact on our results of operations, financial position and cash flows.

Our ability to pay regular dividends on our ordinary shares is subject to the discretion of our Board of Directors and will depend on many factors, including our results of operations, cash requirements, financial position, contractual restrictions, applicable laws and other factors, and may be limited by our structure and statutory restrictions and restrictions imposed by the Revolving Credit Facility and the Loan Notes, as well as any future debt facilities.

We may declare cash dividends on our ordinary shares as described in ITEM 8. However, the payment of future dividends will be at the discretion of our Board of Directors. Any recommendation by our Board to pay dividends will depend on many factors, including our results of operations, cash requirements, financial position, contractual restrictions, applicable laws and other factors, including availability of future debt facilities. Under English law, any payment of dividends would be subject to the Companies Act 2006 of England and Wales (the "Companies Act"), which requires, among other things, that we can only pay dividends on ordinary shares out of profits available for distribution determined in accordance with the Companies Act. Additionally, any change in the level of our dividends or the suspension of the payment thereof could adversely affect the market price of our ordinary shares.

We have identified a material weakness in our internal control over financial reporting which could, if not remediated, adversely affect our ability to report our financial condition and results of operations in a timely and accurate manner, which may adversely affect investor confidence in our company and, as a result, the value of our common stock.

Our management is responsible for establishing and maintaining adequate internal control over our financial reporting, as defined in Rule 13a-15(f) under the Exchange Act. In Item 9A, "Controls and Procedures" of this 2019 Annual Report on Form 10-K, management identified a material weakness in our internal control over financial reporting.

As a result of the material weakness, our management concluded that our internal control over financial reporting was not effective as of December 31, 2019. The assessment was based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission in 2013. We are actively engaged in remediation activities designed to address the material weakness, but our remediation efforts are not complete and are ongoing. If our remedial measures are insufficient to address the material weakness, or if additional material weaknesses or significant deficiencies in our internal control are discovered or occur in the future, it may materially adversely affect our ability to report our financial condition and results of operations in a timely and accurate manner. If we are unable to report our results in a timely and accurate manner, we may not be able to comply with the applicable covenants in our financing arrangements, and may be required to seek additional waivers or repay amounts under these financing arrangements earlier than anticipated, which could adversely impact our liquidity and financial condition. Although we continually review and evaluate internal control systems to allow management to report on the sufficiency of our internal controls, we cannot assure you that we will not discover additional weaknesses in our internal control over financial reporting. The next time we evaluate our internal control over financial reporting, if we identify one or more new material weaknesses or are unable to timely remediate our existing weakness, we may be unable to assert that our internal controls are effective. If we are unable to assert that our internal control over financial reporting is effective, or if our independent registered public accounting firm is unable to express an opinion on the effectiveness of our internal controls, we could lose investor confidence in the accuracy and completeness of our financial reports, which would have a material adverse effect on the price of our common stock and possibly impact our ability to obtain future financing on acceptable terms. We may also lose assets if we do not maintain adequate internal controls.

It may be difficult to effect service of U.S. process and enforce U.S. legal process against the directors of Luxfer.

Luxfer is a public limited company incorporated under the laws of England and Wales. A number of our directors and officers reside outside of the U.S., principally in the U.K. A substantial portion of our assets, and the assets of such persons, are located outside of the U.S. Therefore, it may not be possible to effect service of process within the U.S. upon Luxfer or these persons in order to enforce judgments of U.S. courts against Luxfer or these persons based on the civil liability provisions of the U.S. federal securities laws. There is doubt as to the enforceability in England and Wales, in original actions or in actions for enforcement of judgments of U.S. courts, of civil liabilities solely based on the U.S. federal securities laws.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Our principal office is located in owned premises in Manchester, United Kingdom, and our management office in the United States is located in leased premises in Milwaukee, Wisconsin. Our operations are conducted in facilities throughout the world. These facilities house manufacturing and distribution operations, as well as sales and distribution offices.

We carry out Elektron manufacturing operations at six plants in the United States and single plants in each of the United Kingdom and Canada.

We carry out Gas Cylinders manufacturing operations at three plants in the United States, three plants in the United Kingdom and single plants in each of Canada and China. In addition, Gas Cylinders also has a sales and distribution office in both Australia and Italy.

Our manufacturing plants comprise both owned and leased properties. We believe that our production facilities are suitable for their purpose and are adequate to support our businesses.

Division	Property / Plant	Principal products manufactured	Ownership	Approximate area (square feet)
Elektron				
	Manchester, England	Magnesium alloys / zirconium chemicals	Split Lease / Own	561,264
	Madison, IL	Magnesium sheet	Lease	803,795
	Tamaqua, PA	Magnesium powders	Own	64,304
	Lakehurst, NJ	Magnesium powders	Own	78,926
	Flemington, NJ	Zirconium chemicals	Own	65,000
	Hamilton, Canada	Magnesium powders	Lease	16,335
	Cincinnati, OH	Magnesium heating pads	Lease	150,000
	Saxonburg, PA	Magnesium powders	Own	68,000
Gas Cylinders				
	Nottingham, England	Aluminum cylinders	Lease	143,222
	Calgary, Canada	Composite cylinders	Lease	65,500
	Worcester, England	Aluminum panels	Lease	97,315
	Kidderminster, England	Aluminum panels	Lease	60,200
	Riverside, CA	Composite cylinders	Lease / Own	125,738
	Graham, NC	Aluminum cylinders	Own	121,509
	Riverside, CA	Aluminum panels	Lease	68,240
	Shanghai, China	Cylinders	Lease	15,383

Item 3. Legal Proceedings

While we are involved from time to time in claims and legal proceedings that result from, and are incidental to, the conduct of our business including business and commercial litigation, employee and product liability claims, there are no material pending legal proceedings to which the Company or any of its subsidiaries is a party, or of which any of their property is subject. It is possible, however, that an adverse resolution of an unexpectedly large number of such individual claims or proceedings could in the aggregate have a material adverse effect on results of operations for a particular year or quarter.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

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

Market Information

Our common stock is listed on the New York Stock Exchange and is traded under the symbol "LXFR." As of December 31, 2019 the company had 18 shareholders of record.

Dividends

During the years ended December 31, 2019, 2018 and 2017 the Company paid quarterly dividends of \$0.125 per ordinary share which equated to \$13.6 million, \$13.4 million and \$13.3 million in 2019, 2018 and 2017 respectively. A further dividend of \$3.4 million was declared and paid in the first quarter of 2020. The declaration and payment of any future dividends will be at the discretion of our Board of Directors and will depend upon our results of operations, cash requirements, financial position, contractual restrictions, restrictions imposed by our indebtedness, any future debt agreements or applicable laws and other factors that our Board of Directors may deem relevant. As with all dividends declared to date, we expect future dividends to be paid out of our earnings.

Any payment of dividends is also subject to the provisions of the U.K. Companies Act, according to which dividends may only be paid out of profits available for distribution determined by reference to financial statements prepared in accordance with the Companies Act and IFRS as adopted by the E.U., which differ in some respects from U.S. GAAP. In the event that dividends are paid in the future, holders of the ordinary shares will be entitled to receive payments in U.S. dollars in respect of dividends on the underlying ordinary shares in accordance with the deposit agreement. Furthermore, because we are a holding company, any dividend payments would depend on cash flows from our subsidiaries.

United Kingdom tax consequences for holders of common stock

The United Kingdom tax consequences discussed below do not reflect a complete analysis or listing of all the possible United Kingdom tax consequences that may be relevant to holders of our common stock. Furthermore, the statements below only apply to holders of our common stock who are resident for tax purposes outside of the United Kingdom.

Investors should consult their own tax advisers in respect of the tax consequences related to receipt, ownership, purchase or sale or other disposition of our common stock.

United Kingdom withholding tax

Under current law, the Company is not required to make any deduction or withholding for or on account of United Kingdom tax from dividends distributed on our common stock, irrespective of the tax residence or individual circumstances of the recipient shareholder.

United Kingdom income tax on dividends

A non-United Kingdom tax resident holder of our common stock will not be subject to United Kingdom income taxes on dividend income and similar distributions in respect of our shares, unless the shares are attributable to a permanent establishment or a fixed place of business maintained in the United Kingdom by such non-U.K. holder.

Stamp duty and stamp duty reserve tax ("SDRT")

While the ordinary shares are held within a depositary trust company ("DTC"), provided that DTC satisfies various conditions specified in U.K. legislation, electronic book-entry transfers of such shares should not be subject to U.K. stamp duty and agreements to transfer such shares should not be subject to U.K. stamp duty reserve tax ("SDRT"). The parties have obtained confirmation of this position by way of formal clearance by HMRC. Likewise, transfers of, or agreements to transfer, the ordinary shares from the DTC clearance service into another clearance service or into a depositary receipt system should not, provided that the other clearance service or depositary receipt system satisfies various conditions specified in U.K. legislation, be subject to U.K. stamp duty or SDRT.

In the event that the ordinary shares have left the DTC clearance service otherwise than into another clearance service or depositary receipt system, any subsequent transfer of, or agreement to transfer, such ordinary shares may, subject to any available exemption or relief, be subject to U.K. stamp duty or SDRT at a rate of 0.5% of the consideration for such transfer or agreement. Any such U.K. stamp duty or SDRT will generally be payable by the transferee and must be paid (and any relevant transfer document stamped by HMRC) before the transfer can be registered in the books of Luxfer Holdings PLC.

In the event that ordinary shares which have left the DTC clearance service otherwise than into another clearance service or depositary receipt system are subsequently transferred back into a clearance service or depositary receipt system, such transfer, or agreement to transfer, may, subject to any available exemption or relief, be subject to U.K. stamp duty or SDRT at a rate of 1.5% of the consideration for such transfer (or, where there is no such consideration, 1.5% of the value of such ordinary shares). In practice this liability for stamp duty or SDRT is in general borne by the person depositing the relevant shares in the clearance service or depositary receipt system.

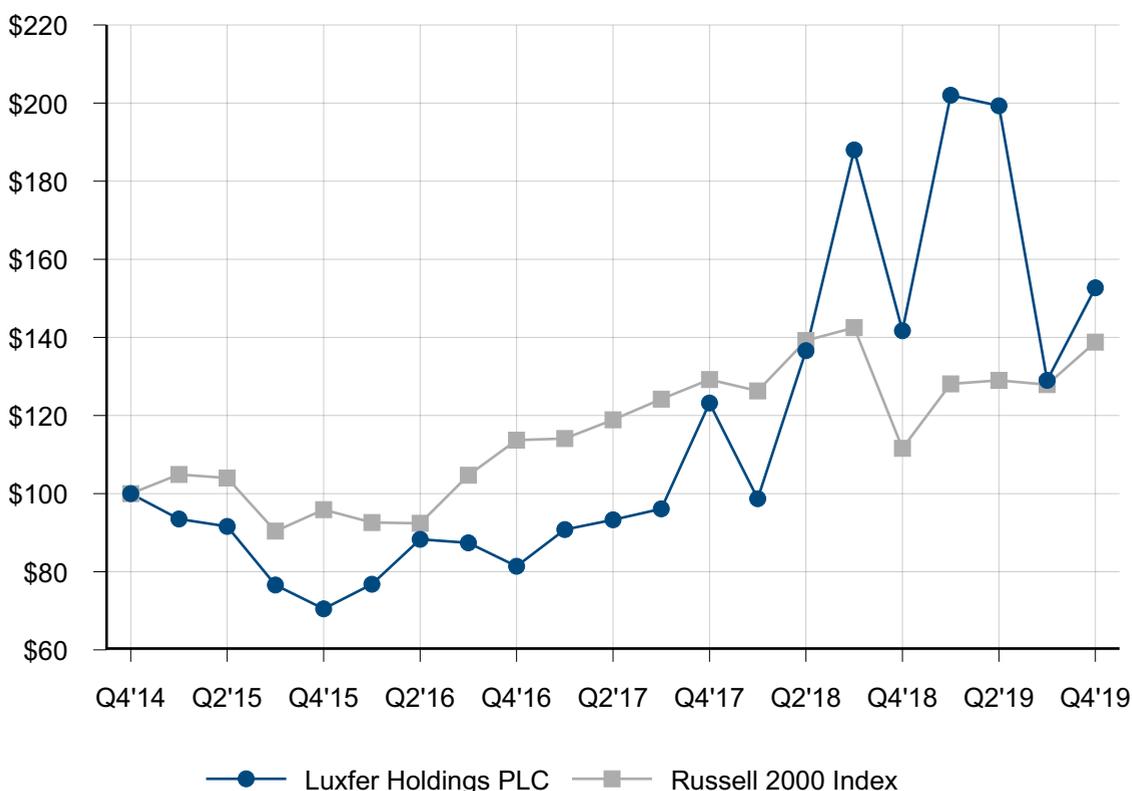
Share performance graph

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, 2014, and the reinvestment of all dividends since that date to December 31, 2019. The graph also contains for comparison purposes the Russell 2000 Index, assuming the same investment level and reinvestment of dividends.

By virtue of our market capitalization and characteristics, we believe the Russell 2000 Index is an appropriate published industry index for comparison purposes.

Comparison of Cumulative Five-Year Total Return



Purchase of Equity Securities

During the fourth quarter and entire fiscal year of 2019 we made no purchases of our ordinary shares.

Item 6. Selected Financial and Other Data

The below selected financial statements should be read in conjunction with the audited financial statements for the year ended December 31, 2019, included within ITEM 8 this document.

The results of operations for any period are not necessarily indicative of the results to be expected for any future period. The consolidated financial statements, from which the historical financial information for the periods set forth below have been derived, were prepared in accordance with U.S. generally accepted accounting principles ("GAAP"). The selected historical consolidated financial data set forth below should be read in conjunction with, and are qualified by reference to "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our audited consolidated financial statements and related notes thereto appearing elsewhere in this annual report on Form 10-K.

<i>In millions except share and per-share data</i>	Years ended December 31,				
	2019	2018	2017	2016	2015
Consolidated statements of operations and comprehensive income data					
Net sales	\$ 443.5	\$ 487.9	\$ 441.3	\$ 414.8	\$ 460.3
Operating income	12.4	30.0	21.9	32.9	15.0
Net income / (loss)	3.1	25.0	16.6	17.8	(0.4)
Per-share data					
Earnings / (loss) per ordinary share					
Basic	0.11	0.94	0.63	0.67	(0.01)
Diluted	0.11	0.90	0.62	0.67	(0.01)
Weighted average ordinary shares outstanding					
Basic	27,289,042	26,708,469	26,460,947	26,443,662	26,918,987
Diluted	27,882,864	27,692,262	26,723,981	26,654,638	27,328,190
Cash dividends declared and paid ¹	\$ 13.6	\$ 13.4	\$ 13.3	\$ 13.3	\$ 10.8
Cash dividends declared and paid after December 31 ¹	3.4	3.4	3.4	3.3	3.4
Consolidated balance sheets data					
Total assets	\$ 390.3	\$ 408.8	\$ 415.8	\$ 399.8	\$ 449.9
Total long-term obligations	141.9	133.3	157.3	196.2	197.2
Total shareholders' equity	174.4	184.3	174.5	150.4	183.8

¹In 2019, 2018, 2017 and 2016 the Company paid quarterly dividends of \$0.125 per ordinary share. In 2015 the Company paid quarterly dividends of \$0.10 per ordinary share.

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

Information regarding forward-looking statements

This Annual Report on Form 10-K contains certain statements, statistics and projections that are, or may be, forward-looking. These forward-looking statements are subject to known and unknown risks, uncertainties, assumptions and other factors that could cause our actual results of operations, financial condition, liquidity, performance, prospects, opportunities, achievements or industry results, as well as those of the markets we serve or intend to serve, to differ materially from those expressed in, or suggested by, these forward-looking statements. The accuracy and completeness of all such statements, including, without limitation, statements regarding our future financial position, strategy, plans and objectives for the management of future operations, is not warranted or guaranteed. These statements typically contain words such as "believes," "intends," "expects," "anticipates," "estimates," "may," "will," "should" and words of similar import. By their nature, forward-looking statements involve risk and uncertainty because they relate to events and depend on circumstances that will occur in the future. We undertake no obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise. Although we believe that the expectations reflected in such statements are reasonable, no assurance can be given that such expectations will prove to be correct. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied by such forward-looking statements. These factors include, but are not limited to, factors identified in "Business," "Risk factors," and "Management's Discussion and Analysis of Financial Condition and Results of Operations," or elsewhere in this Annual Report, as well as:

- general economic conditions, or conditions affecting demand for the services offered by us in the markets in which we operate, both domestically and internationally, being less favorable than expected;
- worldwide economic and business conditions and conditions in the industries in which we operate;
- fluctuations in the cost of raw materials and utilities;
- currency fluctuations and other financial risks;
- our ability to remediate the material weakness in our internal controls over financial reporting;
- our ability to protect our intellectual property;
- the significant amount of indebtedness we have incurred and may incur, and the obligations to service such indebtedness and to comply with the covenants contained therein;
- relationships with our customers and suppliers;
- increased competition from other companies in the industries in which we operate;
- changing technology;
- claims for personal injury, death or property damage arising from the use of products produced by us;
- the occurrence of accidents or other interruptions to our production processes;
- changes in our business strategy or development plans, and our expected level of capital expenditure;
- our ability to attract and retain qualified personnel;
- restrictions on the ability of Luxfer Holdings PLC to receive dividends or loans from certain of its subsidiaries;
- regulatory, environmental, legislative and judicial developments; and
- our intention to pay dividends.

Please read the sections "Business," "Risk factors," and "Management's Discussion and Analysis of Financial Condition and Results of Operations," of this Annual Report on Form 10-K for a more complete discussion of the factors that could affect our performance and the industries in which we operate, as well as those discussed in other documents we file or furnish with the SEC.

About Luxfer

Luxfer Holdings PLC ("Luxfer," "the Company," "we") is a global producer of highly-engineered industrial materials focused on sustained value creation using its broad array of technical knowhow and proprietary materials technologies. The Company specializes in the design and manufacture of high-performance products for transportation, defense and emergency response, healthcare, and general industrial purposes. Luxfer customers include both end-users of its products and manufacturers that incorporate Luxfer products into finished goods.

Key trends and uncertainties regarding our existing business

The following trends and uncertainties affected our financial performance in 2019, and will likely impact our results in the future:

- Full year results were behind expectations as sales fell 9%, led by a 62% decline in sales of our Solumag[®] product line used in fracking operations and a general slowdown observed in our industrial end-market. Sales were also negatively impacted by around 2% following the divestiture of our Czech magnesium recycling business in June.
- Given the industrial sales softness, we are accelerating our cost savings initiatives and increasing our growth focus on markets such as Defense.
- We also continued along our transformation journey realizing business restructuring initiatives aimed at further reducing our fixed cost structure while seeding revenue growth.

In 2020, our operating objectives and trends we expect to impact our business include the following:

- Productivity acceleration and growth recovery as we progress towards a lean manufacturing process and more focused and faster product innovation.
- Leveraging delivered plant consolidation projects in our Gas Cylinders and Graphic Arts businesses to further reduce fixed costs and safeguard competitiveness.
- Continued focus on developing global talent and implementing a high-performance culture.
- Improved operating cash generation with lower restructuring activity and stronger working capital performance.

CONSOLIDATED RESULTS OF OPERATIONS

The consolidated results of operations of Luxfer were as follows:

<i>In millions</i>	Years ended December 31,			% / point change	
	2019	2018	2017	2019 v 2018	2018 v 2017
Net sales	\$ 443.5	\$ 487.9	\$ 441.3	(9.1)%	10.6 %
Cost of goods sold	(335.5)	(365.8)	(332.7)	(8.3)%	9.9 %
Gross profit	108.0	122.1	108.6	(11.5)%	12.4 %
<i>% of net sales</i>	24.4%	25.0%	24.6%	(0.6)	0.4
Selling, general and administrative expenses	(55.1)	(60.8)	(68.1)	(9.4)%	(10.7)%
<i>% of net sales</i>	12.4%	12.5%	15.4%	(0.1)	(2.9)
Research and development	(5.7)	(6.4)	(7.8)	(10.9)%	(17.9)%
<i>% of net sales</i>	1.3%	1.3%	1.8%	—	(0.5)
Restructuring charges	(25.9)	(13.4)	(8.4)	93.3 %	59.5 %
<i>% of net sales</i>	5.8%	2.7%	1.9%	3.1	0.8
Impairment charges	(5.0)	(7.2)	(3.7)	(30.6)%	94.6 %
<i>% of net sales</i>	1.1%	1.5%	0.8%	(0.4)	0.7
Acquisition related (costs) / credits	(1.4)	(4.3)	1.3	(67.4)%	n/a
<i>% of net sales</i>	0.3%	0.9%	0.3%	(0.6)	0.6
Other charges	(2.5)	—	—	n/a	n/a
<i>% of net sales</i>	0.6%	—%	—%	n/a	n/a
Operating income	12.4	30.0	21.9	(58.7)%	37.0 %
<i>% of net sales</i>	2.8%	6.1%	5.0%	(3.3)	1.1
Net interest expense	(4.6)	(4.6)	(6.3)	— %	(27.0)%
<i>% of net sales</i>	1.0%	0.9%	1.4%	0.1	(0.5)
Defined benefit pension credit	1.3	4.7	4.2	(72.3)%	11.9 %
<i>% of net sales</i>	0.3%	1.0%	1.0%	(0.7)	—
Income before income taxes and equity in net income of affiliates	9.1	30.1	19.8	(69.8)%	52.0 %
<i>% of net sales</i>	2.1%	6.2%	4.5%	(4.1)	1.7
Provision for income taxes	(6.7)	(5.5)	(3.3)	21.8 %	66.7 %
<i>Effective tax rate</i>	73.6%	18.3%	16.7%	55.3	1.6
Income before equity in net income of affiliates	2.4	24.6	16.5	(90.2)%	49.1 %
<i>% of net sales</i>	0.5%	5.0%	3.7%	(4.5)	1.3
Equity in income of unconsolidated affiliates (net of tax)	0.7	0.4	0.1	75.0 %	300.0 %
<i>% of net sales</i>	0.2%	0.1%	—%	0.1	0.1
Net income	\$ 3.1	\$ 25.0	\$ 16.6	(87.6)%	50.6 %
<i>% of net sales</i>	0.7%	5.1%	3.8%	(4.4)	1.3

Net sales

The 9.1% decrease in consolidated net sales in 2019 from 2018 was primarily the result of:

- \$8.3 million revenue decline as a result of the divestiture of Elektron's magnesium Czech recycling business at the end of the second quarter. Excluding this divestiture, underlying business declined 7.1%;
- Significantly lower sales of our proprietary SoluMag[®] alloy as a result of continuing destocking amid budgetary pressures affecting North American shale producers;
- Reduction in sales in the Gas Cylinders segment affecting Superform for European luxury automobiles and lower margin aluminum gas cylinders;
- Adverse foreign currency effects of \$9.5 million.
- These decreases were partially offset by:
 - Continued recovery in sales of alternative fuel (AF) systems;
 - Increased revenues from zirconium-based automotive and industrial catalysis materials.

The 10.6% increase in consolidated net sales in 2018 from 2017 was primarily the result of:

- Continued growth of our proprietary SoluMag[®] alloy;
- Recovery in sales of alternative fuel (AF) systems and SCBA cylinders;
- Improvements in sales in our Superform business; and
- Increased revenues from zirconium-based automotive and industrial catalysis materials.

Gross profit

The 0.6 percentage point decrease in gross profit as a percentage of sales in 2019 from 2018 was primarily the result of:

- Adverse sales mix;
- Unfavorable foreign exchange variances; and
- Impact of short-term process inefficiency following plant consolidation exercises.

These decreases were partially offset by cost savings resulting from our continued effort to reduce production-based costs, partially derived from our transformation plan.

The 0.4 percentage point increase in gross profit as a percentage of sales in 2018 from 2017 was primarily the result of:

- Continued cost savings derived from our transformation plan; and
- Favorable sales mix.

These increases were partially offset by:

- Inflationary increases related to raw materials and labor costs; and
- Increased distribution costs.

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

SG&A costs as a percentage of sales have decreased marginally by 0.1 percentage points in 2019 from 2018. The \$5.7 million or 9.4% decline in costs was primarily the result of continued cost savings derived from our transformation plan, as well as lower management incentive awards in 2019. This was partially offset by \$1.5 million of non-recurring litigation expense incurred in 2019.

The 2.9 percentage point decrease in SG&A costs as a percentage of sales in 2018 from 2017 was primarily the result of continued cost savings derived from our transformation plan.

Research and development costs

Research and development costs as a percentage of sales remained flat at 1.3% in both 2019 and 2018.

The 0.5 percentage point decrease in research and development costs as a percentage of sales in 2018 from 2017 was primarily the result of development projects being canceled to focus on those which we believe have more economic benefit to the Company.

Restructuring charges

The \$25.9 million restructuring charges in 2019 includes:

- \$20.1 million in relation to the closure of Luxfer Gas Cylinders France;
- \$4.6 million related to asset write-downs and one-time employee benefits following the decision to scale down production at one of our Luxfer Magtech sites; and
- \$1.2 million of other simplification costs.

The \$13.4 million restructuring charges in 2018 was the result of:

- \$10.0 million within the Gas Cylinders segment in relation to plant consolidation costs, including one-time employee benefits, asset write-downs and associated legal and professional fees mainly in relation to the closure of Luxfer Gas Cylinders France;
- \$2.0 million of termination costs and a property impairment charge related to the rationalization of Elektron's Graphic Arts operations; and
- \$1.4 million related to a previously announced plant closure affecting Elektron's Magtech business unit.

Impairment charges

The impairment charge of \$5.0 million in 2019 primarily relates to a \$5.2 million impairment of the property, plant and equipment of Superform, in the Gas Cylinders segment following a downturn affecting European luxury automotive sales. This is partially offset by a \$0.2 million true-up of the 2018 impairment of the assets of the Czech magnesium recycling business prior to its eventual divestiture in Q2, 2019.

Impairment charges of \$7.2 million in 2018 related primarily to a \$1.3 million impairment of goodwill associated with our Superform business unit and \$2.4 million in write-downs related to the step-up acquisition of our Luxfer Holdings, NA LLC joint venture, both held within the Gas Cylinders Segment. An additional \$3.4 million impairment within our Elektron segment resulting from the transfer of our Czech business' assets and liabilities to held-for-sale.

Acquisition-related costs

Acquisition-related costs of \$1.4 million in 2019 related to:

- \$3.5 million reimbursement payment and \$0.9 million of professional and legal fees incurred in connection with the terminated acquisition of Neo Performance Materials; offset by
- \$2.9 million gain on disposal of Elektron's magnesium recycling business in the Czech Republic; and
- \$0.1 million credit in relation to the revaluation of deferred contingent consideration, arising from the acquisition of the legacy businesses of Luxfer Magtech Inc. which was acquired in 2014.

Acquisition-related costs of \$4.3 million in 2018 related to :

- \$3.7 million related to professional and legal fees in connection with the aborted acquisition of Neo Performance Materials; and
- \$0.6 million was in relation to the revaluation of deferred contingent consideration, arising from the acquisition of the legacy businesses of Luxfer Magtech Inc.

Other charges

The \$2.5 million other charges incurred in 2019, is the result of the Company's decision to commence a project to remove low-level naturally occurring radioactive material (NORM) from a redundant building at Elektron's

Manchester, UK site. The work represents remediation of a legacy environmental issue and is expected to complete in the second quarter of 2020, but with no significant further costs envisioned.

Net interest expense

Net interest expense of \$4.6 million in 2019 was flat compared to 2018.

A reduction in the average debt balance in 2018 relative to 2017 resulted in lower interest costs due to:

- Repayment of \$15.0 million loan when due, June 2018; and
- A nil balance on the revolving credit facility at the year-end following net repayment of \$21.3 million during the year.

Defined benefit pension credit

The credit of \$1.3 million represents a 72.3% decrease in 2019 from 2018. This was primarily due to:

- Lower projected asset returns; and
- Loss of \$0.8 million resulting from a settlement affecting the U.S. plan in the final quarter of 2019.

The 11.9% increase in defined benefit pension credit in 2018 from 2017 was primarily due to:

- Updated mortality assumptions in the U.K. and U.S., which lead to lower life expectancies; and
- Weakening of GBP sterling against the U.S. dollar. Partially offset by:
- Increase in long-term U.K inflation expectations; and
- Asset returns being lower than assumed.

Provision for income taxes

The 55.3 percentage point increase in the effective tax rate in 2019 from 2018 was primarily due to significant non-deductible expenses incurred in relation to the closure of Luxfer Gas Cylinders France and the terminated acquisition of Neo Performance Materials.

The 1.6 percentage point increase in the effective tax rate in 2018 from 2017 was primarily due to:

- Deferred tax credit in 2017 reflecting the impact of U.S. tax reform, partially offset by:
- Deferred tax credit in 2018 in relation to U.K. 'patent box' allowances.

RECONCILIATION OF NON-GAAP FINANCIAL MEASURES TO GAAP MEASURES

The following table of non-GAAP summary financial data presents a reconciliation of net income to adjusted net income for the periods presented, being the most comparable GAAP measure. Management believes that adjusted net income, adjusted earnings per share, adjusted EBITA and adjusted EBITDA are key performance indicators (KPIs) used by the investment community and that such presentation will enhance an investor's understanding of the Company's operational results. In addition, Luxfer's CEO and other senior management use these KPIs, among others, to evaluate business performance. However, investors should not consider adjusted net income and adjusted earnings per share in isolation as an alternative to net income and earnings per share when evaluating Luxfer's operating performance or measuring Luxfer's profitability.

<i>In millions except per share data</i>	Years ended December 31,		
	2019	2018	2017
Net income	3.1	25.0	16.6
Accounting charges / (credits) relating to acquisitions and disposals of businesses:			
Unwind of discount on deferred consideration	0.2	0.2	0.2
Amortization on acquired intangibles	1.2	1.2	1.3
Acquisitions and disposals	1.4	4.3	(1.3)
Defined benefit pension credit	(1.3)	(4.7)	(4.2)
Restructuring charges	25.9	13.4	8.4
Impairment charges	5.0	7.2	3.7
Other charges	2.5	—	5.8 ⁽¹⁾
Share-based compensation charges	4.5	4.8	2.2
Impact of U.S. tax reform	—	—	(2.0)
Other non-recurring tax items	—	(2.9)	—
Income tax on adjusted items	(2.7)	(1.7)	(3.1)
Adjusted net income	39.8	46.8	27.6
Adjusted earnings per ordinary share			
Diluted earnings per ordinary share	0.11	0.90	0.62
Impact of adjusted items	1.32	0.79	0.41
Adjusted diluted earnings per ordinary share ⁽²⁾	1.43	1.69	1.03

⁽¹⁾ Other charges in 2017 include costs incurred on: settlement and other legal expenses incurred in relation to patent infringement litigation against a competitor; and costs incurred in relation to the conversion of the Company's ADR listing to a direct listing of ordinary shares on the New York Stock Exchange, disclosed within selling, general and administrative expenses.

⁽²⁾ For the purpose of calculating diluted earnings per share, the weighted average number of ordinary shares outstanding during the financial year has been adjusted for the dilutive effects of all potential ordinary shares and share options granted to employees.

<i>In millions except per share data</i>	Years ended December 31,		
	2019	2018	2017
Adjusted net income	39.8	46.8	27.6
Add back / (deduct):			
Impact of U.S. tax reform	—	—	2.0
Other non-recurring tax items	—	2.9	—
Income tax on adjusted items	2.7	1.7	3.1
Income tax expense	6.7	5.5	3.3
Net finance costs	4.6	4.6	6.3
Adjusted EBITA	53.8	61.5	42.3
Loss on disposal of PPE	0.2	0.3	—
Depreciation	14.1	17.8	17.0
Adjusted EBITDA	68.1	79.6	59.3

SEGMENT RESULTS OF OPERATIONS

The summary that follows provides a discussion of the results of operations of each of our two reportable segments (Gas Cylinders and Elektron). Both segments comprise various product offerings that serve multiple end markets.

Adjusted EBITDA represents operating income adjusted for restructuring charges; impairment charges; cost to remove NORM materials from a redundant building; legal expenses incurred from patent litigation with a competitor; profit on sale of redundant site; direct listing costs; acquisition-related charges / credits; loss on disposal of property, plant and equipment; depreciation and amortization; share based compensation expense; and unwind of discount on deferred consideration. A reconciliation to net income and taxes can be found in ITEM 8, note 16.

GAS CYLINDERS

The net sales and adjusted EBITDA for Gas Cylinders were as follows:

<i>In millions</i>	Years ended December 31,			% / point change	
	2019	2018	2017	2019 v 2018	2018 v 2017
Net sales	\$ 223.6	\$ 238.1	\$ 220.2	(6.1)%	8.1%
Adjusted EBITDA	23.3	23.4	17.0	(0.4)%	37.6%
<i>% of net sales</i>	10.4%	9.8%	7.7%	0.6	2.1

Net sales

The 6.1% decrease in Gas Cylinders sales in 2019 from 2018 was primarily the result of:

- Lower sales of aluminum cylinders used in industrial applications;
- Decreased demand in Superform for European luxury automobiles; and
- Adverse foreign currency effects of \$5.0 million.
- These are partially offset by continued strength in alternative fuel cylinder sales.

The 8.1% increase in Gas Cylinders sales in 2018 from 2017 was primarily the result of:

- Increased sales of AF cylinders;
- Increased sales of SCBA cylinders;
- Increased Superform tooling and formed component sales.

Adjusted EBITDA

The 0.6 percentage point increase in adjusted EBITDA for Gas Cylinders as a percentage of net sales in 2019 from 2018 was primarily the result of:

- Favorable cost reduction initiatives in the cylinders business; and
- Improved product mix driven by higher sales of composite cylinders over aluminum, especially AF;

These increases were partially offset by:

- Adverse foreign currency effects in the cylinders business.

The 2.1 percentage point increase in adjusted EBITDA for Gas Cylinders as a percentage of net sales in 2018 from 2017 was primarily the result of:

- Improved product mix driven by higher sales of SCBA cylinders;
- Improved margin on AF cylinder sales;
- A one-time bad debt expense affecting an overseas customer in 2017.
- These increases were partially offset by lower Superform gross margin on both tooling and component sales.

ELEKTRON

The net sales and adjusted EBITDA for Elektron were as follows:

<i>In millions</i>	Years ended December 31,			% / point change	
	2019	2018	2017	2019 v 2018	2018 v 2017
Net sales	\$ 219.9	\$ 249.8	\$ 221.1	(12.0)%	13.0%
Adjusted EBITDA	44.8	56.2	42.3	(20.3)%	32.9%
<i>% of net sales</i>	20.4%	22.5%	19.1%	(2.1)	3.4

Net sales

The 12.0% decrease in Elektron sales in 2019 from 2018 was primarily the result of:

- \$8.3 million revenue decline as a result of the divestiture of Elektron's magnesium Czech recycling business at the end of Q2, with underlying business excluding the divestiture declining 7.1%;
- Significantly lower sales of our proprietary SoluMag[®] alloy;
- Lower sales of other industrial products; and
- Adverse foreign currency effects of \$4.5 million.

This was partially offset by increased revenues from zirconium-based automotive and industrial catalysis materials.

The 13.0% increase in Elektron sales in 2018 from 2017 was primarily the result of:

- Continued growth in sales of our proprietary SoluMag[®] alloy;
- Increased sales of zirconium-based automotive and industrial catalysts;
- Increased sales of high-performance magnesium alloys used primarily in aerospace, and wrought magnesium alloy used in the manufacture of performance automotive wheels;
- Increased shipments of magnesium-based defense and disaster-relief products.

Adjusted EBITDA

The 2.1 percentage point decrease in adjusted EBITDA for Elektron as a percentage of net sales in 2019 from 2018 was primarily the result of:

- Adverse mix, predominantly the impact of lower SoluMag[®] sales;
- Impact of short term inefficiency following plant consolidation and a flood affecting Graphic Arts;

These decreases were partially offset by the favorable impact of cost saving initiatives.

The 3.4 percentage point increase in adjusted EBITDA for Elektron as a percentage of net sales in 2018 from 2017 was primarily the result of:

- Improved product mix, driven primarily by growth of SoluMag[®];
- Reduction in operational costs as part of our transformation plan;

These increases were partially offset by:

- Reduced pricing on certain product lines to drive volume;
- Higher distribution costs linked to growth of SoluMag[®].

LIQUIDITY AND CAPITAL RESOURCES

Our liquidity requirements arise primarily from obligations under our indebtedness, capital expenditures, acquisitions, the funding of working capital and the funding of hedging facilities to manage foreign exchange and commodity purchase price risks. We meet these requirements primarily through cash flows from operating activities, cash deposits and borrowings under the Revolving Credit Facility and accompanying ancillary hedging facilities and the Loan Notes due, 2021, 2023 and 2026. Our principal liquidity needs are:

- funding acquisitions, including deferred contingent consideration payments;
- capital expenditure requirements;
- payment of shareholder dividends;
- servicing interest on the Loan Notes, which is payable at each quarter end, in addition to interest and / or commitment fees on the Senior Facilities Agreement;
- working capital requirements, particularly in the short term as we aim to achieve organic sales growth; and
- hedging facilities used to manage our foreign exchange and aluminum purchase price risks.

We believe that, in the long term, cash generated from our operations will be adequate to meet our anticipated requirements for working capital, capital expenditures and interest payments on our indebtedness. In the short term, we believe we have sufficient credit facilities to cover any variation in our cash flow generation. However, any major repayments of indebtedness will be dependent on our ability to raise alternative financing or to realize substantial returns from operational sales. Also, our ability to expand operations through sales development and capital expenditures could be constrained by the availability of liquidity, which, in turn, could impact the profitability of our operations.

We have been in compliance with the covenants under the Loan Notes and the Senior Facilities Agreement throughout all of the quarterly measurement dates from and including September 30, 2011, to December 31, 2019.

Luxfer conducts all of its operations through its subsidiaries, joint ventures and affiliates. Accordingly, Luxfer's main cash source is dividends from its subsidiaries. The ability of each subsidiary to make distributions depends on the funds that a subsidiary receives from its operations in excess of the funds necessary for its operations, obligations or other business plans. We have not historically experienced any material impediment to these distributions, and we do not expect any local legal or regulatory regimes to have any impact on our ability to meet our liquidity requirements in the future. In addition, since our subsidiaries are wholly-owned, our claims will generally rank junior to all other obligations of the subsidiaries. If our operating subsidiaries are unable to make distributions, our growth may slow, unless we are able to obtain additional debt or equity financing. In the event of a subsidiary's liquidation, there may not be assets sufficient for us to recoup our investment in the subsidiary.

Our ability to maintain or increase the generation of cash from our operations in the future will depend significantly on the competitiveness of and demand for our products, including our success in launching new products. Achieving such success is a key objective of our business strategy. Due to commercial, competitive and external economic factors, however, we cannot guarantee that we will generate sufficient cash flows from operations or that future working capital will be available in an amount sufficient to enable us to service our indebtedness or make necessary capital expenditures.

Cash Flows

Operating activities

Cash provided by operating activities was \$5.8 million in 2019 which includes approximately \$20 million of cash spent on restructuring activities. It was primarily related to net income from operating activities, net of the following non-cash items: depreciation and amortization; asset impairment charges, pension contributions and net changes to assets and liabilities.

Cash provided by operating activities was \$63.2 million in 2018. It was primarily related to net income from operating activities, net of the following non-cash items: depreciation and amortization; asset impairment charges, pension contributions and net changes to assets and liabilities.

Investing activities

Net cash used for investing activities was \$8.3 million in 2019, compared to net cash used for investing activities of \$10.0 million in 2018. The following investing activities impacted our cash flow:

Capital expenditures

Capital expenditures in 2019 and 2018 were \$13.9 million in each year. We anticipate capital expenditures for 2020 to be around \$15 million.

Proceeds from sale of business

In June 2019, the Company sold its Czech recycling business, for net cash proceeds of \$4.4 million.

Acquisitions

During 2018, we completed the acquisition of 100% of Luxfer Holdings NA LLC, a previously 49%-owned joint venture, in exchange for the forgiveness of the joint venture partner's share on a loan from Luxfer Holdings PLC, (51% of \$4.0 million). Cash balances held by the acquired entity resulted in net cash inflow of \$2.7 million recorded in investing activities.

Financing activities

In 2019, net cash used for financing activities was \$1.0 million (2018: \$51.9 million). We made net drawdowns on our banking facilities of \$14.0 million (2018: net repayments of \$37.0 million) and dividend payments of \$13.6 million (2018: \$13.4 million), equating to \$0.125 per ordinary share.

Loan Notes due 2018, 2023 and 2026

On May 13, 2011, our subsidiary, BA Holdings, Inc., entered into a note purchase agreement (the "Note Purchase Agreement") among us, our subsidiaries and the note purchasers, to issue \$65 million aggregate principal amount of senior notes due 2018 in a U.S. private placement to an insurance company and related parties (the "Loan Notes due 2018"). The Loan Notes due 2018 bore interest at a rate of 6.19% per annum, and were due to mature on June 15, 2018.

On June 29, 2016, Luxfer agreed with the lender under the Loan Notes due 2018 to extend the maturity date of \$50 million of the outstanding \$65 million principal amount. The transaction was facilitated through the utilization of the Shelf Facility. The extension also includes a lower long-term fixed interest rate on the debt. The maturity date on \$25 million was extended from June 2018 to June 2023 (the "Loan Notes due 2023") at a fixed interest rate of 4.88%; and the maturity date on \$25 million was extended to June 2026 (the "Loan Notes due 2026") at a fixed interest rate of 4.94%. The revised loan documents also relaxed a number of provisions and covenants, including the removal of various restrictions on distributions, including dividends.

On June 14, 2018, our subsidiary, BA Holdings, Inc., repaid \$15.0 million for the Loan Notes due 2018. This was facilitated through drawing down on the Senior Facilities Agreement.

The Note Purchase Agreement contains customary covenants and events of default, in each case with customary and appropriate grace periods and thresholds. In addition, the Note Purchase Agreement requires us to maintain compliance with a minimum interest coverage ratio and a leverage ratio. The interest coverage ratio measures our EBITDA (as defined in the Note Purchase Agreement) to Net Finance Charges (as defined in the Note Purchase Agreement). We are required to maintain an interest coverage ratio of 4.0:1. The leverage ratio measures our Total Net Debt (as defined in the Note Purchase Agreement) to Adjusted Acquisition EBITDA (as defined in the Note Purchase Agreement). We are required to maintain a leverage ratio of no more than 3.0:1. We have been in compliance with the covenants under the Note Purchase Agreement throughout all of the quarterly measurement dates from and including September 30, 2011, to December 31, 2019.

The Loan Notes due 2018, 2023 and 2026 and the Note Purchase Agreement are governed by the law of the State of New York.

The Loan Notes due 2018, 2023 and 2026 are denominated in U.S. dollars, which creates a natural partial offset between the dollar-denominated net assets and earnings of our U.S. operations and the dollar-denominated debt and related interest expense of the notes. We have included the Note Purchase Agreement and a form of the Loan Notes due 2018, 2023 and 2026 as exhibits to this Annual Report and refer you to the exhibits for more information on the Note Purchase Agreement and the Loan Notes due 2018, 2023 and 2026.

Loan Notes due 2021 and Shelf Facility

On September 18, 2014, we entered into a note purchase and shelf facility agreement (the "Note Purchase and Private Shelf Agreement") among us, our subsidiaries and the note purchasers, to issue \$25 million aggregate principal amount of senior notes due 2021 in a U.S. private placement to an insurance company and related parties (the "Loan Notes due 2021"). This arrangement also allows for a further \$50 million of borrowing through an uncommitted three-year shelf facility with the insurance company (the "Shelf Facility"). The Loan Notes due 2021 bear interest at a rate of 3.67% per annum, payable quarterly, and continuing until the principal amount of the Loan Notes 2021 has become due and payable. The Loan Notes due 2021 mature on September 15, 2021.

The Note Purchase and Private Shelf Agreement contains the same customary covenants and events of default as for the Note Purchase Agreement. The Note Purchase and Private Shelf Agreement also requires us to maintain compliance with the same, interest and leverage ratios as for the Note Purchase Agreement. Amounts drawn under the Shelf Facility in June 2016 were used to facilitate an extension of the maturity of \$50 million of the outstanding principal amount of the Loan Notes due 2018.

We have been in compliance with the covenants under the Note Purchase and Private Shelf Agreement throughout all of the quarterly measurement dates from and including September 30, 2014, to December 31, 2019.

The Loan Notes due 2021 and Shelf Facility and the Note Purchase and Private Shelf Agreement are governed by the law of the State of New York.

Senior Facilities Agreement

Overview. On May 13, 2011, we entered into the Senior Facilities Agreement with Lloyds TSB Bank plc, Clydesdale Bank PLC and Bank of America, N.A. Lloyds TSB Bank plc and Clydesdale Bank PLC were Mandated Lead Arrangers under the Senior Facilities Agreement. This agreement has been subject to a series of amendments. The most significant of these amendments were dated March 25, 2014, when two new banks, Santander U.K. plc and National Westminster Bank plc (a subsidiary of The Royal Bank of Scotland plc), joined the banking syndicate and July 31, 2017, when two banks left the banking syndicate, Santander U.K. plc and Bank of America, N.A., and were replaced by two new banks, Citibank, N.A and HSBC Bank plc.

The following is a summary of the terms of the Senior Facilities Agreement, as amended, that we believe are the most important. We have included the Senior Facilities Agreement as an exhibit to this Annual Report and refer you to the exhibit for more information on the Senior Facilities Agreement.

Structure. The current Senior Facilities Agreement provides \$150 million of committed debt facilities, in the form of a multi-currency (GBP sterling, U.S. dollars or euros) Revolving Credit Facility and an additional \$50 million of uncommitted facilities through an accordion clause. The amended facilities mature July 31, 2022. As of December 31, 2019, we had drawn down \$17.5 million under the Revolving Credit Facility (December 31, 2018: \$nil).

Availability. The facility is used for loans and overdrafts. Amounts unutilized under the Revolving Credit Facility (or, if the case, under the revolving portion of the Accordion) are allocated to ancillary facilities available under the Senior Facilities Agreement in connection with overdraft facilities, bilateral loan facilities and letter of credit facilities. As of December 31, 2019, we had drawn down \$nil under the ancillary facilities (December 31, 2018: \$nil). We may use amounts drawn under the Revolving Credit Facility for our general corporate purposes and certain capital expenditures, as well as for the financing of permitted acquisitions and reorganizations. As of December 31, 2019, \$132.5 million (net of \$17.5 million drawn down) was available under the Revolving Credit Facility. The last day we may draw funds from the Revolving Credit Facility is June 30, 2022.

The Company has a separate bonding facility for bank guarantees and documentary letters of credit denominated in GBP sterling of £5.5 million (\$7.2 million), of which £1.5 million (\$2.3 million) was drawn as of December 31, 2019. At December 31, 2018, the bonding facility was for £10.0 million (\$12.8 million) of which £1.2 million (\$1.5 million) was drawn.

Interest rates and fees. Borrowings under the facility bear an interest rate equal to an applicable margin plus either EURIBOR, in the case of amounts drawn in euros, or LIBOR, in the case of amounts drawn in GBP sterling or U.S. dollars.

The applicable base margin for the Revolving Credit Facility is subject to adjustment each quarter end based on our leverage ratio, which is defined in the Senior Facilities Agreement as the ratio of the Total Net Debt to Adjusted Acquisition EBITDA (each as defined in the Senior Facilities Agreement) in respect of the rolling 12-month period ending on the last day of the relevant quarter.

The tables below sets out the range of ratios and the related margin percentage currently in effect.

Leverage	Margin (% per annum)
Greater than 3.0:1	2.90
Less than or equal to 3.0:1, but greater than 2.5:1	2.50
Less than or equal to 2.5:1, but greater than 2.0:1	2.25
Less than or equal to 2.0:1, but greater than 1.5:1	2.00
Less than or equal to 1.5:1, but greater than 1.0:1	1.75
Less than or equal to 1.0:1	1.50

As of December 31, 2019, we had drawn down \$17.5 million under the Revolving Credit Facility (December 31, 2018: \$nil). A commitment fee is levied each quarter against any unutilized element of the Revolving Credit Facility, excluding overdraft or ancillary facilities. This was calculated at 40% of the applicable margin in force before the July 2017 amendment, following which it is now calculated at 35% of the applicable margin in force. During 2019, this fee percentage ranged between 0.5 and 0.6%.

Guarantees and security. The renegotiated Senior Facilities Agreement, agreed in November 2012, removed all U.K. and U.S. security debentures from the agreement together with the cancellation of all share pledges, with no change to this in the March 2014 and July 2017 amendments.

Repayment of principal. Any amounts borrowed under the Revolving Credit Facility must be paid at the end of an interest period agreed between the borrower (and Luxfer Holdings PLC acting on its behalf) and the agent when the loan is made.

Change of control. In the event of a sale of all or substantially all of our business and / or assets or if any person or group of persons acting in concert gains direct or indirect control (as defined in the Senior Facilities Agreement) of Luxfer Holdings PLC, we will be required to immediately repay all outstanding amounts under the Revolving Credit Facility (and, if the case, the Accordion) and the ancillary facilities under the Senior Facilities Agreement.

Certain covenants and undertakings. The Senior Facilities Agreement contains a number of additional undertakings and covenants that, among other things, restrict, subject to certain exceptions, us and our subsidiaries' ability to:

- engage in mergers, demergers, consolidations or deconstructions;
- change the nature of our business;
- make certain acquisitions;
- participate in certain joint ventures;
- grant liens or other security interests on our assets;
- sell, lease, transfer or otherwise dispose of assets, including receivables;
- enter into certain non-arm's-length transactions;
- grant guarantees;
- pay off certain existing indebtedness;
- make investments, loans or grant credit;
- repurchase our shares;
- issue shares or other securities; and
- redeem, repurchase, decrease, retire or repay any of our share capital.

We are permitted to dispose of assets up to \$25 million in aggregate until July 2022, without restriction as to the use of the proceeds under the Senior Facilities Agreement. Above this level, we would need to seek agreement from the majority of the lenders under the Senior Facilities Agreement. In addition, we may pay dividends, subject to certain limitations.

In addition, the Senior Facilities Agreement requires us to maintain compliance with an interest coverage ratio and a leverage ratio. The interest coverage ratio measures our EBITDA (as defined in the Senior Facilities Agreement) to Net Finance Charges (as defined in the Senior Facilities Agreement). We are required to maintain a minimum interest coverage ratio of 4.0:1. The leverage ratio measures our Total Net Debt (as defined in the Senior Facilities Agreement) to the Relevant Period Adjusted Acquisition EBITDA (as defined in the Senior Facilities Agreement). We are required to maintain a leverage ratio of no more than 3.0:1.

Any breach of a covenant in the Senior Facilities Agreement could result in a default under the Senior Facilities Agreement, in which case lenders could elect to declare all borrowed amounts immediately due and payable if the default is not remedied or waived within any applicable grace periods. Additionally, our and our subsidiaries' ability to make investments, incur liens and make certain restricted payments is also tied to ratios based on EBITDA.

We have been in compliance with the covenants under the Senior Facilities Agreement throughout all of the quarterly measurement dates from and including September 30, 2011, to December 31, 2019.

Events of default. The Senior Facilities Agreement contains customary events of default, in each case with customary and appropriate grace periods and thresholds, including, but not limited to:

- non-payment of principal, interest or commitment fee;
- violation of covenants or undertakings;
- representations, warranties or written statements being untrue;
- cross default and cross acceleration;
- certain liquidation, insolvency, winding-up, attachment and bankruptcy events;
- certain litigation, arbitration, administrative or environmental claims having a material adverse effect on us or any of our subsidiaries;
- qualification by the auditors of our consolidated financial statements which is materially adverse to the interests of the lenders;
- certain change of control events;
- cessation of business;
- material adverse change; and
- certain Employee Retirement Income Security Act 1974 ("ERISA") matters.

Upon the occurrence of an event of default under the Senior Facilities Agreement, the lenders will be able to terminate the commitments under the senior secured credit facilities, and declare all amounts, including accrued interest, to be due and payable and to take certain other actions.

The Senior Facilities Agreement is governed by English law.

Dividends

We paid dividends in 2019 of \$13.6 million (2018: \$13.4 million), or \$0.50 per ordinary share.

Any payment of dividends is also subject to the provisions of the U.K. Companies Act, according to which dividends may only be paid out of profits available for distribution determined by reference to financial statements prepared in accordance with the Companies Act and IFRS as adopted by the E.U., which differ in some respects from U.S. GAAP. In the event that dividends are paid in the future, holders of the ordinary shares will be entitled to receive payments in U.S. dollars in respect of dividends on the underlying ordinary shares in accordance with the deposit agreement. Furthermore, because we are a holding company, any dividend payments would depend on cash flows from our subsidiaries.

Authorized shares

Our authorized share capital consists of 40.0 million ordinary shares with a par value of £0.50 per share.

Contractual obligations

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

<i>In millions</i>	Payments Due by Period				
	Total	Less than 1 year	1 – 3 years	3 – 5 years	After 5 years
Contractual cash obligations					
Loan Notes due 2021	\$ 25.0	\$ —	\$ 25.0	\$ —	\$ —
Loan Notes due 2023	25.0	—	—	25.0	—
Loan Notes due 2026	25.0	—	—	—	25.0
Revolving Credit Facility	17.5	—	17.5	—	—
Deferred contingent consideration	0.5	0.5	—	—	—
Obligations under operating leases	22.0	3.9	5.4	2.8	9.9
Capital commitments	1.0	1.0	—	—	—
Interest payments	14.0	3.4	5.6	3.1	1.9
Total contractual cash obligations	\$ 130.0	\$ 8.8	\$ 53.5	\$ 30.9	\$ 36.8

Off-balance sheet measures

At December 31, 2019, we had no off-balance sheet arrangements.

COMMITMENTS AND CONTINGENCIES

Capital commitments

At December 31, 2019, the Company had capital expenditure commitments of \$1.0 million (2018: \$2.5 million and 2017: \$0.6 million) for the acquisition of new plant and equipment.

Committed banking facilities

At December 31, 2019, the Company had committed banking facilities of \$150.0 million. The facilities were for providing loans, with a separate facility for letters of credit which at December 31, 2019, was £1.0 million (\$1.3 million). Of the committed facilities, \$17.5 million was drawn, no loans were drawn and no letters of credit were utilized. The Company also had two separate bonding facilities for bank guarantees, one denominated in GBP sterling of £4.5 million (\$5.9 million), of which £1.5 million (\$2.3 million) was utilized at December 31, 2019 and one denominated in USD of \$0.4 million which was fully utilized at December 31, 2019.

At December 31, 2018, the Company had committed banking facilities of \$150.0 million. The facilities were for providing loans and overdrafts, with a separate facility for letters of credit which at December 31, 2018, was £7.0 million (\$8.9 million). Of the committed facilities, no loans were drawn and no letters of credit were utilized. The Company also has a separate bonding facility for bank guarantees denominated in GBP sterling of £3.0 million (\$3.8 million), of which £1.5 million (\$2.3 million) was utilized at December 31, 2018 and one denominated in USD of \$0.4 million which was fully utilized at December 31, 2019.

Contingencies

In February 2014, a cylinder was sold to a long-term customer and ruptured at one of their gas facilities. As a result of this rupture, three people were noted to have minor injuries such as loss of hearing. There was no major damage to assets of the customer. A claim has been launched by the three people who were injured in the incident. We reviewed our quality control checks from around the time which the cylinder was produced and no instances of failures have been noted. It has also been noted by the investigator that the customer has poor quality and safety checks. As a result we do not believe that we are liable for the incident, and therefore, do not currently expect this case to have a material impact on the Company's financial position or results of operations.

NEW ACCOUNTING STANDARDS

See ITEM 8, Note 1 of the notes to the 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 of our 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. The impairment test is performed using a two-step process. In the first step, 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, 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. This non-recurring fair value measurement is a "Level 3" measurement under the fair value hierarchy described in ITEM 8 - Note 11.

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 three year long-term planning period. The three year growth rates for revenues and operating profits vary for each reporting unit being evaluated. Revenues and operating profit beyond 2022 are projected to grow at a perpetual growth rate of 2.3%.

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. We utilized discount rates ranging from 8.3% to 9.0% in determining the discounted cash flows in our fair value analysis.

We completed step one of our annual goodwill impairment evaluation as of the last day of the third quarter of 2019, 2018 and 2017 with each of our reporting units' fair value being substantially in excess of its carrying value apart from our Superform business unit within the Gas Cylinders segment. This resulted in an impairment in full of \$1.3 million, disclosed within impairment costs on the income statement in 2018.

Identifiable intangible assets

Our primary identifiable intangible assets include: customer relationships and technology and traded related assets. 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.

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 13 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. 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 rate

The discount rate used represents the annualized yield based on a cash flow matched methodology with reference to an AA corporate bond spot curve and having regard to the duration of the Plan's liabilities. This yield produced a weighted-average discount rate for our U.K. plans of 2.10% for 2019, 2.90% in 2018 and 2.40% in 2017. The discount rate on our U.S. plans was 3.10% in 2019, 4.20% in 2018 and 3.60% in 2017. There are no known or anticipated changes in our discount rate assumption that will impact our pension expense in 2020.

Expected rate of return

Our expected rate of return on plan assets for our U.K. plans was 4.10% for 2019, 4.90% in 2018 and 4.80% in 2017. The expected rate of return on our U.S. plans was 6.20% in 2019, 6.20% in 2018 and 6.00% in 2017. 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 forecast economic conditions, our asset allocations, input from external consultants and broader longer-term market indices.

See ITEM 8, Note 13 of the Notes to Consolidated Financial Statements for further information regarding pension and other post-retirement plans.

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

Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss and tax credit carry-forwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. When the Company does not believe that, on the basis of available information, it is more likely than not that deferred tax assets will be fully recovered, it recognizes a valuation allowance against its deferred tax assets to reduce the deferred tax assets to the amount more likely than not to be realized. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactments date.

Furthermore, a tax benefit from a tax position may be recognized in the financial statements only if it is more-likely-than-not that the position is sustainable, based solely on its technical merits and consideration of the relevant tax authority's widely understood administrative practices and precedents. The tax benefit recognized, when the likelihood of realization is more likely-than-not (i.e. greater than 50 percent), is measured at the largest amount that is greater than 50 percent likely of being realized upon settlement.

Item 7A. Quantitative and qualitative disclosures about market risk

Market risk is the potential economic loss arising from adverse changes in market rates and market prices such as interest rates, foreign currency exchange rates, commodity prices and changes in the market value of equity instruments. We are exposed to market risk, primarily related to foreign exchange, commodity prices and interest 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.

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.

To hedge foreign currency risks, we enter into short duration currency contracts. The below table details the foreign currency contracts which we have in place over sales and purchases. 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 Income ("AOCI") and subsequently recognized in the Consolidated Statements of Income and Comprehensive Statements of Income / (Loss) when the hedged item affects earnings.

December 31, 2019				
Sales hedges	U.S. dollars	Euros	Japanese Yen	
Contract totals/£m	0.1	7.6		
Maturity dates	01/20	01/20 to 03/20	01/20	
Exchange rates	1.2914	€1.1551 to €1.1750		142.86
December 31, 2018				
Purchase hedges	U.S. dollars	Euros	Canadian dollars	
Contract totals/£m	1.3	0.8	7.0	
Maturity dates	03/20	03/20	01/20	
Exchange rates	1.3228	1.1663	\$1.7137 to \$1.7664	
December 31, 2018				
Sales hedges	U.S. dollars		Euros	
Contract totals/£m	4.8		7.2	
Maturity dates	01/19 to 07/19		01/19 to 07/19	
Exchange rates	\$1.2519 to \$1.3419		€1.0949 to €1.1702	
Purchase hedges	U.S. dollars	Euros	Canadian dollars	Czech koruna
Contract totals/£m	7.5	1.7	2.9	0.1
Maturity dates	01/19 to 07/19	01/19 to 06/19	01/19 to 03/19	01/19
Exchange rates	\$1.2609 to \$1.3380	€1.1074 to €1.1221	\$1.7039 to \$1.7416	28.449

Commodity price risk

We are exposed to commodity price risks in relation to the purchases of our raw materials. Primary aluminum is a global commodity, with its principal trading market on the LME. In the normal course of business, we are exposed to aluminum price volatility to the extent that the costs of aluminum purchases are more closely related to the LME price than the sales prices of certain of our products. Our Gas Cylinders Segment will buy various aluminum alloys, in log, sheet, or tube form, and the contractual price will usually include an LME-linked base price plus a premium for a particular type of alloy and the cost of casting, rolling or extruding. The price of high-grade aluminum, which is actively traded on the LME, has fluctuated significantly in recent years. The price remains volatile and difficult to predict. Since aluminum is the Gas Cylinders Segment's largest single raw material cost, these fluctuations in the price of aluminum can affect this segment's and our financial results. In order to help mitigate this risk, we enter from time to time into LME-related transactions in the form of commodity contracts. Historically we have also ordered a certain amount of our aluminum billet purchases on a forward fixed price.

There is no similar financial market to hedge magnesium, zirconium raw materials or carbon fiber, and prices for these raw materials have been volatile in recent years with some increasing substantially. To help mitigate these risks, we have a number of fixed-price supply contracts for these raw materials, which limit our exposure to price volatility over a calendar year. However, we remain exposed over time to rising prices in these markets, and therefore rely on the ability to pass on any major price increases to our customers in order to maintain our levels of profitability for zirconium, and magnesium-based products. We have also in the last few years, when we felt it was appropriate, made additional physical purchases of magnesium and some rare earth chemicals to delay the impact of higher prices, but this has had a cash flow impact on occasion thereby leading to greater utilization of our revolving credit bank facilities.

Interest rate risk

As of December 31, 2019, we had both fixed rate and variable rate debt outstanding on our consolidated balance sheet. As a result of this exposure, we have in the past hedged interest payable under our floating rate indebtedness based on a combination of forward rate agreements, interest rate caps and swaps. There were no fixed or variable rate interest hedge agreements in place as of December 31, 2019, and December 31, 2018.

The Group has exposure to variable interest rates when it draws down on the revolving credit facilities. As a result of this exposure, the Group may decide to hedge interest payable based on a combination of forward rate agreements, interest rate caps and swaps. It has also used fixed rate debt within its financing structure to mitigate volatility in interest rate movements as disclosed in Notes 10 and 11 in the Notes to the Consolidated Financial Statements.

Total debt and debt funding to joint ventures and associates, at December 31, 2019, all related to fixed interest rate debt and so there was no interest rate risk at that date.

Item 8. Financial Statements and Supplementary Data

Luxfer Holdings PLC
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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Luxfer Holdings PLC

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Luxfer Holdings PLC and its subsidiaries (the "Company") as of December 31, 2019 and 2018, and the related consolidated statements of income, comprehensive income, changes in equity and cash flows for each of the three years in the period ended December 31, 2019, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company did not maintain, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO because a material weakness in internal control over financial reporting existed as of that date related to a combination of deficiencies in the Luxfer MEL Technologies business unit over certain information technology general controls for a new ERP system and over certain process-level controls, which arose as a consequence of the implementation of the new ERP system.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the annual or interim financial statements will not be prevented or detected on a timely basis. The material weakness referred to above is described in Management's Annual Report on Internal Control over Financial Reporting appearing under Item 9A. We considered this material weakness in determining the nature, timing, and extent of audit tests applied in our audit of the 2019 consolidated financial statements, and our opinion regarding the effectiveness of the Company's internal control over financial reporting does not affect our opinion on those consolidated financial statements.

Change in Accounting Principle

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

Basis for Opinions

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

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

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

Definition and Limitations of Internal Control over Financial Reporting

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

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

PricewaterhouseCoopers LLP (signed)
Manchester, United Kingdom
March 9, 2020

We have served as the Company's auditor since 2015.

LUXFER HOLDINGS PLC
CONSOLIDATED STATEMENTS OF INCOME

<i>In millions, except share and per-share data</i>	Years Ended December 31,		
	2019	2018	2017
Net sales	\$ 443.5	\$ 487.9	\$ 441.3
Cost of goods sold	(335.5)	(365.8)	(332.7)
Gross profit	108.0	122.1	108.6
Selling, general and administrative expenses	(55.1)	(60.8)	(68.1)
Research and development	(5.7)	(6.4)	(7.8)
Restructuring charges	(25.9)	(13.4)	(8.4)
Impairment charges	(5.0)	(7.2)	(3.7)
Acquisition related (costs) / credits	(1.4)	(4.3)	1.3
Other charges	(2.5)	—	—
Operating income	12.4	30.0	21.9
Interest expense	(4.7)	(5.0)	(6.6)
Interest income	0.1	0.4	0.3
Defined benefit pension credit	1.3	4.7	4.2
Income before income taxes and equity in net income of affiliates	9.1	30.1	19.8
Provision for income taxes	(6.7)	(5.5)	(3.3)
Income before equity in net income of affiliates	2.4	24.6	16.5
Equity in income of affiliates (net of tax)	0.7	0.4	0.1
Net income	\$ 3.1	\$ 25.0	\$ 16.6
Earnings per share			
Basic	\$ 0.11	\$ 0.94	\$ 0.63
Diluted	\$ 0.11	\$ 0.90	\$ 0.62
Weighted average ordinary shares outstanding			
Basic	27,289,042	26,708,469	26,460,947
Diluted	27,882,864	27,692,262	26,723,981

See accompanying notes to consolidated financial statements

LUXFER HOLDINGS PLC
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

<i>In millions</i>	Years Ended December 31,		
	2019	2018	2017
Net income	\$ 3.1	\$ 25.0	\$ 16.6
Other comprehensive (loss) / income			
Net change in foreign currency translation adjustment	0.6	(6.4)	11.9
Pension and post-retirement actuarial (losses) / gains, net of \$0.9, \$0.3 and \$0.6 tax, respectively	(3.9)	1.1	3.3
Cash flow hedges, net of \$0.1, \$0.0 and \$0.6 of tax, respectively	0.3	(0.6)	3.1
Other comprehensive (loss) / income, net of tax	(3.0)	(5.9)	18.3
Total comprehensive income	\$ 0.1	\$ 19.1	\$ 34.9

See accompanying notes to consolidated financial statements

LUXFER HOLDINGS PLC
CONSOLIDATED BALANCE SHEETS

<i>In millions, except share and per-share data</i>	December 31,	
	2019	2018
Current assets		
Cash and cash equivalents	\$ 10.2	\$ 13.8
Restricted cash	0.1	0.3
Accounts and other receivables, net of allowances of \$1.3 and \$2.4 respectively	66.3	62.7
Inventories	94.5	93.6
Other current assets	5.0	10.7
Total current assets	\$ 176.1	\$ 181.1
Non-current assets		
Property, plant and equipment, net	\$ 98.9	\$ 106.9
Right-of-use assets from operating leases	14.8	18.4
Goodwill	68.8	67.6
Intangibles, net	13.6	14.6
Deferred tax assets	15.8	18.6
Investments and loans to joint ventures and other affiliates	2.3	1.6
Total assets	\$ 390.3	\$ 408.8
Current liabilities		
Current maturities of long-term debt and short-term borrowings	\$ —	\$ 3.5
Accounts payable	36.4	36.9
Accrued liabilities	25.2	33.8
Taxes on income	0.1	1.6
Other current liabilities	12.3	15.4
Total current liabilities	\$ 74.0	\$ 91.2
Non-current liabilities		
Long-term debt	\$ 91.4	\$ 73.6
Pensions and other retirement benefits	35.2	40.0
Deferred tax liabilities	2.5	3.5
Other non-current liabilities	12.8	16.2
Total liabilities	\$ 215.9	\$ 224.5
Shareholders' equity		
Ordinary shares of £0.50 par value; authorized 40,000,000 shares for 2019 and 2018; issued and outstanding 29,000,000 shares for 2019 and 2018	\$ 26.6	\$ 26.6
Deferred shares of £0.0001 par value; authorized, issued and outstanding 761,835,338,444 shares for 2019 and authorized 761,845,318,444; issued and outstanding 761,835,338,444 shares for 2018	149.9	149.9
Additional paid-in capital	68.4	65.6
Treasury shares	(4.0)	(4.3)
Own shares held by ESOP	(1.7)	(2.2)
Retained earnings	84.8	95.3
Accumulated other comprehensive loss	(149.6)	(146.6)
Total shareholders' equity	\$ 174.4	\$ 184.3
Total liabilities and shareholders' equity	\$ 390.3	\$ 408.8

See accompanying notes to consolidated financial statements

LUXFER HOLDINGS PLC
CONSOLIDATED STATEMENTS OF CASH FLOWS

<i>In millions</i>	Years Ended December 31,		
	2019	2018	2017
Operating activities			
Net income	\$ 3.1	\$ 25.0	\$ 16.6
<i>Adjustments to reconcile net income to net cash provided by (used for) operating activities</i>			
Equity income of unconsolidated affiliates	(0.7)	(0.4)	(0.1)
Depreciation	14.1	17.8	17.0
Amortization of purchased intangible assets	1.2	1.2	1.3
Amortization of debt issuance costs	0.3	0.3	0.6
Share-based compensation charge	4.5	4.8	3.1
Deferred income taxes	3.2	0.2	(2.7)
Loss on disposal of property, plant and equipment	0.2	0.3	0.1
Gain on disposal of business	(2.9)	—	—
Asset impairment charges	10.0	13.9	5.9
Defined benefit pension credit	(2.8)	(4.0)	(3.4)
Defined benefit pension contributions	(7.9)	(7.9)	(8.4)
<i>Changes in assets and liabilities, net of effects of business acquisitions</i>			
Accounts and notes receivable	(2.7)	5.8	(11.5)
Inventories	0.3	(15.5)	4.9
Other current assets	(1.0)	1.1	1.3
Accounts payable	(0.8)	7.3	1.5
Accrued liabilities	(11.6)	4.8	13.5
Other current liabilities	(0.9)	9.9	(2.0)
Other non-current assets and liabilities	0.2	(1.4)	1.1
Net cash provided by operating activities	\$ 5.8	\$ 63.2	\$ 38.8
Investing activities			
Capital expenditures	\$ (13.9)	\$ (13.9)	\$ (10.5)
Proceeds from sale of property, plant and equipment	1.2	0.1	0.1
Proceeds from sale of businesses and other	4.4	—	0.1
Investments in unconsolidated affiliates	—	1.1	(1.0)
Acquisitions, net of cash acquired	—	2.7	(4.7)
Net cash used for investing activities	\$ (8.3)	\$ (10.0)	\$ (16.0)
Financing activities			
Net (repayments) / drawdowns of short term borrowings	\$ (3.5)	\$ (15.7)	\$ 4.2
Net drawdowns / (repayments) of long-term borrowings	17.5	(21.3)	(13.4)
Debt issuance costs	—	—	(0.6)
Deferred consideration paid	(0.5)	(0.8)	(1.4)
Proceeds from sale of shares	3.5	6.6	—
Dividends paid	(13.6)	(13.4)	(13.3)
Share based compensation cash paid	(4.4)	(7.3)	(0.6)
Net cash used for financing activities	\$ (1.0)	\$ (51.9)	\$ (25.1)
Effect of exchange rate changes on cash and cash equivalents	(0.3)	(0.5)	2.0
Net (decrease) / increase	\$ (3.8)	\$ 0.8	\$ (0.3)
Cash, cash equivalents and restricted cash; beginning of year	14.1	13.3	13.6
Cash, cash equivalents and restricted cash; end of year	10.3	14.1	13.3
Supplemental cash flow information:			
Interest payments	\$ 4.6	\$ 4.6	\$ 6.2
Income tax payments	6.1	2.9	4.1

See accompanying notes to consolidated financial statements

LUXFER HOLDINGS PLC
CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY

<i>In millions,</i>	Ordinary share capital	Deferred share capital	Additional paid-in capital	Treasury shares Number	Treasury shares Amount	Own shares held by ESOP Number	Own shares held by ESOP Amount	Retained earnings	Accumulated other comprehensive loss	Total equity
At January 1, 2017	\$ 25.3	\$ 150.9	\$ 60.0	(0.6)	\$ (7.1)	(0.1)	\$ (0.5)	\$ 80.8	\$ (159.0)	\$ 150.4
Net income	—	—	—	—	—	—	—	16.6	—	16.6
Other comprehensive loss, net of tax	—	—	—	—	—	—	—	—	18.3	18.3
Dividends declared and paid	—	—	—	—	—	—	—	(13.3)	—	(13.3)
Share based compensation	—	—	2.5	—	—	—	—	—	—	2.5
Common shares repurchased and classified as treasury shares	—	—	—	0.1	0.8	(0.1)	(0.8)	—	—	—
Purchase of shares from ESOP	—	—	(0.5)	—	0.5	—	—	—	—	—
Utilization of treasury shares to satisfy share based compensation	—	—	(0.4)	—	—	0.1	0.3	0.1	—	—
At December 31, 2017	\$ 25.3	\$ 150.9	\$ 62.1	(0.5)	\$ (5.8)	(0.1)	\$ (1.0)	\$ 83.7	\$ (140.7)	\$ 174.5
Net income	—	—	—	—	—	—	—	25.0	—	25.0
Issue of new shares	1.3	—	—	—	—	(1.9)	(1.3)	—	—	—
Cancellation of deferred shares	—	(1.0)	1.0	—	—	—	—	—	—	—
Shares sold from ESOP	—	—	6.2	—	—	0.5	0.4	—	—	6.6
Other comprehensive income, net of tax	—	—	—	—	—	—	—	—	(5.9)	(5.9)
Dividends declared and paid	—	—	—	—	—	—	—	(13.4)	—	(13.4)
Share based compensation	—	—	(2.5)	—	—	—	—	—	—	(2.5)
Purchase of shares into ESOP	—	—	—	0.1	1.4	(0.1)	(1.4)	—	—	—
Utilization of treasury shares to satisfy share based compensation	—	—	(0.1)	—	0.1	—	—	—	—	—
Utilization of shares from ESOP to satisfy share based compensation	—	—	(1.1)	—	—	—	1.1	—	—	—
At December 31, 2018	\$ 26.6	\$ 149.9	\$ 65.6	(0.4)	\$ (4.3)	(1.6)	\$ (2.2)	\$ 95.3	\$ (146.6)	\$ 184.3
Net income	—	—	—	—	—	—	—	3.1	—	3.1
Shares sold from ESOP	—	—	3.3	—	—	0.2	0.2	—	—	3.5
Other comprehensive loss, net of tax	—	—	—	—	—	—	—	—	(3.0)	(3.0)
Dividends declared and paid	—	—	—	—	—	—	—	(13.6)	—	(13.6)
Share based compensation	—	—	4.1	—	—	—	—	—	—	4.1
Utilization of treasury shares to satisfy share based compensation	—	—	(0.1)	—	0.3	—	—	—	—	0.2
Utilization of shares from ESOP to satisfy share based compensation	—	—	(4.5)	—	—	0.2	0.3	—	—	(4.2)
At December 31, 2019	\$ 26.6	\$ 149.9	\$ 68.4	(0.4)	\$ (4.0)	(1.2)	\$ (1.7)	\$ 84.8	\$ (149.6)	\$ 174.4

Ordinary share capital includes 29,000,000 shares in 2019, 29,000,000 shares in 2018 and 27,136,799 shares in 2017.

Deferred share capital includes 761,835,338,444 shares in 2019, 761,835,338,444 shares in 2018 and 769,413,708,000 shares in 2017.

See accompanying notes to consolidated financial statements

LUXFER HOLDINGS PLC

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. Summary of Significant Accounting Policies

Business description

Luxfer Holdings PLC is a global materials technology company specializing in the innovation and manufacture of high-performance materials, components and devices for transportation, defense and emergency response, healthcare and general industrial applications. It comprises two reportable segments being Gas Cylinders and Elektron.

Principles of consolidation

The consolidated financial statements comprise the financial statements of Luxfer Holdings PLC and its subsidiaries (collectively "we," "our," "Luxfer") that we control. Investments in unconsolidated affiliates, where we have the ability to exercise significant influence over the operating and financial policies, are accounted for using the equity method. All inter-company balances and transactions, including unrealized profits arising from intra-Company transactions, have been eliminated in full.

The consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America ("GAAP") and are presented in U.S. dollars ("USD"). The books of the Company's non-U.S. entities are converted to USD at each reporting period date in accordance with the accounting policy below. The functional currency of the holding company Luxfer Holdings PLC and its U.K. subsidiaries is pounds sterling (GBP), being the most appropriate currency for those particular operations.

Fiscal year

Our fiscal year ends on December 31. Beginning in the first quarter of 2018, we began reporting our interim quarterly periods on a 13-week basis ending on a Sunday. Prior to the first quarter of 2018 we reported 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, estimated losses on accounts receivable, estimated realizable value on excess and obsolete inventory, cost-to-cost revenue recognition, assets acquired and liabilities assumed in acquisitions, estimated selling proceeds from assets held for sale, contingent liabilities, measurement of contingent consideration, income taxes and pension benefits. Actual results could differ from our estimates.

Goodwill and other identifiable intangible assets

Business combinations are accounted for using the purchase method. The cost of an acquisition is measured as the aggregate of the consideration transferred, measured at acquisition date fair value, and the amount of any non-controlling interest in the acquiree. The measurement of non-controlling interest is at fair value and is determined on a transaction by transaction basis. Acquisition costs are expensed as incurred.

Goodwill is initially measured at cost, being the excess of the aggregate of the acquisition-date fair value of the consideration transferred and the amount recognized for the non-controlling interest over the net identifiable amounts of the assets acquired and the liabilities assumed in exchange for the business combination. After initial recognition, goodwill is measured at cost less any accumulated impairment losses. Goodwill is tested annually for impairment and is tested for impairment more frequently if events or changes in circumstances indicate that the asset might be impaired. The impairment test is performed using a two-step process. In the first step, 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, 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. For the purpose of impairment testing, goodwill acquired in a business combination is, from the acquisition date, allocated to the Company's reporting units that are expected to benefit from the combination.

1. Summary of Significant Accounting Policies (continued)

Goodwill and other identifiable intangible assets (continued)

Assumptions and judgments are required in calculating the fair value of the reporting units. 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 three year long-term planning period. The three year growth rates for revenues and operating profits vary for each reporting unit being evaluated. Revenues and operating profit beyond 2022 are projected to grow at a perpetual growth rate of 2.3%.

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. We utilized discount rates ranging from 8.3% to 9.0% in determining the discounted cash flows in our fair value analysis.

The fair value of the reporting units substantially exceeded the carrying value for all reporting units that have goodwill allocated.

A bargain purchase is measured at cost being the excess of the net identifiable amounts of the assets acquired and the liabilities assumed in exchange for the business combination over the aggregate of the acquisition-date fair value of the consideration transferred and the amount recognized for the non-controlling interest, if any. If after reassessing the fair values the conclusion remains that there has been a bargain purchase gain, then any amount of a bargain purchase is recognized immediately as income.

Contingent consideration arising as a result of a business combination is recognized at fair value at the acquisition date. Subsequent changes in the fair value of contingent consideration classified as an asset or liability are recorded as either a gain or a loss within acquisition related costs / credits in the consolidated statements of income.

Other intangible assets are measured initially at cost, or where acquired in a business combination at fair value, and are amortized on a straight-line basis over their estimated useful lives as shown in the table below.

Customer relationships	10 – 15 years
Technology and trading related	5 – 25 years

The carrying values are reviewed for impairment when events or changes in circumstances indicate that the carrying value may not be recoverable. Reviews are made annually of the estimated remaining lives and residual values of the patents and trademarks.

Variable interest entities

We have interests in certain joint venture entities that are variable interest entities ("VIEs"). Determining whether to consolidate a VIE may require judgment in assessing (i) whether an entity is a VIE and (ii) if we are the entity's primary beneficiary and thus required to consolidate the entity. To determine if we are the primary beneficiary of a VIE, we evaluate whether we have (i) the power to direct the activities that most significantly impact the VIE's economic performance and (ii) the obligation to absorb losses or the right to receive benefits of the VIE that could potentially be significant to the VIE. Our evaluation includes identification of significant activities and an assessment of our ability to direct those activities based on governance provisions and arrangements to provide or receive product and process technology, product supply, operations services, equity funding and financing and other applicable agreements and circumstances. Our assessment of whether we are a primary beneficiary of our VIEs requires the application of significant assumptions and judgment.

1. Summary of Significant Accounting Policies (continued)

Investments in affiliates

The company owns interests in the following affiliates:

Name of company	Country of incorporation	Holding	Proportion of voting rights and shares held	Classification	Consolidation method
Luxfer Uttam India Private Limited	India	Ordinary shares	51%	Joint venture (VIE)	Equity method
Nikkei-MEL Co. Limited	Japan	Ordinary shares	50%	Joint venture	Equity method
Sub161 Pty Limited	Australia	Ordinary shares	26.4%	Associate (VIE)	Equity method

We are not the primary beneficiary for any of the above noted VIEs, and therefore do not consolidate these and use the equity method to account for their results.

Property, plant and equipment, net

Property, plant and equipment is stated at historic cost less accumulated depreciation and any impairment in value. Depreciation is initially calculated on a straight-line basis over the estimated useful life of the particular asset. The depreciation expense during 2019, 2018 and 2017 was \$14.1 million, \$17.8 million and \$17.0 million, respectively. As a result of the complexity of our manufacturing process, there is a wide range of plant and equipment in operation. The estimated useful lives is summarized as follows:

Freehold buildings	10 - 33 years
Leasehold land and buildings	The lesser of life of lease or freehold rate
Machinery and equipment	3 - 25 years
Including:	
Heavy production equipment (including casting, rolling, extrusion and press equipment)	20 - 25 years
Chemical production plant and robotics	7 - 10 years
Other production machinery	5 - 10 years
Furniture, fittings, storage and equipment	3 - 10 years
Computer software	4 - 7 years

Freehold land is not depreciated.

Reviews are made annually of the estimated remaining lives and residual values of individual productive assets, taking account of commercial and technological obsolescence as well as normal wear and tear.

We review the carrying value for any individual asset for impairment when events or changes in circumstances indicate the carrying value may not be recoverable. If any such indication exists and where the carrying value exceeds the estimated recoverable amount, the asset is written-down to its estimated recoverable amount. 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. During 2019 we recorded an impairment of \$4.6 million (2018: \$6.6 million) in relation to restructuring activities. There was also a \$5.2 million charge, recorded within *impairment charges*, relating to plant and equipment held in our Superform business, following the downturn in the European luxury automotive market. In 2018 the \$3.4 million charge arose from the fair value adjustment in relation to the sale of the Czech business, recorded in *impairment charges*. In 2017 we recorded an impairment of \$1.5 million as part of an annual exercise to review the use of our long-lived assets.

1. Summary of Significant Accounting Policies (continued)

Impairments

The Company will recognize impairments in relation to property, plant and equipment, investments and goodwill, other identifiable intangible assets and other long-lived assets in accordance with the above policies. Impairments relating to restructuring activities, incurred to exit an activity or location, will be recorded within the restructuring line on the Statement of Income, other impairments will be recorded within impairment charges line on the Statement of Income.

The impairment line item in 2019 relates to: a \$5.2 million charge relating to plant and equipment held in our Superform business; partially offset by a true-up upon the final sale of the Czech business, \$0.2 million credit, (2018: \$3.4 million charge). In 2018 there was also a \$2.4 million write-off in relation to the acquisition of Luxfer Holdings NA LLC and \$1.3 million of goodwill impairment within the Superform business unit.

Revenue Recognition

A performance obligation is a promise in a contract to transfer a distinct good or service to the customer. The majority of the Company's 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. There is no variable consideration or obligations for returns, refunds, and no other related obligations in the Company's contracts.

Payment terms and conditions vary by contract type and may include a requirement of payment in advance. In instances where the timing of revenue recognition differs from the timing of invoicing, the Company has determined its contracts do not include a significant financing component.

The Company's revenue is primarily derived from the following sources and are recognized when or as the Company satisfies a performance obligation by transferring a good or service to a customer.

Product revenues

We recognize revenue when it is realized or realizable and has been earned. Revenue is recognized when persuasive evidence of an arrangement exists, shipment or delivery has occurred (depending on the terms of the sale), which is when the transfer of product or control occurs, our price to the buyer is fixed or determinable, and the ability to collect is reasonably assured.

Royalties

Royalty revenue is recognized on an accrual basis in accordance with the substance of the relevant agreements, provided that it is probable that the economic benefits will flow to the Company and the amount of revenue can be measured reliably.

Tooling revenue

Revenue from certain long-term tooling contracts is recognized over the contractual period under the cost-to-cost measure of progress as this is when the benefit is received by the customer. Incremental direct costs associated with the contract include, direct labor hours, direct raw material costs and other associated costs. Under this method, sales and gross profit are recognized as work is performed either 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. We record costs and earnings in excess of billings on uncompleted contracts within *Other current assets* and billings in excess of costs and earnings on uncompleted contracts within *Other current liabilities* in the Consolidated Balance Sheets. Where customer acceptance is on final completion and handover of the tool, revenue is recognized at the point the customer accepts ownership of the tool.

Practical Expedients

The Company has applied the transition practical expedient and does not disclose the amount of the transaction price allocated to the remaining performance obligations and an explanation of when the Company expects to recognize that amount as revenue for the fiscal year beginning January 1, 2016.

In addition, the Company applies the practical expedient and does not disclose information about remaining performance obligations for contracts that have original expected durations of one year or less.

1. Summary of Significant Accounting Policies (continued)

Cash, Cash Equivalents and Restricted Cash

We consider all highly liquid investments purchased with an original maturity of three months or less to be cash equivalents.

Restricted cash is recognized separately in the Consolidated Balance Sheets. Restricted cash balances were \$0.1 million at December 31, 2019 and \$0.3 million at December 31, 2018. The \$0.1 million in 2019 (2018: \$0.3 million) is held in escrow to disburse environmental liabilities recognized as a result of the acquisition of the Specialty Metals division of ESM Inc in 2017.

Inventories

Inventories are stated at the lower of cost or net realizable value. Raw materials are valued on a first-in, first-out basis. Strategic purchases of inventories in order to secure supply and reduce the impact of price volatility on the cost of inventories are valued on a weighted-average cost basis. Work in progress and finished goods costs comprise direct materials and, where applicable, direct labor costs, an apportionment of production overheads and any other costs that have been incurred in bringing the inventories to their present location and condition. Inventories are reviewed on a regular basis, and we will make allowance for excess or obsolete inventories and write-down to net realizable value based primarily on committed sales prices and our estimates of expected and future product demand and related pricing.

Research and Development

Included within research and development costs are directly attributable salaries, materials and consumables, as well as third-party contractor fees and research costs. These costs are expensed as incurred.

Foreign currencies

Transactions in currencies other than an operation's functional currency are initially recorded in the functional currency at the rate of exchange prevailing on the dates of transactions. At each balance sheet date, the foreign currency monetary assets and liabilities of each operation are translated into the functional currency of that operation at the rates prevailing on the balance sheet date.

All differences are taken to the consolidated statement of income / (loss), with the exception of differences on foreign currency borrowings that provide a hedge against a net investment in a foreign entity. These differences on foreign currency borrowings are taken directly to equity until the disposal of the net investment, at which time they are recognized in the consolidated statement of income / (loss). Tax charges and credits attributable to exchange differences on those borrowings are also included in equity.

On consolidation, the assets and liabilities of the Company's foreign operations are translated at exchange rates prevailing on the balance sheet date. Income and expense items are translated at the average exchange rates for the period. Exchange differences that arise, if any, are included in Accumulated other comprehensive income / (loss) ("AOCI"), a separate component of equity. Such translation differences are recognized in the consolidated statements of income / (loss) in the period in which the Company loses control of the operation or liquidation.

During 2019, the average USD/GBP sterling exchange rate was £0.7820 compared to the 2018 average of £0.7509. This change resulted in a negative impact of \$6.1 million on revenue and \$1.6 million on operating income. Based on the 2019 level of revenue and income, a weakening in GBP sterling leading to a £0.05 increase in the USD/GBP sterling exchange rate would result in a decrease of \$10.6 million in revenue and \$0.1 million in operating net income.

During 2019, the average USD/Euro exchange rate was €0.8943, compared to the 2018 average of €0.8472. This change resulted in a negative impact of \$0.2 million on revenue and \$0.6 million on operating profit. Based on the 2019 level of revenue and income, a weakening in the Euro leading to a €0.05 increase in the Euro to U.S. dollar exchange rate would result in a decrease of \$0.2 million in revenue and \$1.1 million change to operating profit.

1. Summary of Significant Accounting Policies (continued)

Income taxes

Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss and tax credit carry-forwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. When the Company does not believe that, on the basis of available information, it is more likely than not that deferred tax assets will be fully recovered, it recognizes a valuation allowance against its deferred tax assets to reduce the deferred tax assets to the amount more likely than not to be realized. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactments date.

Furthermore, a tax benefit from a tax position may be recognized in the financial statements only if it is more-likely-than-not that the position is sustainable, based solely on its technical merits and consideration of the relevant tax authority's widely understood administrative practices and precedents. The tax benefit recognized, when the likelihood of realization is more likely-than-not (i.e. greater than 50 percent), is measured at the largest amount that is greater than 50 percent likely of being realized upon settlement.

Employee benefit plans

The Company operates funded defined benefit pension plans in the U.K., the U.S. and France. The levels of funding are determined by periodic actuarial valuations that take into account changes in actuarial assumptions, including discount rates and expected returns on plan assets. The assets of the plans are generally held in separate trustee-administered funds. The Company also operates defined contribution plans in the U.K., the U.S., Australia and Canada.

Actuarial assumptions are updated annually and are disclosed in Note 13. 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.

Payments to defined contribution plans are charged as an expense as they fall due.

Commitments and contingencies

Loss contingencies are recognized when the Company has a present obligation as a result of a past event, it is probable that a transfer of resources will be required to settle the obligation, and a reliable estimate can be made of the amount of the obligation.

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, which is subjective and involves the application of significant estimates and assumptions, including the expected term of the award, implied volatility, expected dividend yield and the risk-free interest rate. Restricted share awards and units are recorded as compensation cost on an accelerated basis over the requisite service periods based on the market value on the date of the grant.

Performance share units ("PSU") 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 based upon the fair value of the awards on the grant date and the estimated vesting of the PSUs granted. The estimated vesting of the performance share units is based on the probability of achieving certain financial performance thresholds over the specified performance period.

1. Summary of Significant Accounting Policies (continued)

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 are exposed to credit risk in the event of nonpayment by customers. However we mitigate our exposure to credit risk by performing ongoing credit evaluations and, when deemed necessary, utilizing credit insurance, prepayments or guarantees. No individual customer represented more than 10% of our revenue or accounts receivable. The concentration of credit risks from financial instruments related to the markets we serve is not expected to have a material adverse effect on our consolidated financial position, cash flows or future results of operations.

Derivative financial instruments

We recognize all derivatives as either assets or liabilities (within accounts and other receivables, accounts payable, other non-current assets and other non-current liabilities) at fair value in our Consolidated Balance Sheets. If the derivative is designated and is effective as a cash-flow hedge, changes in the fair value of the derivative are recorded in AOCI as a separate component of equity in the Consolidated Statements of Changes in Equity and are recognized in cost of goods sold in the Consolidated Statements of Income / (loss) 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 in cost of goods sold. For a derivative that is not designated as or does not qualify as a hedge, changes in fair value are reported in income immediately, again in cost of goods sold. We use derivative instruments for the purpose of hedging commodity price risk and currency exposures, which exist as part of ongoing business operations.

New accounting standards

On January 1, 2019, we adopted ASC Topic 842, "Leases", and applied the modified retrospective approach to recognizing any right-of-use assets and lease liabilities. Upon adoption, we have recognized all of our leases greater than one-year in duration and greater than \$5,000 fair value, on the balance sheet as right-of-use assets and lease liabilities. This has resulted in us restating the prior period comparatives and have recognized a right-of-use asset of \$21.2 million at January 1, 2018, with a corresponding lease liability, split \$3.1 million, recognized in *Other current liabilities*, and \$18.1 million recognized in *Other non-current liabilities*. Classification as either operating or finance is based on criteria largely similar to those applied in ASC 840 but without explicit bright lines. We have made certain assumptions and judgments when applying ASC 842, those judgments of most significance are as follows:

- We elected the package of practical expedients available for transition which allow us to not reassess:
 - Whether expired or existing contracts contain leases under the new definition of a lease;
 - Lease classification for expired or existing leases; and
 - Whether previously capitalized initial direct costs would qualify for capitalization under ASC 842.
- We did not elect to use hindsight for transition when considering judgments and estimates such as assessments of lessee options to extend or terminate a lease or purchase the underlying asset.
- We did not elect to reassess whether land easements meet the definition of a lease if they were not accounted for as leases under the former rules.
- For all asset classes, we elected to not recognize a right-of-use asset and lease liability for leases with a term of 12 months or less.
- For all asset classes, we elected to not separate non-lease components from lease components to which they relate and have accounted for the combined lease and non-lease components as a single lease component.

1. Summary of Significant Accounting Policies (continued)

New accounting standards (continued)

We determine if an arrangement is a lease at inception. Operating leases are included in our Consolidated Balance Sheet as *Right-of-use assets from operating leases*, *Current operating lease liabilities* and *Non-current operating lease liabilities*. Some of our lease agreements contain renewal options; however, we do not recognize right-of-use assets or lease liabilities for renewal periods unless it is determined that we are reasonably certain of renewing the lease at inception or when a triggering event occurs. Some of our lease agreements contain rent escalation clauses (including index-based escalations), rent holidays, capital improvement funding or other lease concessions. We recognize our minimum rental expense on a straight-line basis based on the fixed components of a lease arrangement. We amortize this expense over the term of the lease beginning with the date of initial possession, which is the date we enter the leased space and begin to make improvements in preparation for its intended use.

In determining our right-of-use assets and lease liabilities, we apply a discount rate to the minimum lease payments within each lease agreement. ASC 842 requires us to use the rate of interest that a lessee would have to pay to borrow on a collateralized basis over a similar term an amount equal to the lease payments in a similar economic environment. When we cannot readily determine the discount rate implicit in the lease agreement, we utilize our incremental borrowing rate. To estimate our specific incremental borrowing rates over various tenures (ranging from one-year through 30-years), a comparable market yield curve consistent with our credit quality was calibrated to our publicly outstanding debt instruments.

The standard had no impact on our results of operations or cash flows. In addition, new disclosures are provided to enable users to assess the amount, timing and uncertainty of cash flows arising from leases.

Accounting standards which have been early adopted

Under U.S. GAAP, shares withheld by the company to pay the employees statutory minimum tax can still be classified as equity awards if all other criteria for such classification are met. Upon adoption of ASU 2016-09, an award containing a net settled tax withholding clause could be equity-classified so long as the arrangement limits tax withholding to the maximum individual statutory tax rate in a given jurisdiction. If tax withholding is permitted at some higher rate, then the whole award would be classified as a liability.

Accounting standards issued but not yet effective

In June 2016, the Financial Accounting Standards Board ("FASB") issued new accounting requirements regarding the measurement of credit losses on financial instruments, along with additional qualitative and quantitative disclosures. The new standard is effective for fiscal years beginning after December 15, 2019. The Company anticipates that the timing of the recognition of impairments to accounts, notes and other receivables will change rather than a material change in the size of the balance.

In August 2018, FASB issued new accounting requirements regarding the accounting for implementation costs in a cloud computing arrangement that is a service contract. The new standard is effective for fiscal years beginning after December 15, 2019. The Company does not anticipate there to be any material retrospective or prospective change in the costs that have been capitalized and expensed in regards to implementation projects.

In December 2019, FASB issued an amendment to simplify the accounting for income taxes. The new standard is effective for fiscal years beginning after December 15, 2020. The Company is assessing the impact of this new standard.

2. Acquisitions and disposals

Acquisition and disposal related costs of \$1.4 million have been incurred in 2019. This amount includes a \$3.5 million charge in relation to the reimbursement of costs and \$0.9 million of professional and legal fees incurred in connection with the terminated Neo acquisition, partially offset by a \$2.9 million gain from the sale of Magnesium Elektron CZ s.r.o in the second quarter of 2019 and a \$0.1 million credit on the remeasurement of the deferred contingent consideration.

The net gain on disposal of the Czech business is outlined below:

<i>In millions</i>	2019
Cash proceeds	5.9
Less:	
Cash held in business	(1.3)
Purchase price adjustment	(0.2)
Net proceeds	4.4
Net assets less cash	(3.6)
Gain on disposal	0.8
Disposal costs	(0.4)
Realized translation gain on disposal	2.5
Net gain on disposal	2.9

On December 28, 2018, Luxfer Holdings NA LLC (a 49% owned VIE joint venture) disposed of the assets and selected liabilities of Gas Transport Leasing LLC (its wholly-owned subsidiary) with the remaining 51% of Luxfer Holdings NA LLC simultaneously acquired by the Company. The disposal of the assets and selected liabilities to the JV partner was for consideration of \$2.2 million. The Company acquired the residual 51% of Luxfer Holdings NA LLC, in return for the forgiveness of the JV partner's share on a loan from Luxfer Holdings PLC, being \$2.1 million. The fair value of the net assets of Luxfer Holdings NA LLC at the acquisition date was assessed as \$4.0 million, valuing the residual 51% stake at \$2.1 million, resulting in no goodwill being recognized on the step acquisition.

The principal assets acquired include cash of \$2.7 million (including \$2.2 million from the sale of the leasing business), inventory (\$1.1 million), accounts and other receivables (\$0.8 million), property, plant and equipment (\$0.2 million), with accounts payable of \$0.8 million. There were no identified intangibles. As a consequence of the transaction we fully impaired our equity investment (from a pre-acquisition fair value of \$1.6 million) and partially impaired the loan to the equity investment; the combined effect resulting in a net charge of \$2.4 million being recognized in the consolidated statement of income, within impairment charges. At December 31, 2018, Luxfer Holdings NA LLC is 100% owned by the Company, is no longer considered a VIE and is a fully consolidated subsidiary. As the acquisition occurred very close to the year end date, no revenue or earnings are recorded in the consolidated statement of income for the reporting period.

On December 5, 2017, the Company acquired the trade and assets of the Specialty Metals business of ESM Group Inc., incorporating a manufacturing facility in Saxonburg, PA. The plant manufactures a range of magnesium-based chips, granules, ground powders and atomized powders. The acquired business was integrated with Luxfer's existing business that currently offers similar products under the Luxfer Magtech brand. On closing, an initial consideration of \$4.3 million was paid as well as an amount placed in general escrow of \$0.3 million as deferred consideration. An additional \$0.4 million, which has not been included as part of the purchase consideration, was placed in escrow for disbursement of environmental liabilities.

The fair value of net assets acquired was assessed as \$5.8 million, resulting in a gain on bargain purchase of \$1.2 million, which was recorded in the consolidated statements of income / (loss) within the *Acquisition related costs* line item. The principal assets acquired are land and buildings, \$2.0 million; plant and equipment, \$3.2 million; and inventory, \$0.7 million; with assumed liabilities of \$0.1 million. No separately identifiable intangibles were identified. The gain on bargain purchase resulted because the Specialty Metals business was not considered to be part of ESM Group's core business activities as it has adopted a strategy to focus on its steel industry customers. In implementing this strategy, ESM Group was eager to divest this non-core business, which was reflected in the transaction price. The Group believes that it can extract additional value from the site due to synergies with our existing Luxfer Magtech business.

In addition to the purchase consideration, \$0.5 million of acquisition-related costs were incurred and a \$0.4 million provision was set up for the disbursement of the environmental liabilities.

2. Acquisitions and disposals (continued)

Deferred contingent consideration

The deferred contingent consideration is in relation to the acquisition of Truetech and Innotech, (Luxfer Magtech) in 2015 and is linked to the future profitability of the entity. Where appropriate, this is payable annually from 2015 to 2020. The deferred contingent consideration totaled \$0.5 million at December 31, 2019 (2018: \$0.9 million), following a remeasurement of deferred contingent consideration at the year-end based upon the estimated future cash flows and the weighted probability of those cash flows being achieved, resulting in a credit to the consolidated income statement of \$0.1 million (2018: debit of \$0.9 million), net of an unwind of discount on deferred contingent consideration of \$0.2 million (2018: \$0.2 million). The entire consideration is deemed to be current and shown on the balance sheet within other current liabilities, as it is based on the performance of Luxfer Magtech for the year ending December 31, 2019. The potential undiscounted future payment has been estimated at \$0.5 million (2018: \$0.9 million). The maximum undiscounted amount payable under the sale agreement is \$10.0 million.

<i>In millions</i>	Years ended December 31,	
	2019	2018
Net cash flows on purchase of business:		
<i>Included in net cash flows from investing activities:</i>		
Cash acquired	—	2.7
Net cash flows on purchase of business	\$ —	\$ 2.7

<i>In millions</i>	Years ended December 31,	
	2019	2018
Net cash flows on purchase of business:		
<i>Included in net cash flows from financing activities:</i>		
Deferred consideration paid	\$ (0.5)	\$ (0.8)
Net cash flows on purchase of business	\$ (0.5)	\$ (0.8)

3. Earnings per share

Basic earnings per share are computed by dividing net income for the period by the weighted-average number of ordinary shares outstanding, net of Treasury shares and shares held in ESOP. Diluted earnings per share are computed by dividing net income for the period by the weighted average number of ordinary shares outstanding and the dilutive ordinary shares equivalents.

Basic and diluted earnings per share were calculated as follows:

<i>In millions except share and per-share data</i>	Years ended December 31,		
	2019	2018	2017
Basic earnings:			
Net income	\$ 3.1	\$ 25.0	\$ 16.6
Weighted average number of £0.50 ordinary shares:			
For basic earnings per share	27,289,042	26,708,469	26,460,947
Dilutive effect of potential common stock	593,822	983,793	263,034
For diluted earnings per share	27,882,864	27,692,262	26,723,981
Earnings per share using weighted average number of ordinary shares outstanding:			
Basic earnings per ordinary share	\$ 0.11	\$ 0.94	\$ 0.63
Diluted earnings per ordinary share	\$ 0.11	\$ 0.90	\$ 0.62

4. Revenue

Disaggregated revenue disclosures for the fiscal years ended December 31, 2019, December 31, 2018, and December 31, 2017, are included below and in Note 16, Segmental Information.

<i>In millions</i>	Years ended December 31,								
	2019			2018			2017		
	Gas Cylinders	Elektron	Total	Gas Cylinders	Elektron	Total	Gas Cylinders	Elektron	Total
General industrial	\$ 46.0	\$ 111.7	\$ 157.7	\$ 50.7	\$ 123.9	\$ 174.6	\$ 49.6	\$ 95.6	\$ 145.2
Transportation	83.8	59.5	143.3	79.0	72.8	151.8	63.8	66.5	130.3
Defense and emergency	73.5	45.1	118.6	79.3	49.4	128.7	76.5	54.1	130.6
Healthcare	20.3	3.6	23.9	29.1	3.7	32.8	30.3	4.9	35.2
	\$ 223.6	\$ 219.9	\$ 443.5	\$ 238.1	\$ 249.8	\$ 487.9	\$ 220.2	\$ 221.1	\$ 441.3

The Company's performance obligations are satisfied over time as work progresses or at a point in time. Design and tooling arrangements are the only contracts for which revenue is recognized over time. Revenue from these sources combined accounted for less than 2% of the Company's revenue for the fiscal years ended December 31, 2019, and December 31, 2018, respectively. All consideration from contracts with customers is included in these amounts.

The following table provides information about contract receivables, contract assets and contract liabilities from contracts with customers:

<i>In millions</i>	December 31, 2019	December 31, 2018
Contract receivables	\$ 1.7	\$ 1.5
Contract assets	1.3	2.1
Contract liabilities	(0.5)	(1.1)

Contract assets consist of \$1.3 million accrued unbilled amounts relating to tooling revenue and are recognized as *prepayments and accrued income* in *accounts and other receivables* in the consolidated balance sheets. Of the \$2.1 million contract assets recognized as of December 31, 2018, \$2.0 million were billed to customers and transferred to receivables as of December 31, 2019. Contract assets recognized as of December 31, 2017, of \$4.6 million were all billed to customers and transferred to receivables in the fiscal year ending December 31, 2018.

Contract liabilities of \$0.5 million consist of advance payments and billing above costs incurred and are recognized as *other current liabilities*. Significant changes in contract liabilities balances during the period are as follows:

<i>In millions</i>	2019	2018
As at January 1,	\$ (1.1)	\$ (0.9)
Payments received / amounts billed	(0.9)	(3.8)
Costs incurred / revenue recognized	1.5	3.6
As at December 31,	\$ (0.5)	\$ (1.1)

5. Restructuring

During 2019, 2018 and 2017, we initiated and continued execution of certain business restructuring initiatives aimed at reducing our fixed cost structure and realigning our business.

In 2019, there was a further \$20.1 million of costs in relation to the previously announced closure of Luxfer Gas Cylinders' French site. There is an expectation that further costs will be incurred in, but not beyond 2020. Within the Elektron segment, there was \$4.6 million of asset write-downs and one-time employee benefits, following the decision to scale down production at one of our Luxfer Magtech sites. There were other simplification costs incurred of \$1.2 million across both segments.

In 2018, the restructuring charge included an other-than-temporary impairment and employee severance charges in the Gas Cylinders segment in relation to the Company's announcement that it was under consultation to close its French site. Within the Elektron segment, there have been asset write-downs in connection to the closure of our Luxfer Graphic Arts site in Findlay, OH, with consolidation of operations in Madison, IL; and the previously announced closure of our Luxfer Magtech site in Riverhead, NY.

The 2017 initiative included costs incurred in the Gas Cylinders segment following the decision to discontinue our Advanced Oxygen System (AOS) product line and the announced closure of our Luxfer HEI business. In the Elektron Segment, we announced the closure of our Luxfer Magtech site in Riverhead, NY, with consolidation of operations in Cincinnati OH. There was also a Company-wide effort to reduce headcount and streamline management, which contributed to the increase in severance and related costs in the year.

Restructuring related costs included in Restructuring charges in the Consolidated statement of income / (loss) are as follows:

<i>In millions</i>	Years ended December 31,		
	2019	2018	2017
Severance and related costs	\$ (20.9)	\$ (6.7)	\$ (4.6)
Asset impairment	(5.0)	(6.8)	(2.3)
Other	—	0.1	(1.5)
Total restructuring charges	\$ (25.9)	\$ (13.4)	\$ (8.4)

Other restructuring costs primarily consist of various contract termination and revision costs as well as legal costs.

Restructuring costs by reportable segment were as follows:

<i>In millions</i>	Years ended December 31,		
	2019	2018	2017
Gas Cylinders segment	\$ (20.7)	\$ (10.0)	\$ (2.9)
Elektron segment	(5.2)	(3.4)	(5.5)
Total restructuring charges	\$ (25.9)	\$ (13.4)	\$ (8.4)

Activity related to restructuring, recorded in *other current liabilities* in the consolidated balance sheets is summarized as follows:

<i>In millions</i>	2019	2018
Balance at January 1,	\$ 5.2	\$ 2.1
Costs incurred	20.9	6.6
Cash payments and other	(19.6)	(3.5)
Balance at December 31,	\$ 6.5	\$ 5.2

6. Other charges

The \$2.5 million other charges incurred in 2019, is the result of the Company's decision to commence a project to remove low-level naturally occurring radioactive material (NORM) from a redundant building at Elektron's Manchester, UK site. The work represents remediation of a legacy environmental issue and is expected to complete in the second quarter of 2020, but with no significant further costs envisioned.

The charge is being disclosed separately on the face of the condensed consolidated income statement as the NORM was created during the Company's historic production process and the remediation is not indicative of the current trading performance of the Company.

7. Goodwill and other identifiable intangible assets

Changes in goodwill during the years ended December 31, 2019 and 2018 were as follows:

<i>In millions</i>	Gas Cylinders	Elektron	Total
At January 1, 2018	\$ 29.0	\$ 42.2	\$ 71.2
Impairments	(1.3)	—	(1.3)
Exchange difference	(1.4)	(0.9)	(2.3)
At December 31, 2018	\$ 26.3	\$ 41.3	\$ 67.6
Exchange difference	0.7	0.5	1.2
Net balance at December 31, 2019	\$ 27.0	\$ 41.8	\$ 68.8

Accumulated goodwill impairment losses were \$9.6 million as of December 31, 2019 and 2018.

Identifiable intangible assets consisted of the following:

<i>In millions</i>	December 31, 2019			December 31, 2018		
	Gross	Accumulated amortization	Net	Gross	Accumulated amortization	Net
Customer relationships	\$ 13.4	\$ (4.6)	\$ 8.8	\$ 13.4	\$ (3.8)	\$ 9.6
Technology and trading related	8.1	(3.3)	4.8	7.9	(2.9)	5.0
	\$ 21.5	\$ (7.9)	\$ 13.6	\$ 21.3	\$ (6.7)	\$ 14.6

Identifiable intangible asset amortization expense in 2019, 2018 and 2017 was \$1.2 million, \$1.2 million and \$1.3 million, respectively.

In 2018, we recorded, within impairment charges, an impairment charge of \$1.3 million in the Gas Cylinders segment, associated with our Superform business unit.

In 2017, we recorded, within restructuring charges, an impairment charge of \$0.5 million in the Gas Cylinders segment for technology and trading related intangibles following the announcement to exit our Luxfer HEI business.

Intangible asset amortization expense over the next five years is expected to be approximately \$1.1 million in 2020, \$1.1 million in 2021, \$1.1 million in 2022, \$1.1 million in 2023 and \$1.1 million in 2024.

The weighted-average amortization period for the customer relationships is 11 years and for the technology and trading related assets is 12 years.

8. Supplementary balance sheet information

<i>In millions</i>	2019	2018
Accounts and other receivables		
Trade receivables	\$ 52.4	\$ 49.8
Related parties	2.7	0.9
Prepayments and accrued income	6.7	7.7
Derivative financial instruments	0.3	0.1
Other receivables	4.2	4.2
Total accounts and other receivables	\$ 66.3	\$ 62.7
Inventories		
Raw materials and supplies	\$ 33.4	\$ 30.5
Work-in-process	32.2	33.1
Finished goods	28.9	30.0
Total inventories	\$ 94.5	\$ 93.6
Other current assets		
Held-for-sale assets	\$ 3.9	\$ 10.7
Income tax receivable	1.1	—
Total other current assets	\$ 5.0	\$ 10.7
Property, plant and equipment, net		
Land, buildings and leasehold improvements	\$ 68.1	\$ 73.3
Machinery and equipment	287.7	286.0
Construction in progress	8.9	10.1
Total property plant and equipment	364.7	369.4
Accumulated depreciation and impairment	(265.8)	(262.5)
Total property, plant and equipment, net	\$ 98.9	\$ 106.9
Current maturities of long-term debt and short-term borrowings		
Overdrafts	—	3.5
Total current maturities of long-term debt and short-term borrowings	\$ —	\$ 3.5
Other current liabilities		
Contingent liabilities	\$ 6.6	\$ 5.3
Held-for-sale liabilities	—	2.5
Operating lease liability	3.3	3.5
Other current liabilities	2.4	4.1
Total other current liabilities	\$ 12.3	\$ 15.4
Other non-current liabilities		
Contingent liabilities	\$ 0.9	\$ 0.8
Operating lease liability	11.7	14.9
Other non-current liabilities	0.2	0.5
Total other non-current liabilities	\$ 12.8	\$ 16.2

8. Supplementary balance sheet information (continued)

Impairment of property, plant and equipment

Property, plant and equipment, net, includes an impairment of \$4.6 million recognized within restructuring charges and \$5.2 million recognized within impairment charges in 2019 (2018: \$6.6 million and nil).

The \$4.6 million (2018: \$1.5 million) recognized within restructuring charges in 2019 relates to the write-down of land and buildings within the Elektron segment as a result of announced exits. In 2018 there was \$5.1 million relating to rationalization activity in the Gas Cylinders segment.

The \$5.2 million recognized within impairment charges in 2019 relates to the downturn in the European luxury automotive market which has adversely impacted our Superform business within the Gas Cylinders segment.

Held-for-sale assets

In 2019, there was one building valued at \$3.7 million, within our Elektron Segment classified as held-for-sale assets, presented within other current assets. The building was classified as held-for-sale in 2018, as the expectation was that the building would be sold in 2019. There are conditions attached to the sale which the Company expects to be met in 2020 and as such the building continues to be classified as held-for-sale.

There is also \$0.2 million of inventory which has been reclassified as held-for-sale assets, in relation to one of our operations within our Gas Cylinders Segment.

During 2018, two buildings valued at \$4.7 million, within our Elektron Segment were classified as held-for-sale assets, presented within *other current assets*. The buildings were part of separate site closures announced in 2017 (Riverhead, NY) and early 2018 (Findlay, OH) and were readily available for sale at December 31, 2018. The buildings were impaired to their fair value less costs to sell, with the impairment (\$1.1 million) disclosed within *restructuring charges* in the consolidated statement of income in 2017. The property at Findlay, OH, was sold during the first half of 2019; the site at Riverhead, NY is now expected to be sold during 2020 and is included within *held-for-sale assets* as at December 31, 2019.

The Company was actively marketing and was in negotiations with a third party during the fourth quarter of 2018 with a view to selling its Magnesium Elektron CZ s.r.o. subsidiary, which was involved in magnesium recycling and based in the Czech Republic. This led to the business being classified as held-for-sale and written down to fair value less costs to sell. An offer was received and subsequently accepted in February 2019. The \$3.4 million charge is presented within *impairment charges* in the consolidated statement of income in 2018 and has been allocated to property, plant and equipment. The transaction was completed in the first half of 2019.

The respective assets and liabilities of the above disposal groups have been reclassified as held-for-sale within other current assets and other current liabilities per the table below.

Reclassified to held-for-sale assets	December 31,		December 31,	
	2019		2018	
<i>In millions</i>				
Property, plant and equipment	\$	3.7	\$	5.5
Inventory		0.2		2.9
Accounts and other receivables		—		2.3
Held-for-sale assets	\$	3.9	\$	10.7
Reclassified to held-for-sale liabilities				
Accounts payables	\$	—	\$	2.5
Held-for-sale liabilities	\$	—	\$	2.5

As a result of items reclassified to held-for-sale, there has been no reclassification of items from other comprehensive income to the income statement.

9. Accumulated Other Comprehensive Loss

Components of Accumulated Other Comprehensive Loss consist of the following:

<i>In millions</i>	December 31, 2019	December 31, 2018
Cumulative translation adjustments	\$ (55.5)	\$ (55.6)
Pension plans actuarial loss, net of tax	(94.1)	(90.2)
Change in market value of derivative financial instruments, net of tax	—	(0.8)
Accumulated other comprehensive loss	\$ (149.6)	\$ (146.6)

Reclassifications within accumulated other comprehensive loss

During 2019, a \$0.5 million translation loss was reclassified out of the hedging reserve and into cumulative translation adjustments. There was no net impact on accumulated other comprehensive loss.

Reclassifications out of accumulated other comprehensive loss

During 2019, a \$2.5 million translation gain (2018: nil) was reclassified out of accumulated other comprehensive loss and into the income statement, within *acquisition related costs / credits*. This amount was realized on the disposal of Elektron's magnesium recycling business in the Czech Republic.

10. Debt

Debt outstanding was as follows:

<i>In millions</i>	December 31, 2019	December 31, 2018
3.67% Loan Notes due 2021	\$ 25.0	\$ 25.0
4.88% Loan Notes due 2023	25.0	25.0
4.94% Loan Notes due 2026	25.0	25.0
Revolving credit facility	17.5	—
Other - Bank overdraft	—	3.5
Unamortized debt issuance costs	(1.1)	(1.4)
Total debt	\$ 91.4	\$ 77.1
Less current portion	—	(3.5)
Non-current debt	\$ 91.4	\$ 73.6

On July 31, 2017, an extension to the Senior Facilities Agreement was agreed which provides \$150 million in committed debt facilities, in the form of a multi-currency revolving credit facility, with an additional \$50 million of uncommitted facilities through an accordion provision. The Senior Facilities Agreement was due to mature in April 2019, but has now been extended until the end of July 2022. Finance costs of \$1.0 million were capitalized following this extension. The loan amendment has been treated, in part, as an extinguishment and new loan, as some of the lenders left the consortium, with the other portion deemed to be a modification of the existing facility. The Senior Facility Agreement bears interest equal to a margin based upon the Company's leverage plus either EURIBOR or LIBOR, depending on the currency drawn down.

The weighted-average interest rate on the revolving credit facility was 2.47% and 3.58% in 2019 and 2018, respectively.

The maturity profile of the Company's debt, excluding unamortized issuance costs and discounts is as follows:

<i>In millions</i>	2020	2021	2022	2023	2024	Thereafter	Total
Loan Notes due 2021	\$ —	\$ 25.0	\$ —	\$ —	\$ —	\$ —	\$ 25.0
Loan Notes due 2023	—	—	—	25.0	—	—	25.0
Loan Notes due 2026	—	—	—	—	—	25.0	25.0
Revolving credit facility	—	—	17.5	—	—	—	17.5
Total debt	\$ —	\$ 25.0	\$ 17.5	\$ 25.0	\$ —	\$ 25.0	\$ 92.5

10. Debt (continued)

Loan notes due and shelf facility

The Note Purchase and Private Shelf Agreement contains the same customary covenants and events of default as for the Note Purchase Agreement. The Note Purchase and Private Shelf Agreement also requires us to maintain compliance with the same interest and leverage ratios as for the Note Purchase Agreement. Amounts drawn under the Shelf Facility in June 2016 were used to facilitate an extension of the maturity of \$50 million of the outstanding principal amount of the Loan Notes due 2018.

We have been in compliance with the covenants under the Note Purchase and Private Shelf Agreement throughout all of the quarterly measurement dates from and including September 30, 2014, to December 31, 2019.

The Loan Notes due 2021, 2023 and 2026, the Shelf Facility and the Note Purchase and Private Shelf Agreement are governed by the law of the State of New York.

Senior Facilities Agreement

The Senior Facilities Agreement contains a number of additional undertakings and covenants that, among other things, restrict, subject to certain exceptions, our and our subsidiaries' ability to:

- engage in mergers, divestitures, consolidations or divisions;
- change the nature of our business;
- make certain acquisitions;
- participate in certain joint ventures;
- grant liens or other security interests on our assets;
- sell, lease, transfer or otherwise dispose of assets, including receivables;
- enter into certain non-arm's-length transactions;
- grant guarantees;
- pay off certain existing indebtedness;
- make investments, loans or grant credit;
- repurchase our shares;
- issue shares or other securities; and
- redeem, repurchase, decrease, retire or repay any of our share capital.

We are permitted to dispose of assets up to \$25 million in aggregate until July 2022, without restriction as to the use of the proceeds under the Senior Facilities Agreement. Above this level, we would need to seek agreement from the majority of the lenders under the Senior Facilities Agreement. In addition, we may pay dividends, subject to certain limitations.

In addition, the Senior Facilities Agreement requires us to maintain compliance with an interest coverage ratio and a leverage ratio. The interest coverage ratio measures our EBITDA (as defined in the Senior Facilities Agreement) to Net Finance Charges (as defined in the Senior Facilities Agreement). We are required to maintain a minimum interest coverage ratio of 4.0:1. The leverage ratio measures our Total Net Debt (as defined in the Senior Facilities Agreement) to the Relevant Period Adjusted Acquisition EBITDA (as defined in the Senior Facilities Agreement). We are required to maintain a leverage ratio of no more than 3.0:1.

Any breach of a covenant in the Senior Facilities Agreement could result in a default under the Senior Facilities Agreement, in which case lenders could elect to declare all borrowed amounts immediately due and payable if the default is not remedied or waived within any applicable grace periods. Additionally, our and our subsidiaries' ability to make investments, incur liens and make certain restricted payments is also tied to ratios based on EBITDA.

We have been in compliance with the covenants under the Senior Facilities Agreement throughout all of the quarterly measurement dates from and including September 30, 2011, to December 31, 2019.

11. Derivatives and Financial Instruments

The Company's financial instruments comprise bank and other loans, senior loan notes, derivatives, trade payables, deferred and deferred contingent consideration. Other than derivatives, the main purpose of these financial instruments is to raise finance for the Company's operations. The Company also has various financial assets such as trade receivables and cash and cash equivalents, which arise directly from its operations.

Derivative financial instruments

We are exposed to market risk during the normal course of business from changes in currency exchange rates, interest rates and commodity prices such as aluminum prices. We manage exposures through a combination of normal operating and financing activities and through the use of derivative financial instruments such as foreign currency forward purchase contracts and aluminum forward purchase contracts. We do not use market risk-sensitive instruments for trading or speculative purposes. In 2019, the Company had \$0.3 million (2018: \$0.1 million) derivative financial instruments disclosed within accounts and other receivables. The value of derivative financial instruments recorded in liabilities in 2019 and 2018 was less than \$0.1 million.

At December 31, 2019, the fair value of forward foreign currency exchange contracts deferred in equity was nil (2018: loss of \$0.4 million and 2017: loss of \$0.7 million). During 2019, a gain of \$0.1 million (2018: loss of \$0.1 million and 2017: gain of \$0.6 million) has been transferred to the consolidated income statement in respect of contracts that have matured in the year.

Aluminum forward purchase contracts

Aluminum is traded on the London Metal Exchange ("LME") and therefore the Group is able to use LME derivative contracts to hedge a portion of its price exposure. In 2019 the Group purchased approximately 12,000 (2018: 11,500) metric tons of primary aluminum. The processed waste can be sold as scrap aluminum at prices linked to the LME price. Based on the 2019 level of aluminum purchases, a \$100 increase in the LME price of aluminum would increase our Gas Cylinders segment's costs by approximately \$1.2 million.

Forward foreign currency exchange contracts

The Company incurs currency transaction risk whenever one of the Company's operating subsidiaries enters into either a purchase or sales transaction in a currency other than its functional currency. Currency transaction risk is reduced by matching sales and expenses in the same currency. The Company's U.S. operations have little currency exposure as most purchases, costs and sales are conducted in U.S. dollars. The Company's U.K. operations are exposed to exchange transaction risks, mainly because these operations sell goods priced in euros and U.S. dollars, and purchase raw materials priced in U.S. dollars. The Company also incurs currency transaction risk if it lends currency other than its functional currency to one of its joint venture partners.

At December 31, 2019 and 2018, the Company held various forward foreign currency exchange contracts designated as hedges in respect of forward sales for U.S. dollars, euros and Japanese yen for the receipt of GBP sterling or euros. The Company also held forward foreign currency exchange contracts designated as hedges in respect of forward purchases for U.S. dollars, euros and Canadian dollars by the sale of GBP sterling. The contract totals in GBP sterling and euros, range of maturity dates and range of exchange rates are disclosed below, with the value denominated in GBP sterling given that is the currency the majority of the contracts are held in.

11. Derivatives and Financial Instruments (continued)

Derivative financial instruments (continued)

December 31, 2019				
Sales hedges	U.S. dollars	Euros	Japanese Yen	
Contract totals/£m	0.1	7.6	0.1	
Maturity dates	01/20	01/20 to 03/20	01/20	
Exchange rates	1.2914	€1.1551 to €1.1750	JPY	142.86

Purchase hedges	U.S. dollars	Euros	Canadian dollars	
Contract totals/£m	1.3	0.8	7.0	
Maturity dates	03/20	03/20	01/20	
Exchange rates	1.3228	€	1.1663	\$1.7137 to \$1.7664

December 31, 2018				
Sales hedges	U.S. dollars		Euros	
Contract totals/£m	4.8		7.2	
Maturity dates	01/19 to 07/19		01/19 to 07/19	
Exchange rates	\$1.2519 to \$1.3419		€1.0949 to €1.1702	

Purchase hedges	U.S. dollars	Euros	Canadian dollars	Czech koruna
Contract totals/£m	7.5	1.7	2.9	0.1
Maturity dates	01/19 to 07/19	01/19 to 06/19	01/19 to 03/19	01/19
Exchange rates	\$1.2609 to \$1.3380	€1.1074 to €1.1221	\$1.7039 to \$1.7416	CZK 28.449

The above contracts are held in GBP sterling, therefore the analysis in the table has been given in GBP sterling to avoid any movements as a result of translation.

Fair value of financial instruments

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

Cash at bank and in hand / overdrafts

The carrying value approximates to the fair value as a result of the short-term maturity of the instruments. Cash at bank and in hand are subject to a right to offset in the U.S.

Overdrafts

At December 31, 2019, the Company had no overdrafts, in 2018 \$3.5 million were disclosed within other current liabilities with its carrying value being equal to its fair value. All of the balance at December 31, 2018 was subject to variable interest rate and subject to floating interest rate risk.

Bank loans

At December 31, 2019, bank and other loans of \$92.5 million (2018: \$75.0 million) were outstanding. At December 31, 2019, bank and other loans are shown net of issue costs of \$1.1 million (2018: \$1.4 million), and these issue costs are to be amortized to the expected maturity of the facilities. This carrying value is equal to its fair value. At December 31, 2019, \$17.5 million (2018: none) of the total \$92.5 million (2018: \$75.0 million) bank and other loans was variable interest rate debt and subject to floating interest rate risk, with the remainder being fixed rate debt.

11. Derivatives and Financial Instruments (continued)

Fair value of financial instruments (continued)

Forward foreign currency exchange rate contracts

The fair value of these contracts was calculated by determining what the Company would be expected to receive or pay on termination of each individual contract by comparison to present market prices.

LME derivative contracts

The fair value of these contracts has been calculated by valuing the contracts against the equivalent forward rates quoted on the LME.

Deferred contingent consideration

Disclosure of the basis of calculation of the fair value of deferred contingent consideration is included within Note 2 of the consolidated financial statements.

Deferred consideration

The deferred consideration is a fixed amount that was determinable at the date of the acquisition of the Specialty Metals business and paid in 2018.

The Company uses the following hierarchy for determining and disclosing the fair value of financial instruments by valuation technique:

Level 1: quoted (unadjusted) prices in active markets for identical assets or liabilities.

Level 2: other techniques for which all inputs which have a significant effect on the recorded fair value are observable, either directly or indirectly.

Level 3: techniques which use inputs which have a significant effect on the recorded fair value that are not based on observable market data.

The fair values of the financial instruments of the Group at December 31, 2019, were analyzed using the hierarchy as follows:

<i>In millions</i>	Total	Level 1	Level 2	Level 3
Derivative financial assets:				
Foreign currency contract assets	\$ 0.3	\$ —	\$ 0.3	\$ —
Interest bearing loans and borrowings:				
Loan Notes due 2021	25.0	—	25.0	—
Loan Notes due 2023	24.9	—	24.9	—
Loan Notes due 2026	24.8	—	24.8	—
Revolving credit facility	16.7	—	16.7	—
Other financial liabilities:				
Deferred contingent consideration	0.5	—	—	0.5

The following table presents the changes in Level 3 instruments for the year ended December 31, 2019.

<i>In millions</i>	2019
Balance at January 1	\$ 0.9
Payments made during year	(0.5)
Unwind of discount on deferred consideration	0.2
Remeasurement of deferred consideration (recognized in acquisition-related costs)	(0.1)
Balance at December 31	\$ 0.5
Total losses for the period included in profit and loss for assets held at the end at December 31	0.1
Change in unrealized (gains) or losses for the period included in profit and loss for assets held at the end at December 31	\$ 0.1

The deferred contingent consideration relates to estimates of amounts payable in the future regarding acquisitions made in prior years. This deferred contingent consideration is based upon an estimate of the future profitability of the businesses versus targets agreed upon as part of the acquisitions.

12. Income Taxes

Income before income taxes consisted of the following:

<i>In millions</i>	Years ended December 31,		
	2019	2018	2017
U.K.	\$ 8.0	\$ 26.2	\$ (3.0)
International ⁽¹⁾	1.8	4.3	22.9
Income before income taxes	\$ 9.8	\$ 30.5	\$ 19.9

⁽¹⁾ "International" reflects non-U.K. income before income taxes.

The provision for income taxes consisted of the following:

<i>In millions</i>	Years ended December 31,		
	2019	2018	2017
Currently payable			
U.K.	\$ 0.7	\$ 0.2	\$ (0.2)
International ⁽¹⁾	2.8	5.1	6.2
Total current taxes	\$ 3.5	\$ 5.3	\$ 6.0
Deferred			
U.K.	\$ 3.7	\$ 3.4	\$ (0.1)
International ⁽¹⁾	(0.5)	(3.2)	(2.6)
Total deferred taxes	\$ 3.2	\$ 0.2	\$ (2.7)
Total provision for income taxes	\$ 6.7	\$ 5.5	\$ 3.3

⁽¹⁾ "International" reflects non-U.K. income taxes.

Differences between the financial reporting and the corresponding tax basis of assets and liabilities and the different income tax rates and laws applicable to the Company, among other factors, give rise to permanent differences between the statutory tax rate applicable in the U.K. and the effective tax rate presented in the consolidated income statement, which in 2019, 2018 and 2017 were as follows:

<i>In millions</i>	Years ended December 31,		
	2019	2018	2017
Income before income taxes	\$ 9.8	\$ 30.5	\$ 19.9
Provision for income taxes at the U.K. statutory tax rate (2019: 19%, 2018:19%, 2017: 19.25%)	1.9	5.8	3.8
Effect of:			
Non-deductible expenses	2.7	0.1	0.8
Movement in valuation allowances	1.2	—	(0.9)
Differences in income tax rates in countries where the Company operates ⁽¹⁾	1.0	0.3	2.2
Effect of U.S. tax reform	—	—	(4.0)
Effect of changes in tax rates (excluding U.S. tax reform) ⁽²⁾	(0.1)	0.2	1.1
Movement in uncertain tax positions	0.4	0.1	0.9
Other	(0.4)	(1.0)	(0.6)
Total provision for income taxes	\$ 6.7	\$ 5.5	\$ 3.3

⁽¹⁾ Refers mainly to the effects of the differences between the statutory income tax rate in the U.K. against the applicable income tax rates of each country where the Company operates.

⁽²⁾ The U.K. corporation tax rate decreased from 20% to 19% with effect from April 1, 2017. A further reduction in the U.K. corporation tax rate is expected to 17% from April 1, 2020.

12. Income Taxes (continued)

The US tax reform included complex tax provisions, and it is understood that the Department of Treasury and IRS may offer additional guidance about their application and effect. The Company does not expect to have to book any further related adjustments, however we will review any updates in interpretations and information as they become available. The Company is below the size thresholds for application of the base erosion and anti-avoidance tax (BEAT). The Company does not have material global intangible low-taxed income (GILTI) or foreign derived intangible income (FDII), and is not currently subject to any material restriction under the net interest expense limitation.

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

<i>In millions</i>	Years ended December 31,		
	2019	2018	2017
Beginning balance	\$ 3.2	\$ 2.8	\$ 1.9
Gross increases based on tax positions related to the current year	0.6	1.4	1.0
Reductions due to expiry of statute of limitations	(0.6)	(1.0)	(0.1)
Ending balance	\$ 3.2	\$ 3.2	\$ 2.8
Non-current	\$ 3.2	\$ 3.2	\$ 2.8

The Company's unrecognized tax benefits relate to the pricing of its various inter-company transactions. Because the transfer pricing calculation is often multifaceted, taking into account economics, finance, industry practice, and functional analysis, a company's transfer pricing position often sits at a particular point along a wide continuum of possible pricing outcomes. The inherent subjectivity in pricing inter-company balances gives rise to measurement uncertainty. Management has considered the valuation uncertainty in determining the measurement of the uncertain tax position. There are no current tax audit examinations. Management estimates that it is reasonably possible that approximately \$0.2 million of our gross unrecognized tax benefits (\$0.1 million of our net unrecognized tax benefits) may be recognized by the end of 2020 as a result of a lapse of the statute of limitations.

At December 31, 2019, 2018 and 2017, there were \$0.7 million, \$0.7 million, and \$0.6 million of unrecognized tax benefits respectively, that if recognized would affect the annual effective tax rate.

The Company recognizes interest accrued and penalties relating to unrecognized tax benefits in the income tax line. During the years ended December 31, 2019, 2018 and 2017, the Company recognized approximately \$nil, \$nil and \$nil respectively, in interest and penalties.

The following is a summary of the tax years open by major tax jurisdiction:

<i>Jurisdiction</i>	Years open
U.K.	2018 - 2019
U.S. Federal	2016 - 2019
U.S. State and local	2016 - 2019
France	2016 - 2019
Germany	2015 - 2019
China	2016 - 2019
Canada	2015 - 2019

12. Income Taxes (continued)

Taxes have not been provided on undistributed earnings of subsidiaries where it is our intention to reinvest these earnings permanently or to repatriate the earnings only when it is tax efficient to do so. The amount of unremitted earnings at December 31, 2019, was approximately \$47.2 million (at December 31, 2018: \$62.4 million, at December 31, 2017: \$59.0 million). If these earnings were remitted, it is estimated that the additional income tax arising would be approximately \$0.7 million (at December 31, 2018: \$0.6 million, at December 31, 2017: \$0.3 million).

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

<i>In millions</i>	December 31,	
	2019	2018
Deferred tax assets	\$ 15.8	\$ 18.6
Deferred tax liabilities	(2.5)	(3.5)
Net deferred tax assets	\$ 13.3	\$ 15.1

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

<i>In millions</i>	December 31,	
	2019	2018
Deferred tax assets		
Pension benefits	\$ 5.8	\$ 7.7
Tax loss and credit carry forwards	23.8	20.7
Other	3.5	5.2
Total deferred tax assets	33.1	33.6
Valuation allowances	(16.2)	(15.0)
Deferred tax assets, net of valuation allowances	\$ 16.9	\$ 18.6
Deferred tax liabilities		
Property, plant and equipment	\$ 3.6	\$ 3.5
Total deferred tax liabilities	\$ 3.6	\$ 3.5
Net deferred tax assets	\$ 13.3	\$ 15.1

Deferred tax liabilities and assets represent the tax effect of temporary differences between the value of assets and liabilities for financial statement purposes and such values as measured by the relevant jurisdiction's tax laws and regulations. Deferred tax assets and liabilities from the same tax jurisdiction have been netted, resulting in assets and liabilities being recorded under the deferred taxation captions on the consolidated balance sheet.

In assessing the realizability of deferred tax assets, management considers whether it is more likely than not that some portion or all of the deferred tax assets will not be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences and carryforwards become deductible or creditable. Management considers the scheduled reversal of existing taxable temporary differences, projected future taxable income, and tax-planning strategies in making this assessment.

12. Income Taxes (continued)

At December 31, 2019, the Company had carried forward tax losses and tax credits of \$94.9 million (U.K.: \$32.8 million, non-U.K.: \$62.1 million). Carried forward tax losses and tax credits for 2018 were \$81.0 million (U.K.: \$38.8 million, non-U.K.: \$42.2 million) and for 2017 were \$92.7 million (U.K.: \$43.4 million, non-U.K.: \$49.3 million). To the extent that these losses are not already recognized as deferred income taxes assets, and are available to offset against future taxable profits, it is expected that the future effective tax rate would be below the standard rate in the country where the profits are offset. A valuation allowance of \$14.9 million (2018: \$15.0 million, 2017: \$15.0 million) exists for deferred tax benefits related to the tax loss and tax credit carry forwards and other benefits that may not be realized. The apportionment of the valuation allowance between the U.K. and non-U.K. jurisdictions is U.K.: \$2.8 million, non-U.K.: \$12.1 million (2018: U.K.: \$4.1 million, non-U.K.: \$10.9 million; 2017: U.K.: \$4.6 million, non-U.K.: \$10.4 million). The non-U.K. valuation allowances relate predominantly to tax losses in France, Germany and Canada.

Of the carried forward tax losses and tax credits as at December 31, 2019, \$26.4 million expire between 2023 and 2034 and \$68.5 million are available for indefinite carry-forward.

13. Pension Plans

The Company has defined benefit pension plans in the U.K., the U.S. and France. The levels of funding are determined by periodic actuarial valuations. The assets of the plans are generally held in separate trustee-administered funds. The Company also operates defined contribution plans in the U.K., the U.S., Australia and Canada.

The "10% corridor" method for recognizing gains and losses has been adopted. This methodology means that cumulative gains and losses up to an amount equal to 10% of the higher of the liabilities and the assets (the corridor) have no impact on the pension cost. Cumulative gains or losses greater than this corridor are amortized over the average future lifetime of the members in the Plans.

The principal defined benefit pension plans in the Company is the U.K. Luxfer Group Pension Plan ("the Plan"), which closed to new members in 1998, new employees then being eligible for a defined contribution plan. In April 2016, the Plan was closed to further benefit accrual with members being offered contributions to a defined contribution plan. The Company's other arrangements are less significant than the Plan, the largest being the BA Holdings, Inc. Pension Plan in the U.S. In December 2005, this plan was closed to further benefit accrual with members being offered contributions to that company's 401(k) plan. At January 1, 2016, the U.S. pension plans (BA Holdings, Inc. Pension Plan and Luxfer Hourly Pension Plan) merged into one plan.

The following tables present reconciliations of plan benefit obligations, fair value of plan assets and the funded status of pension plans as of and for the years ended December 31, 2019 and 2018:

<i>In millions</i>	2019	2019	2019	2018	2018	2018
	U.K.	U.S./ other	Total	U.K.	U.S./ other	Total
Change in benefit obligations						
Benefit obligation at January 1	\$ 315.2	\$ 46.8	\$ 362.0	\$ 369.7	\$ 53.1	\$ 422.8
Service cost	—	0.1	0.1	—	0.1	0.1
Interest cost	9.2	1.9	11.1	8.6	1.8	10.4
Curtailement gain	—	(1.8)	(1.8)	—	—	—
Settlement gain	—	(2.7)	(2.7)	—	—	—
Actuarial loss / (gain)	38.4	5.0	43.4	(27.7)	(5.9)	(33.6)
Exchange difference	10.0	—	10.0	(19.7)	(0.1)	(19.8)
Benefits paid	(13.6)	(2.2)	(15.8)	(17.9)	(2.2)	(20.1)
Prior service cost	—	—	—	2.2	—	2.2
Benefit obligation at December 31	\$ 359.2	\$ 47.1	\$ 406.3	\$ 315.2	\$ 46.8	\$ 362.0
Change in plan assets						
Fair value of plan assets at January 1	\$ 283.4	\$ 38.6	\$ 322.0	\$ 326.3	\$ 41.2	\$ 367.5
Actual return on assets	45.4	6.7	52.1	(13.0)	(2.5)	(15.5)
Exchange difference	7.6	—	7.6	(17.8)	—	(17.8)
Contributions from employer	5.9	2.0	7.9	5.8	2.1	7.9
Benefits paid	(13.6)	(2.2)	(15.8)	(17.9)	(2.2)	(20.1)
Settlement loss	—	(2.7)	(2.7)	—	—	—
Fair value of plan assets at December 31	\$ 328.7	\$ 42.4	\$ 371.1	\$ 283.4	\$ 38.6	\$ 322.0
Funded status						
Benefit obligations in excess of the fair value of plan assets	\$ (30.5)	\$ (4.7)	\$ (35.2)	\$ (31.8)	\$ (8.2)	\$ (40.0)

The net benefit obligations of \$35.2 million and \$40.0 million at December 31, 2019, and December 31, 2018, respectively, are recorded in non-current liabilities in the consolidated balance sheets.

13. Pension Plans (continued)

The amounts recognized in the consolidated statements of income in respect of the pension plans were as follows:

<i>In millions</i>	2019	2019	2019	2018	2018	2018	2017	2017	2017
	U.K.	U.S. / other	Total	U.K.	U.S. / other	Total	U.K.	U.S. / other	Total
<i>In respect of defined benefit plans:</i>									
Current service cost	\$ —	\$ 0.1	\$ 0.1	\$ —	\$ 0.1	\$ 0.1	\$ —	\$ 0.1	\$ 0.1
Interest cost	9.2	1.9	11.1	8.6	1.8	10.4	8.9	1.9	10.8
Expected return on assets	(13.4)	(2.3)	(15.7)	(14.5)	(2.2)	(16.7)	(14.8)	(1.8)	(16.6)
Curtailment gain	—	(1.8)	(1.8)	—	—	—	—	—	—
Settlement loss	—	0.8	0.8	—	—	—	—	—	—
Amortization of net actuarial loss	2.5	0.6	3.1	2.3	0.4	2.7	2.5	0.3	2.8
Amortization of prior service credit	(0.4)	—	(0.4)	(0.5)	—	(0.5)	(0.5)	—	(0.5)
Total (credit) / charge for defined benefit plans	\$ (2.1)	\$ (0.7)	\$ (2.8)	\$ (4.1)	\$ 0.1	\$ (4.0)	\$ (3.9)	\$ 0.5	\$ (3.4)
<i>In respect of defined contribution plans:</i>									
Total charge for defined contribution plans	\$ 2.1	\$ 2.1	\$ 4.2	\$ 2.1	\$ 2.3	\$ 4.4	\$ 1.9	\$ 2.1	\$ 4.0
Total charge / (credit) for pension plans	\$ —	\$ 1.4	\$ 1.4	\$ (2.0)	\$ 2.4	\$ 0.4	\$ (2.0)	\$ 2.6	\$ 0.6

In accordance with ASC 715, defined benefit pension charge / (credit) is split in the income statement, with \$0.3 million (2018: \$0.7 million; 2017: \$0.8 million) of expenses recognized within sales, general and administrative expenses, a credit of \$1.8 million (2018 and 2017 nil) in relation to the curtailment gain on the French pension plan, recognized in restructuring charges and a credit of \$1.3 million (2018: \$4.7 million credit; 2017: \$4.2 million credit) recognized below operating income in the income statement.

The following table shows other changes in plan assets and benefit obligations recognized in other comprehensive income (loss) ("AOCI") during the years ended December 31:

<i>In millions</i>	2019	2018
Net actuarial (loss) / gain	\$ (7.5)	\$ 1.4
Amortization of actuarial loss	3.1	2.7
Prior service cost	—	(2.2)
Amortization of prior service credit	(0.4)	(0.5)
Total recognized in other comprehensive loss	(4.8)	1.4
<i>Total credit recognized in net periodic benefit cost and other comprehensive income</i>	\$ (2.0)	\$ 5.4

The estimated net loss for defined benefit plans included in AOCI that will be recognized in net periodic benefit cost during 2020 is \$2.4 million, consisting of amortization of net actuarial loss of \$2.8 million, partially offset by amortization of prior service credit of \$0.4 million.

The following table shows the amounts included in AOCI that have not yet been recognized as components of net periodic benefit cost for the years ended December 31:

<i>In millions</i>	2019	2018
Net actuarial loss	\$ (140.8)	\$ (136.4)
Net prior service credit	12.3	12.7
Total included in AOCI not yet recognized in the statement of loss	\$ (128.5)	\$ (123.7)

13. Pension Plans (continued)

The financial assumptions used in the calculations were:

	Projected Unit Credit Valuation					
	U.K.			U.S.		
	2019	2018	2017	2019	2018	2017
	%	%	%	%	%	%
Discount rate	2.10	2.90	2.40	3.10	4.20	3.60
Expected return on assets	4.10	4.90	4.80	6.20	6.20	6.00
Retail price inflation	2.90	3.30	3.10	n/a	n/a	n/a
Inflation related assumptions:						
Salary inflation	n/a	n/a	n/a	n/a	n/a	n/a
Consumer price inflation	2.00	2.20	2.10	n/a	n/a	n/a
Pension increases—pre April 6, 1997	1.80	2.00	1.90	n/a	n/a	n/a
—1997 - 2005	2.10	2.20	2.10	n/a	n/a	n/a
—post April 5, 2005	1.70	1.80	1.70	n/a	n/a	n/a

The discount rate used represents the annualized yield based on a cash-flow matched methodology with reference to an AA corporate bond spot curve and having regard to the duration of the Plan's liabilities. The inflation rate is derived using a similar cash flow matched methodology as used for the discount rate but having regard to the difference between yields on fixed-interest and index-linked United Kingdom government gilts. The expected return on assets assumption is set having regard to the asset allocation and expected return on each asset class as at the balance sheet date.

Other principal actuarial assumptions:	2019	2018
	Years	Years
Life expectancy of male / female in the U.K. aged 65 at accounting date	21.5 / 24.2	21.4 / 24.1
Life expectancy of male / female in the U.K. aged 65 at 20 years after accounting date	22.8 / 25.7	22.8 / 25.7

Investment strategies

For the principal defined benefit plan in the Company and the U.K., the Luxfer Group Pension Plan, the assets are invested in a diversified range of asset classes and include matching assets (comprising fixed-interest and index-linked bonds and swaps) and growth assets (comprising all other assets). The Trustees of the Plan have formulated a de-risking strategy to help control the short-term risk of volatility associated with holding growth assets. The Trustees also monitor the cost of a buy-in to secure pensioner liabilities with an insurance company to ensure they and the Company are able to act if such an opportunity arises. Other options to progressively reduce the scale of the liabilities are discussed between the Trustees and the Company.

Risk exposures

The Company is at risk of adverse experience relating to the defined benefit plans.

The plans hold a high proportion of assets in equity and other growth investments, with the intention of growing the value of assets relative to liabilities. The Company is at risk if the value of liabilities grows at a faster rate than the plans assets, or if there is a significant fall in the value of these assets not matched by a fall in the value of liabilities. If these events occurred, this would be expected to lead to an increase in the Company's future cash contributions.

13. Pension Plans (continued)

Special events

In June 2019, the closure of Luxfer Gas Cylinders' French site affected the French pension plan. This resulted in a curtailment gain of \$1.8 million and triggered immediate recognition of the unamortized net actuarial losses of \$0.3 million.

In December 2019, the U.S. plan offered deferred members the opportunity to receive a lump sum in respect of their benefits in the Plan. The result of this exercise was that lump sums totalling \$2.7 million were paid out with a corresponding \$3.6 million of defined benefit obligation being extinguished. This triggered immediate recognition of the unamortized net actuarial losses of \$0.8 million.

In October 2018, following a High Court ruling in the U.K., a \$2.2 million allowance in relation to the expected future costs of equalizing Guaranteed Minimum Pensions (GMPs) in the U.K. Plan has been included in the obligations on the balance sheet at December 31, 2018. This allowance is being amortized in the income statement over the future lifetime of the Plan members.

The fair value of plan assets were:

<i>In millions</i>	2019 U.K.	2019 U.S./ other	2019 Total	2018 U.K.	2018 U.S./ other	2018 Total
Assets in active markets:						
Equities and growth funds	\$ 146.8	\$ 26.2	\$ 173.0	\$ 173.1	\$ 20.6	\$ 193.7
Government bonds	52.7	—	52.7	46.7	—	46.7
Corporate bonds	129.1	16.2	145.3	63.6	18.0	81.6
Cash	0.1	—	0.1	—	—	—
Total fair value of plan assets	<u>\$ 328.7</u>	<u>\$ 42.4</u>	<u>\$ 371.1</u>	<u>\$ 283.4</u>	<u>\$ 38.6</u>	<u>\$ 322.0</u>

All investments were classified as Level 2 in the fair value hierarchy as of December 31, 2019 and December 31, 2018.

The following benefit payments are expected to be paid by the plans for the years ended December 31 as follows:

<i>In millions</i>	U.K. pension plans	U.S./ other pension plans
2020	\$ 14.9	\$ 2.4
2021	15.2	2.4
2022	15.6	2.4
2023	15.9	2.4
2024	16.3	2.4
Thereafter	<u>\$ 85.3</u>	<u>\$ 11.8</u>

The estimated amount of employer contributions expected to be paid to the defined benefit pension plans for the year ending December 31, 2020, is \$7.9 million (2019: \$7.9 million actual employer contributions).

14. Shareholders' Equity

(a) Ordinary share capital

	December 31, 2019	December 31, 2018	December 31, 2019	December 31, 2018
	No.	No.	Millions	Millions
Authorized:				
Ordinary shares of £0.50 each	40,000,000	40,000,000	\$ 35.7 ⁽¹⁾	\$ 35.7 ⁽¹⁾
Deferred ordinary shares of £0.0001 each	761,835,338,444	761,845,318,444	149.9 ⁽¹⁾	149.9 ⁽¹⁾
	<u>761,875,338,444</u>	<u>761,885,318,444</u>	<u>\$ 185.6 ⁽¹⁾</u>	<u>\$ 185.6 ⁽¹⁾</u>
Allotted, called up and fully paid:				
Ordinary shares of £0.50 each	29,000,000	29,000,000	\$ 26.6 ⁽¹⁾	\$ 26.6 ⁽¹⁾
Deferred ordinary shares of £0.0001 each	761,835,338,444	761,835,338,444	149.9 ⁽¹⁾	149.9 ⁽¹⁾
	<u>761,864,338,444</u>	<u>761,864,338,444</u>	<u>\$ 176.5 ⁽¹⁾</u>	<u>\$ 176.5 ⁽¹⁾</u>

(1) The Company's ordinary and deferred share capital are shown in U.S. dollars at the exchange rate prevailing at the month-end spot rate at the time of the share capital being issued. This rate at the end of February 2007 was \$1.9613:£1 when the first 20,000,000 shares were issued; the rate at the end of October 2012 was \$1.6129:£1 when 7,000,000 shares were issued; the rate at the end of March 2013 was \$1.5173:£1 when 1,924 shares were issued; the rate at the end of January 2014 was \$1.6487:£1 when 12,076 shares were issued; the rate at the end of May 2014 was \$1.6760:£1 when 24,292 shares were issued; the rate at the end of August 2014 was \$1.6580:£1 when 58,399 shares were issued; the rate at the end of February 2015 was \$1.5436:£1 when 8,563 shares were issued; the rate at the end of March 2015 was \$1.4847:£1 when 3,866 shares were issued; the rate at the end of June 2015 was \$1.5715:£1 when 27,679 shares were issued; and the rate at the end of August 2018 when was \$1.2843:£1 when 1,863,201 shares were issued.

The rights of the shares are as follows:

Ordinary shares of £0.50 each

The ordinary shares carry no entitlement to an automatic dividend but rank *pari passu* in respect of any dividend declared and paid. The ordinary shares were allotted and issued to satisfy share awards which vested under the Company's share award and share incentive plans.

At December 31, 2019, there were 27,431,283 (2018: 28,376,729) ordinary shares of Luxfer Holdings PLC listed on the New York Stock Exchange (NYSE).

Deferred ordinary shares of £0.0001 each

The deferred shares have no entitlement to dividends or to vote. On a liquidation, (but not otherwise) the holders of the deferred shares shall be entitled to the repayment of the paid up nominal amount of the deferred shares, but only after any payment to the holders of ordinary shares of an amount equal to 100 times the amount paid up on such ordinary shares.

14. Shareholders' Equity (continued)

(b) Treasury Shares

In millions

At January 1, 2018	\$ (5.8)
Transfer of treasury shares into ESOP	1.4
Utilization of treasury shares	0.1
At December 31, 2018	(4.3)
Utilization of treasury shares	0.3
At December 31, 2019	\$ (4.0)

In June 2015, the Board announced a share buy-back program of up to \$10 million to cover the needs of employee share plans. Shareholder approval for this program was granted at the 2014 Annual General Meeting (for repurchases up to an aggregate amount of 2,700,000 ordinary shares or ADSs).

During 2018 and 2019, no ordinary shares were repurchased under the share buy-back program. At December 31, 2019, there were 352,499 (2018: 378,201) treasury shares held at a cost of \$4.0 million (2018: \$4.3 million).

(c) Own shares held by ESOP

In millions

At January 1, 2018	\$ (1.0)
Issue of new shares	(1.3)
Shares sold from ESOP	0.4
Transfer of treasury shares into ESOP	(1.4)
Utilization of ESOP shares	1.1
At December 31, 2018	(2.2)
Shares sold from ESOP	0.2
Utilization of ESOP shares	0.3
At December 31, 2019	\$ (1.7)

At December 31, 2019, there were 1,216,220 ordinary shares of £0.50 each (2018: 1,621,301 ordinary shares of £0.50 each) held by The Luxfer Group Employee Share Ownership Plan (the "ESOP").

14. Shareholders' Equity (continued)

(d) Dividends paid and proposed

<i>In millions</i>	2019	2018	2017
Dividends declared and paid during the year:			
Interim dividend paid February 1, 2017 (\$0.125 per ordinary share)	—	—	3.3
Interim dividend paid May 3, 2017 (\$0.125 per ordinary share)	—	—	3.3
Interim dividend paid August 2, 2017 (\$0.125 per ordinary share)	—	—	3.3
Interim dividend paid November 1, 2017 (\$0.125 per ordinary share)	—	—	3.4
Interim dividend paid February 7, 2018 (\$0.125 per ordinary share)	—	3.4	—
Interim dividend paid May 2, 2018 (\$0.125 per ordinary share)	—	3.3	—
Interim dividend paid August 1, 2018 (\$0.125 per ordinary share)	—	3.3	—
Interim dividend paid November 7, 2018 (\$0.125 per ordinary share)	—	3.4	—
Interim dividend paid February 6, 2019 (\$0.125 per ordinary share)	3.4	—	—
Interim dividend paid May 1, 2019 (\$0.125 per ordinary share)	3.4	—	—
Interim dividend paid August 7, 2018 (\$0.125 per ordinary share)	3.4	—	—
Interim dividend paid November 6, 2019 (\$0.125 per ordinary share)	3.4	—	—
	<u>\$ 13.6</u>	<u>\$ 13.4</u>	<u>\$ 13.3</u>

<i>In millions</i>	2019	2018	2017
Dividends declared and paid after December 31 (not recognized as a liability at December 31):			
Interim dividend paid February 7, 2018: (\$0.125 per ordinary share)	\$ —	\$ —	\$ 3.4
Interim dividend paid February 6, 2019: (\$0.125 per ordinary share)	—	3.4	—
Interim dividend paid February 5, 2020: (\$0.125 per ordinary share)	3.4	—	—
	<u>\$ 3.4</u>	<u>\$ 3.4</u>	<u>\$ 3.4</u>

15. Share Plans

(a) *The Luxfer Group Employee Share Ownership Plan*

The trust

In 1997, the Company established an employee benefit trust ("the ESOP") with independent Trustees, to purchase and hold shares in the Company in trust to be used to satisfy options granted to eligible senior employees under the Company's share plans established from time to time.

The ESOP was established with the benefit of a gift equivalent to the set up and running costs. Purchase monies and costs required by the ESOP Trustees to purchase shares for and under the provisions of the trust are provided by way of an interest free loan from a Company subsidiary. The loan is repayable, in normal circumstances, out of monies received from senior employees when they exercise options granted to them over shares. Surplus shares are held by the ESOP Trustees to satisfy future option awards. The ESOP Trustees have waived their right to receive dividends on shares held in trust. The Remuneration Committee is charged with determining which senior employees are to be granted options and in what number subject to the relevant plan rules.

The current plan

The current share option plan, implemented by the Company in February 2007 is The Luxfer Holdings Executive Share Option Plan ("the Plan"), which consists of two parts. Part A of the Plan is approved by HM Revenue & Customs and Part B is unapproved. Options can be exercised at any time up to the tenth anniversary of their grant subject to the rules of the relevant part of the Plan. As a result of the Company's initial public offering of ordinary shares in 2012, all leaver restrictions over the shares were released. There are no other performance criteria attached to the options.

Changes in the year

The change in the number of shares held by the Trustees of the ESOP and the number of share options held over those shares are shown below:

	Number of shares held by ESOP Trustees	
	£0.0001 deferred shares	£0.50 ordinary shares
At January 1, 2019	15,977,968,688	1,621,301
Shares utilized during the year	—	(253,881)
Shares sold from the ESOP during the year	—	(151,200)
At December 31, 2019	15,977,968,688	1,216,220

At December 31, 2019, the loan outstanding from the ESOP was \$0.6 million (2018: \$2.0 million).

The market value of each £0.50 ordinary share held by the ESOP at December 31, 2019, was \$18.51 (2018: \$17.63).

(b) ***Share-based compensation***

Luxfer Holdings PLC Long-Term Umbrella Incentive Plan and Luxfer Holdings PLC Non-Executive Directors Equity Incentive Plan

As an important retention tool and to align the long-term financial interests of our management with those of our shareholders, the Company adopted the Luxfer Holdings PLC Long-Term Umbrella Incentive Plan (the "LTIP") for the Company's senior employees, and the Luxfer Holdings PLC Non-Executive Directors Equity Incentive Plan (the "Director EIP") for the Non-Executive Directors.

15. Share Plans (continued)

(b) *Share-based compensation (continued)*

The equity or equity-related awards under the LTIP and the Director EIP are based on the ordinary shares of the Company. The Remuneration Committee administers the LTIP and has the power to determine to whom the awards will be granted, the amount, type and other terms. Awards granted under the LTIP generally vest one-third each year over a three-year period, subject to continuous employment and certain other conditions, with the exercise period expiring five years after grant date. Awards granted under the Director EIP are non-discretionary, are purely time-based and vest over one year, with settlement occurring immediately on vesting.

Share option and restricted stock awards

In March 2019, a combined 196,320 of Restricted Stock Units and Options over ordinary shares were granted under the LTIP, which were all time-based awards vesting over four years and expiring two years later. In May 2019, a combined 3,981 of Restricted Stock Units and Options over ordinary shares were granted under the Director EIP, which were all time-based awards that would fully vest one year later. In December 2019, a combined 6,000 of Restricted Stock Units and Options over ordinary shares were granted under the LTIP, which were all time-based awards vesting over four years and expiring two years later.

In March 2018, a combined 432,600 of Restricted Stock Units and Options over ordinary shares were granted under the LTIP, which were all time-based awards vesting over three years and expiring two years later. In April 2018, a combined 11,936 of Restricted Stock Units and Options over ordinary shares were granted under the Director EIP, of which 2,000 would vest over three years and 9,936 would fully vest one year later. The Director EIP are all time-based awards.

In January 2018, Heather Harding was granted share options in respect of her appointment to the role of Chief Financial Officer. These time, and performance-based options were outside the terms of reference of the LTIP but granted in accordance with the provisions of the Remuneration Policy. The details of the awards are as follows:

The Remuneration Committee determined that the new Chief Financial Officer should acquire 21,000 nominal cost RSUs to vest over three years.

Performance-based awards amounting to 30,000 shares should be made to the new Chief Financial Officer which would vest upon achievement of attaining a specified adjusted diluted EPS target at each annual measurement date. Three levels of target were set:

- The lower target must be achieved by the measurement date at the end of 2020 and will result in the vesting of 5,000 shares.
- The mid-point target must be achieved by the measurement date at the end of 2022 and will result in the vesting of a further 10,000 shares.
- The top target must be achieved by the measurement date at the end of 2024 and will result in the vesting of a further 15,000 shares.

These awards have vested in full at the maximum level as all performance criteria were confirmed as having been met by the Remuneration Committee in the first quarter of 2019.

In March 2017, a combined 139,800 of Restricted Stock Units and Options over ordinary shares were granted under the LTIP, which were all time-based awards vesting over three years and expiring two years later. Following the Annual General Meeting on May 23, 2017, a combined 21,814 of Restricted Stock Units and Options over ordinary shares were granted under the Director EIP, which were all time-based awards which will be fully vested and settled one year later in May 2018.

15. Share Plans (continued)

(b) Share-based compensation (continued)

In May 2017 Alok Maskara was granted share options in respect of his appointment to the role of Chief Executive Officer. These time, and performance-based options were outside the terms of reference of the LTIP but granted in accordance with the provisions of the Remuneration Policy. The details of the awards are as follows:

- (i) The Remuneration Committee determined that the new Chief Executive Officer should acquire a minimum quantity of 22,500 shares within twelve months of appointment. Upon the Chief Executive Officer acquiring the shares, the Company matched the purchase by granting an award over 45,000 nominal cost RSUs, to vest over three years.
- (ii) A one-off share award to the new CEO, outside the terms of the LTIP, over 60,000 time-based nominal cost RSUs, to vest over four years.
- (iii) Performance-based Awards made to the new Chief Executive Officer vest upon achievement of attaining a specified adjusted diluted EPS target at each annual measurement date. Three levels of targets were set:
 - The lower target must be achieved by the measurement date at the end of 2020 and will result in the vesting of 30,000 shares.
 - The mid-point target must be achieved by the measurement date at the end of 2022 and will result in the vesting of a further 40,000 shares.
 - The top target must be achieved by the measurement date at the end of 2024 and will result in the vesting of a further 50,000 shares.

These awards have vested in full at the maximum level as all performance criteria were confirmed as having been met by the Remuneration Committee in the first quarter of 2019.

Total share-based compensation expense for 2019, 2018 and 2017 was as follows:

<i>In millions</i>	Years ended December 31,		
	2019	2018	2017
Other share-based compensation charges	\$ 4.5	\$ 4.8	\$ 2.2
Restructuring share-based compensation charges	—	—	0.9
Total share-based compensation charges	\$ 4.5	\$ 4.8	\$ 3.1

There were no cancellations or modifications to the awards in 2019, 2018 or 2017.

Cash received from option exercises for the years ended December 31, 2019, 2018 and 2017 was \$0.5 million, \$0.5 million and \$0.9 million, respectively. The actual tax benefit realized for the tax deductions from option exercises totaled \$0.9 million, \$0.2 million and \$0.3 million in 2019, 2018 and 2017, respectively.

The following tables illustrates the number of, and movements in, share options during the year, with each option relating to 1 ordinary share:

	Number of shares	Weighted-average exercise price	Weighted-average remaining contractual life (years)	Aggregate intrinsic value (\$M)
At January 1, 2019	849,064	\$ 2.10	1.9	\$ 13.3
Granted during the year	212,419	\$ 0.90		
Exercised during the year	(491,216)	\$ 2.65		
Accrued dividend awards	13,838	\$ 0.72		
Lapsed during the year	(116,743)	\$ 2.43		
At December 31, 2019	467,362	\$ 0.75	1.7	\$ 8.7
Options exercisable at December 31, 2019	8,903	\$ 0.66	2.1	\$ 0.2
Options expected to vest as of December 31, 2019	458,459	\$ 0.75	1.7	\$ 8.5

15. Share Plans (continued)

(b) *Share-based compensation (continued)*

The weighted average fair value of options granted in 2019, 2018 and 2017 was estimated to be \$17.65, \$11.02 and \$9.82 per share, respectively. The total intrinsic value of options that were exercised during 2019, 2018 and 2017 was \$11.2 million, \$9.3 million and \$1.4 million, respectively. At December 31, 2019, the total unrecognized compensation cost related to share options was \$2.7 million (2018: \$3.8 million). This cost is expected to be recognized over a weighted average period of 1.3 years (2018: 1.8 years).

The following table illustrates the assumptions used in deriving the fair value of share options during the year:

	2019	2018	2017
Dividend yield (%)	2.10	4.00	4.00
Expected volatility range (%)	35.06 - 44.20	22.65 - 35.77	26.81 - 35.81
Risk-free interest rate (%)	0.74 - 2.52	0.12 - 2.57	1.00 - 2.01
Expected life of share options range (years)	0.50 - 4.00	0.50 - 6.00	0.50 - 7.36
Forfeiture rate (%)	5.00	5.00	5.00
Weighted average exercise price (\$)	\$1.00	\$0.65	\$0.65
Models used	Black-Scholes & Monte-Carlo	Black-Scholes & Monte-Carlo	Black-Scholes

The expected life of the share options is based on historical data and current expectations and is not necessarily indicative of exercise patterns that may occur. The expected volatility reflects the assumption that the historical volatility over a period similar to the life of the options is indicative of future trends, which may not necessarily be the actual outcome.

Employee share incentive plans

The Company operates an all-employee share incentive plan in its U.K. and U.S. operations and may look to implement plans in other geographic regions.

16. Segmental Information

We classify our operations into two core business segments, Gas Cylinders and Elektron, based primarily on shared economic characteristics for the nature of the products and services; the nature of the production processes; the type or class of customer for their products and services; the methods used to distribute their products or provide their services; and the nature of the regulatory environment. The Company has six identified business units, which aggregate into the two reportable segments. Luxfer Gas Cylinders and Luxfer Superform aggregate into the Gas Cylinders segment, and Luxfer MEL Technologies, Luxfer Magtech, Luxfer Graphic Arts and Luxfer Czech Republic⁽¹⁾ aggregate into the Elektron segment. A summary of the operations of the segments is provided below:

Gas Cylinders segment

Our Gas Cylinders segment manufactures and markets specialized products using aluminum, titanium and carbon composites, including pressurized cylinders for use in various applications including self-contained breathing apparatus (SCBA) for firefighters, containment of oxygen and other medical gases for healthcare, alternative fuel vehicles, and general industrial. The segment also forms lightweight aluminum and titanium panels into highly complex shapes that are used mainly in the transportation industry.

Elektron segment

Our Elektron segment focuses on specialty materials based primarily on magnesium and zirconium, with key product lines including advanced lightweight magnesium alloys with a variety of uses across a variety of industries; magnesium powders for use in countermeasure flares, as well as heater meals; photoengraving plates for graphic arts; and high-performance zirconium-based materials and oxides used as catalysts and in the manufacture of advanced ceramics, fiber-optic fuel cells, and many other performance products.

Other

Other primarily represents unallocated corporate expense and includes non-service related defined benefit pension cost / credit and, in 2017, the cost of converting our ADR structure to a direct listing of our ordinary shares.

Management monitors the operating results of its reportable segments separately for the purpose of making decisions about resource allocation and performance assessment. Segment performance is evaluated by the chief operating decision maker, who is responsible for allocating resources and assessing performance of the operating segments and has been identified as the CEO, using adjusted EBITA⁽²⁾ and adjusted EBITDA, which is defined as segment income and is based on operating income adjusted for share based compensation charges; loss on disposal of property, plant and equipment, restructuring charges; impairment charges; acquisition and disposal related gains and costs; other charges; depreciation and amortization; and unwind of discount on deferred consideration.

Unallocated assets and liabilities include those which are held on behalf of the Company and cannot be allocated to a segment, such as taxation, investments, cash, retirement benefits obligations, bank and other loans and holding company assets and liabilities.

Financial information by reportable segment for the years ended December 31, is included in the following summary:

<i>In millions</i>	Net Sales			Adjusted EBITDA		
	2019	2018	2017	2019	2018	2017
Gas Cylinders segment	\$ 223.6	\$ 238.1	\$ 220.2	\$ 23.3	\$ 23.4	\$ 17.0
Elektron segment	219.9	249.8	221.1	44.8	56.2	42.3
Consolidated	\$ 443.5	\$ 487.9	\$ 441.3	\$ 68.1	\$ 79.6	\$ 59.3

During 2019, 2018 and 2017 there were \$0.4 million of sales made from the Elektron segment to the Gas Cylinders segment.

<i>In millions</i>	Depreciation and amortization			Restructuring Charges		
	2019	2018	2017	2019	2018	2017
Gas Cylinders segment	\$ 5.7	\$ 7.3	\$ 7.2	\$ 20.7	\$ 10.0	\$ 2.9
Elektron segment	9.6	11.7	11.1	5.2	3.4	5.5
Consolidated	\$ 15.3	\$ 19.0	\$ 18.3	\$ 25.9	\$ 13.4	\$ 8.4

⁽¹⁾ The Luxfer Czech Republic business unit was sold at the end of the Second Quarter of 2019.

⁽²⁾ Adjusted EBITA is adjusted EBITDA less depreciation and loss on disposal of property, plant and equipment.

16. Segmental Information (continued)

<i>In millions</i>	Total assets			Capital expenditure		
	2019	2018	2017	2019	2018	2017
Gas Cylinders segment	\$ 156.0	\$ 157.0	\$ 156.9	\$ 3.9	\$ 2.8	\$ 3.5
Elektron segment	200.8	217.5	210.4	10.9	10.5	5.8
Other	33.5	34.3	48.5	—	0.3	0.7
	\$ 390.3	\$ 408.8	\$ 415.8	\$ 14.8	\$ 13.6	\$ 10.0

The following table presents a reconciliation of Adjusted EBITDA to net income:

<i>In millions</i>	2019	2018	2017
Adjusted EBITDA	\$ 68.1	\$ 79.6	\$ 59.3
Other share based compensation charges	(4.5)	(4.8)	(2.2)
Loss on disposal of property, plant and equipment	(0.2)	(0.3)	—
Depreciation and amortization	(15.3)	(19.0)	(18.3)
Unwind discount on deferred consideration	(0.2)	(0.2)	(0.2)
Restructuring charges	(25.9)	(13.4)	(8.4)
Impairment charge	(5.0)	(7.2)	(3.7)
Acquisition (costs) / credit	(1.4)	(4.3)	1.3
Other charges	(2.5)	—	(5.8) ⁽¹⁾
Defined benefits pension mark-to-market gain	1.3	4.7	4.2
Interest expense, net	(4.6)	(4.6)	(6.3)
Provision for taxes	(6.7)	(5.5)	(3.3)
Net income	\$ 3.1	\$ 25.0	\$ 16.6

⁽¹⁾ Other charges in 2017 include costs incurred on: settlement and other legal expenses incurred in relation to patent infringement litigation against a competitor; and costs incurred in relation to the conversion of the Company's ADR listing to a direct listing of ordinary shares on the New York Stock Exchange.

Equity income of unconsolidated affiliates for 2019, 2018 and 2017 relates predominantly to the Gas Cylinders Segment.

16. Segmental Information (continued)

The following tables present certain geographic information by geographic region for the years ended December 31,:

	Net Sales ⁽¹⁾					
	2019		2018		2017	
	\$M	Percent	\$M	Percent	\$M	Percent
United States	\$ 239.4	54.0%	\$ 249.2	51.1%	\$ 224.1	50.8%
U.K.	35.5	8.0%	47.6	9.8%	40.4	9.2%
Germany	22.0	5.0%	42.0	8.6%	36.8	8.3%
Italy	22.6	5.1%	23.3	4.8%	19.0	4.3%
France	16.5	3.7%	17.0	3.4%	16.0	3.6%
Top five countries	\$ 336.0	75.8%	\$ 379.1	77.7%	\$ 336.3	76.2%
Rest of Europe	38.4	8.7%	33.2	6.8%	31.1	7.0%
Asia Pacific	47.6	10.7%	53.0	10.9%	47.5	10.8%
Other ⁽²⁾	21.5	4.8%	22.6	4.6%	26.4	6.0%
	\$ 443.5		\$ 487.9		\$ 441.3	

<i>In millions</i>	Property, plant and equipment, net		
	2019	2018	2017
United States	\$ 57.3	\$ 66.1	\$ 75.4
United Kingdom	36.7	36.0	36.6
Rest of Europe	1.0	1.1	13.1
Asia Pacific	0.3	0.3	0.2
Other ⁽²⁾	3.6	3.4	3.8
	\$ 98.9	\$ 106.9	\$ 129.1

(1) Net sales are based on the geographic destination of sale.

(2) Other includes Canada, South America, Latin America and Africa.

17. Leases

We have operating leases for buildings, vehicles and certain equipment. The majority of our leases have remaining lease terms of one to nine years, with one building having 54 years remaining.

The components of the lease expense is as follows:

<i>In millions</i>	Year to date		
	2019	2018	2017
Operating lease cost	\$ 4.1	\$ 4.8	\$ 5.1

None of our leases were classified as finance leases in any of the years disclosed.

Supplemental cash flow information related to leases was as follows:

<i>In millions</i>	Year-to-date		
	2019	2018	2017
Operating cash flows from operating leases	\$ 4.1	\$ 4.8	\$ 5.1

Supplemental balance sheet information related to leases was as follows:

<i>In millions</i>	December 31,	
	2019	2018
Operating leases		
Operating lease right-of-use asset	\$ 14.8	\$ 18.4
Other current liabilities	3.3	3.5
Other non-current liabilities	11.7	14.9
	\$ 15.0	\$ 18.4
Weighted Average Remaining Lease Term (Years)	16.2	14.6
Weighted Average Discount Rate	4.46%	4.46%

Maturities of lease liabilities were as follows:

<i>In millions</i>	2019
2020	\$ 3.9
2021	3.2
2022	2.2
2023	1.6
2024	1.2
Thereafter	9.9
Total lease payments	\$ 22.0
Less imputed interest	(7.0)
Total	\$ 15.0

18. Commitments and Contingencies

Capital commitments

At December 31, 2019, the Company had capital expenditure commitments of \$1.0 million (2018: \$2.5 million and 2017: \$0.6 million) for the acquisition of new plant and equipment.

Committed banking facilities

At December 31, 2019 and 2018 the Company had committed banking facilities of \$150.0 million. The facilities were for providing loans, with a separate facility for letters of credit which at December 31, 2019, was £1.0 million (\$1.3 million), 2018 was £7.0 million (\$8.9 million). Of the committed facilities, \$17.5 million was drawn, no loans were drawn and no letters of credit were utilized at December 31, 2019, \$3.5 million, nil and nil for 2018. The Company also has two separate bonding facilities for bank guarantees, one denominated in GBP sterling of £4.5 million (\$5.9 million), 2018:£3.0 million (\$3.8 million), of which £1.5 million (\$2.3 million) (2018: £1.5 million / \$1.9 million) was utilized at December 31, 2019 and one denominated in USD of \$0.4 million which was fully utilized at December 31, 2019.

Contingencies

During February 2014, a cylinder was sold to a long-term customer and ruptured at one of their gas facilities. As a result of this rupture, three people were noted to have minor injuries such as loss of hearing. There was no major damage to assets of the customer. A claim has been launched by the three people who were injured in the incident. We have reviewed our quality control checks from around the time which the cylinder was produced and no instances of failures have been noted. It has also been noted by the investigator that the customer has poor quality and safety checks. As a result we do not believe that we are liable for the incident, and therefore, do not currently expect this case to have a material impact on the Company's financial position or results of operations.

19. Selected Quarterly Data (unaudited)

The following tables present 2019 and 2018 quarterly financial information:

<i>In millions, except per-share data</i>	2019				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Full Year
Net sales	\$ 120.4	\$ 116.5	\$ 107.1	\$ 99.5	\$ 443.5
Gross profit	30.1	31.0	25.2	21.7	108.0
Operating (loss) / income	(1.1)	5.2	6.6	1.7	12.4
Net (loss) / income	(3.8)	3.5	5.8	(2.4)	3.1
(Loss) / earnings per ordinary share⁽¹⁾					
Basic (loss) / earnings per ordinary share	\$ (0.14)	\$ 0.13	\$ 0.21	\$ (0.09)	\$ 0.11
Diluted (loss) / earnings per ordinary share	(0.14)	0.13	0.21	(0.09)	0.11

<i>In millions, except per-share data</i>	2018				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Full Year
Net sales	\$ 119.7	\$ 128.2	\$ 129.1	\$ 110.9	\$ 487.9
Gross profit	30.3	33.6	34.0	24.2	\$ 122.1
Operating income / (loss)	12.8	14.6	15.7	(13.1)	\$ 30.0
Net income / (loss)	9.9	11.4	12.2	(8.5)	\$ 25.0
Earnings / (loss) per ordinary share⁽¹⁾					
Basic earnings / (loss) per ordinary share	\$ 0.37	\$ 0.43	\$ 0.46	\$ (0.31)	\$ 0.94
Diluted earnings / (loss) per ordinary share	0.36	0.42	0.44	(0.31)	0.90

(1) 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 the period.

Fourth quarter 2019 included decreases in operating income due to restructuring charges of \$1.6 million and impairment charges of \$5.2 million.

20. Related-Party Transactions

Joint venture in which the Company is a venturer

During 2019, the Company maintained its 51% investment in the equity of the joint venture, Luxfer Uttam India Private Limited. During 2019, the Gas Cylinders segment made \$6.4 million (2018: \$1.7 million) of sales to the joint venture. At December 31, 2019, the gross amounts receivable from the joint venture amounted to \$2.9 million (2018: \$1.1 million) and the net amounts receivable amounted to \$2.7 million (2018: \$0.9 million).

In addition, in 2018 we have transferred goods to Luxfer Uttam on extended credit terms with a sales value of \$1.6 million, where we did not deem it to be probable that we would collect substantially all of the consideration. In accordance with ASC 606, *Revenue from Contracts with Customers*, we did not recognize any revenue in relation to this transaction in 2018, however, this revenue was recognized, in full, during 2019.

During 2019, the Company also maintained its 50% investment in the equity of the joint venture, Nikkei-MEL Company Limited. During 2019, the Elektron segment made \$0.7 million of sales to the joint venture (2018: \$0.9 million). At December 31, 2019, the gross and net amounts receivable from the joint venture amounted to \$0.1 million (2018: nil)

The Company held 49% of the equity in Luxfer Holdings NA, LLC up to December 28, 2018, after which the company acquired the remaining 51% equity stake with the entity fully consolidated at December 31, 2018 (see note 2 *Acquisitions and Disposals*). During 2018 the Company made \$0.6 million of sales to the joint venture and received \$0.4 million interest income. All sales to the joint venture are made on similar terms to arm's length transactions.

Associates in which the Company holds an interest

During 2019 the Company maintained its 26.4% equity of the associate, Sub161 Pty Limited. During 2019, the Company made \$nil sales (2018: \$nil) to the associate. At December 31, 2019, the amounts receivable from the associate denominated in Australian dollars was \$nil (2018: \$nil).

Transactions with other related parties

At December 31, 2019, the directors and key management comprising the members of the Executive Leadership Team, owned 377,424 £0.50 ordinary shares (2018: 237,161 £0.50 ordinary shares) and held awards over a further 302,752 £0.50 ordinary shares (2018: 600,528 £0.50 ordinary shares).

During the years ended December 31, 2019 and December 31, 2018, share options held by members of the Executive Leadership Team were exercised.

Cherokee Properties Inc. represents a related party due to its association with Chris Barnes, who was until July 2019 the president of one of our operating segments and is the president of Cherokee Properties Inc. During 2019, we engaged with Cherokee Properties Inc. for rental and associated costs regarding our manufacturing site in Madison, IL, for the value of \$1.1 million (2018: \$1.0 million).

Other than the transactions with the joint ventures and associates disclosed above and key management personnel disclosed above, no other related-party transactions have been identified.

21. Subsequent Events

No material subsequent events

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 for the period covered by this report, 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 not effective as of December 31, 2019, as a result of the material weakness described below.

In light of the material weakness described below, the Company performed additional analysis and other post-closing procedures to ensure our consolidated financial statements are prepared in accordance with generally accepted accounting principles. Our management, including our Chief Executive Officer and our Chief Financial Officer, has concluded that our consolidated financial statements for the periods covered by and included in this Annual Report on Form 10-K are fairly presented in all material respects in accordance with accounting principles generally accepted in the United States of America (GAAP) for the periods presented herein.

Implementation of new ERP system

In October 2019, the Company implemented a new ERP system in the Luxfer MEL Technologies business unit within the Elektron segment. As a result of the newly implemented ERP, which replaced two legacy ERP systems, management had to design, implement and operate new information technology ("IT") general controls and process-level controls and make changes to existing process-level controls during the fourth quarter.

As a result of the new ERP system implementation in the fourth quarter, there were control deficiencies identified that led to the material weakness, described below.

Management's Annual Report on Internal Control Over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting for the Company as defined in Rules 13a-15(f) or 15d-15(f) under the Exchange Act. Our 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 accounting principles generally accepted in the United States of America. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements.

Management, with the participation of our Chief Executive Officer and our Chief Financial Officer, has performed an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2019, based on the framework and criteria established in Internal Control - Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework). Based on this evaluation, and as a result of the material weakness described below, management has concluded that our internal control over financial reporting was not effective as of December 31, 2019.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of our annual or interim financial statements will not be prevented or detected on a timely basis.

The Company determined that the following deficiencies in its internal control over financial reporting in relation to the Luxfer MEL Technologies business unit, in combination, constitute a material weakness.

The Company did not maintain effective controls over certain IT general controls for the new ERP system. Specifically, the Company did not (a) adequately tailor privileged access to the financial application, programs, and data or sufficiently evidence the monitoring of such access; (b) adequately approve exceptions to segregation of duties in respect of the ability to develop and implement changes to the IT production environment; and (c) ensure that it appropriately used complete and accurate information in performing monitoring and oversight controls. In addition, as a consequence of the implementation of the new ERP system, the Company did not design, implement and consistently operate effectively certain process-level controls in the fourth quarter in respect of the appropriate recording, accounting, and review of certain transactions and accounts; and ensure the completeness and accuracy of system-generated information used in performing certain IT-dependent manual controls.

While the control deficiencies did not result in any material misstatement of the Company's financial statements, the Company's management concluded that, as these deficiencies, in combination, potentially could result in a material misstatement, these deficiencies, in combination, represent a material weakness.

PricewaterhouseCoopers LLP, an independent registered public accounting firm, has provided an attestation report which is included herein on the Company's internal control over financial reporting. The Company's financial statements included in this Annual Report on Form 10-K also have been audited by PricewaterhouseCoopers LLP.

Plan for Remediation of Material Weakness in Internal Control Over Financial Reporting

The Company is developing and implementing plans to address the material weakness discussed above. Our management, with oversight from the Audit Committee, has taken immediate action to begin remediating the material weakness identified. While certain remedial actions have been initiated, we continue to actively plan for and implement additional control procedures. These remediation efforts, outlined below, are intended to address the identified material weakness:

- implement enhanced controls to monitor and document privileged access to, and segregation of duties within, the ERP system;
- update the design of certain process-level controls and effectively operating them as re-designed;
- effectively operate the process-level controls which were designed appropriately; and
- implement any additional reviews, controls and procedures that may be required to remediate the material weakness.

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

Other than the changes to controls arising from the implementation of the new ERP system, as described above, there was no other change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) that occurred during the quarter ended December 31, 2019 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this Item is incorporated by reference to the following sections of our definitive Proxy Statement related to the 2020 Annual General Meeting to be filed with the SEC not later than 120 days after the end of the fiscal year covered by this annual report, (the "2020 Proxy Statement"): "Resolutions 1 - 5 - Election and Re-Election of Director Nominees," "Corporate Governance Matters" and "Section 16(a) Beneficial Ownership Reporting Compliance."

The Company has adopted a code of ethics which is applicable to all employees and is available on the corporate website, www.luxfer.com. A copy of the code can also be obtained, without charge, upon request. If there is an amendment to the code, then the nature of the amendment will also be made available of the corporate website.

Item 11. Executive Compensation

The information required by this Item is incorporated by reference to the following sections of the Proxy Statement for the 2020 annual general meeting: "Executive Compensation Discussion and Analysis" and "Director Compensation".

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

The information required by this Item is incorporated by reference to the following sections of the Proxy Statement for the 2020 annual general meeting: "Equity Compensation Plan Information" and "Security Ownership."

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

The information required by this Item is incorporated by reference to the following sections of the Proxy Statement for the 2020 annual general meeting: "Policies and Procedures Regarding Conflicts of Interest and Related Party Transactions" and "Corporate Governance Matters."

Item 14. Principal Accountant Fees and Services

The information required by this Item is incorporated by reference to the following section of the Proxy Statement for the 2020 annual general meeting: "Resolution 9 - Ratification of the appointment of PricewaterhouseCoopers LLP as the independent auditors of Luxfer Holdings PLC for 2020, and to authorize, by binding vote, the Audit Committee to set the auditors' remuneration".

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a)(1) Financial Statements

The Financial Statements listed in the Index to Financial Statements in Item 8 are filed as part of this Annual Report on Form 10-K.

(a)(2) Financial Statement Schedules

N/A

(a)(3) Exhibits

- 3.1 [Articles of Association of the Registrant, initially filed with the SEC on December 2, 2011 and as amended on May 22, 2018 and as amended on May 15, 2019](#)
- 4.1 [Form of specimen certificate evidencing ordinary shares \(incorporated by reference to Exhibit 4.1 to our Registration Statement on Form F-1 \(file no. 333-178278\), as amended, initially filed with the SEC on December 2, 2011\)](#)
- 10.1 [Amended and Restated Note Purchase Agreement dated as of June 29, 2016 by and among BA Holdings, Inc. and the parties named therein \(incorporated by reference to Exhibit 2.3 to our Annual Report on Form 20-F \(file no. 001-35370\), initially filed with the SEC on March 19, 2018\)](#)
- 10.2 [Senior Facilities Agreement dated as of May 13, 2011, as amended and restated on July 31, 2017 by and among Luxfer Holdings PLC and the parties named therein \(incorporated by reference to Exhibit 2.4 to our Annual Report on Form 20-F \(file no. 001-35370\), initially filed with the SEC on March 19, 2018\)](#)
- 10.3 [First Amendment to Amended and Restated Note Purchase Agreement dated as of March 13, 2017 by and among Luxfer Holdings PLC and the parties named therein \(incorporated by reference to Exhibit 2.5 to our Annual Report on Form 20-F \(file no. 001-35370\), initially filed with the SEC on March 19, 2018\)](#)
- 10.4 [Amended and Restated Note Purchase and Private Shelf Agreement dated as of June 29, 2016 by and among Luxfer Holdings PLC and the parties named therein \(incorporated by reference to Exhibit 2.6 to our Annual Report on Form 20-F \(file no. 001-35370\), initially filed with the SEC on March 19, 2018\)](#)
- 10.5 [First Amendment to Amended and Restated Note Purchase Agreement and Private Shelf Agreement dated as of March 13, 2017 by and among Luxfer Holdings PLC and the parties named therein \(incorporated by reference to Exhibit 2.7 to our Annual Report on Form 20-F \(file no. 001-35370\), initially filed with the SEC on March 19, 2018\)](#)
- 10.6* [Executive Share Option Plan \(incorporated by reference to Exhibit 10.3 to our Registration Statement on Form F-1 \(file no. 333-178278\), as amended, initially filed with the SEC on December 2, 2011\)](#)
- 10.7* [Long-Term Umbrella Incentive Plan \(incorporated by reference to Exhibit 4.2 to our Annual Report on Form 20-F \(file no. 001-35370\), initially filed with the SEC on March 19, 2018\)](#)
- 10.8* [Amended and Restated Non-Executive Director Equity Incentive Plan \(incorporated by reference to Exhibit 4.7 to our Annual Report on Form 20-F \(file no. 001-35370\), filed with the SEC on March 29, 2013\)](#)
- 10.9* [The Luxfer Share Incentive Plan, initially filed with the SEC on March 11, 2019, amended May 15, 2019](#)
- 10.10* [The Luxfer Employee Stock Purchase Plan, filed with the SEC on March 11, 2019](#)
- 10.11* [Form of Executive Officer IPO Stock Option Grant Agreement \(incorporated by reference to Exhibit 10.6 to our Registration Statement on Form F-1 \(file no. 333-178278\), as amended, initially filed with the SEC on December 2, 2011\)](#)
- 10.12* [Form of Non-Executive Director IPO Stock Option Grant Agreement \(incorporated by reference to Exhibit 10.7 to our Registration Statement on Form F-1 \(file no. 333-178278\), as amended, initially filed with the SEC on December 2, 2011\)](#)
- 10.13* [Employment Agreements, filed with the SEC on March 11, 2019](#)
- 10.14* [Employment Agreements, filed with the SEC on March 11, 2019,](#)
- 10.15* [Employment Agreements, filed with the SEC on March 11, 2019](#)
- 10.16* [Employment Agreements, filed with the SEC on March 11, 2019](#)
- 10.17 [Lease with Cherokee Properties, filed with the SEC on March 11, 2019](#)

- 10.18 [Lease with Cherokee Properties - Amendment 1, dated August 2005](#)[Lease with Cherokee Properties, filed with the SEC on March 11, 2019](#)
- 10.19 [Lease with Cherokee Properties - Amendment 2, dated January 2018](#)[Lease with Cherokee Properties, filed with the SEC on March 11, 2019](#)
- 21.1 [List of Subsidiaries of the Company](#)
- 23.1 [Consent of PricewaterhouseCoopers LLP](#)
- 31.1 [Certification Required by Rule 13a-14\(a\) or 15d-14\(a\) under the Securities Exchange Act of 1934-Alok Maskara](#)
- 31.2 [Certification Required by Rule 13a-14\(a\) or 15d-14\(a\) under the Securities Exchange Act of 1934-Heather Harding](#)
- 32.1 [Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 \(Subsections \(a\) and \(b\) of Section 1350, Chapter 63 of Title 18, United States Code\)-Alok Maskara](#)
- 32.2 [Certification Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 \(Subsections \(a\) and \(b\) of Section 1350, Chapter 63 of Title 18, United States Code\)-Heather Harding](#)
- 101 The financial statements from the Company's Annual Report on Form 10-K for the year ended December 31, 2018, formatted in XBRL: (i) Consolidated Statements of Income, (ii) Consolidated Statements of Comprehensive Income, (iii) Consolidated Balance Sheets, (iv) Consolidated Statements of Cash Flows, (v) Consolidated Statements of Changes in Equity, and (vi) Notes to Consolidated Financial Statements, tagged as blocks of text and including detailed tags.

* 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.

Luxfer Holdings plc
(Registrant)

/s/Alok Maskara

Alok Maskara

Chief Executive Officer
(Duly Authorized Officer)

March 9, 2020

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

Signature	Title	Date
<u>/s/Alok Maskara</u> Alok Maskara	Chief Executive Officer (Principal Executive Officer) and Director	March 9, 2020
<u>/s/Heather Harding</u> Heather Harding	Chief Financial Officer (Principal Financial Officer)	March 9, 2020
<u>/s/Stephen M.D. Webster</u> Stephen M.D. Webster	Corporate Controller (Principal Accounting Officer)	March 9, 2020
<u>/s/David F. Landless</u> David F. Landless	Chairman of the Board and Director	March 9, 2020
<u>/s/Allisha Elliott</u> Allisha Elliott	Director	March 9, 2020
<u>/s/Richard J. Hipple</u> Richard J. Hipple	Director	March 9, 2020
<u>/s/Clive J. Snowdon</u> Clive J. Snowdon	Director	March 9, 2020
<u>/s/Lisa G. Trimberger</u> Lisa G. Trimberger	Director	March 9, 2020

