VESUVIUS PLC

28 July 2022

Half Year Results for the six months ended 30 June 2022

Strong financial performance driven by full mitigation of inflationary pressures and market share gains

Vesuvius plc, a global leader in molten metal flow engineering and technology, announces its unaudited results for the six months ended 30 June 2022.

Financial summary	H1 2022 (£m)	H1 2021 (£m)	Year-on-year change	Underlying change[1]
Revenue	1,015.9	808.1	+26%	+21%
Trading Profit [2] (adjusted EBITA)	127.4	73.3	+74%	+69%
Return on Sales [2]	12.5%	9.1%	+340 bps	+350 bps
Operating Profit	122.3	68.5	+79%	
Profit Before Tax	116.7	65.5	+78%	
Headline Profit Before Tax [2]	121.8	70.3	+73%	
Profit	84.9	46.3	+83%	
Headline Earnings [2]	84.7	48.5	+75%	
Statutory EPS (pence)	30.0p	15.9p	+89%	
Headline EPS [2] (pence)	31.4p	17.9p	+75%	
Adjusted operating cash flow [2]	33.1	37.9	(13%)	
Cash generated from operations	69.0	50.2	+37%	
Net Debt [2]	327.7	196.6	+67%	
Dividend (pence per share)	6.5p	6.2p	+5%	

[1] Underlying basis is at constant currency and excludes separately reported items and the impact of acquisitions and disposals.
[2] For definitions of non-GAAP measures, refer to Note 15 in the Condensed Group Financial Statements.

Half Year 2022 Highlights

- Revenue of £1,015.9m, an increase of +21% on an underlying basis
- Trading profit (adjusted EBITA) of £127.4m, an increase of 69% on an underlying basis
- These increases were driven by:
    - Selling price increases to fully mitigate inflationary pressures and cover the price lag from 2021
    - Market share gains across both divisions
    - Predicated on the relevance of our technology-driven business model that provides value for customers
- Positive volume growth of c.2% in our Steel Division (excluding the impact of Universal business acquisition) in the world excluding China and Iran, despite a 4% decline in the corresponding steel production. Volume decline in China was limited to c.1% despite a 6.5% decline in the corresponding steel production. Flow Control volume growth worldwide was above the average of the Steel division
- Despite market share gains, the Foundry division saw a decline in volume of c.3% due to continued weakness in the automotive market. It however delivered strong volume growth in key developing markets including Turkey (+9%), Brazil (+8%) and Vietnam (+6%)
- The integration of the Universal Refractories business is proceeding as planned and performance remains ahead of our expectations
- Strategic capacity expansion in Flow Control in Asia and EMEA remains on track
- Trade working capital/sales increased, as planned, to mitigate supply chain disruptions, reaching 22.8% (12m average) versus 20.9% at FY2021
- Net debt /adjusted EBITDA[2] of 1.3x at 30 June 2022 versus 1.4x at FY2021
- Doubling of our 2025 target for carbon footprint reduction from 10% to 20% (versus 2019 levels) and introducing an additional 2035 target of a 50% reduction

- Proposed interim dividend of 6.5p, a 5% increase on the prior year

Comment from Patrick André, CEO:

"Despite difficult market conditions, we achieved a record level of trading profit and profitability in the first half of 2022 thanks to the benefits of the restructuring of our manufacturing footprint over the past years and our continued investment in Research and Development. These results confirm the long-term profitability potential of our activity under normal market conditions and the importance of our technology driven business model.

"In the coming months, we expect a further deterioration of our market environment. Vesuvius is, however, well prepared to confront this temporary slowdown thanks to our lean, entrepreneurial and decentralised organisation. This, together with the positive results of the first half, make us confident that full year Group trading profit (EBITA) will be towards the top end of the range of current analysts' expectations.(3)

"Beyond the current temporary slowdown of activity, we remain fully confident in the longer-term growth potential of both our Steel and Foundry end markets and are continuing at pace the implementation of our expansion programme through capital investments, in particular in Flow Control."

(2) For definitions of non-GAAP measures, refer to Note 15 in the Condensed Group Financial Statements.
(3) The range of analyst expectations as at 25 July 2022 for 2022 Trading Profit (EBITA) is between £155m and £199m compiled by Vesuvius.

Presentation of Half Year 2022 Results

Vesuvius management will make a presentation to analysts and investors on 28 July 2022 at 09.30 UK time at the London Stock Exchange, 10 Paternoster Square, London EC4M 7LS. For those unable to attend, the event will be livestreamed and can be accessed by clicking here. Participants can also join via an audio conference call. Please click here to register. Once registered, you will be provided with the information needed to join the conference, including dial-in numbers and passcodes. Be sure to save this information in your calendar.

For further information, please contact:
Shareholder/analyst enquiries:

Vesuvius plc	Patrick André, Chief Executive	+44 (0) 207 822 0000
	Guy Young, Chief Financial Officer	+44 (0) 207 822 0000
	Euan Drysdale, Group Head of Corporate Finance	+44 (0) 7584 641 315
	Rachel Stevens, Head of Investor Relations	+44 (0) 7387 545 271
Media enquiries:		
MHP Communications	Andrew Jaques/ Rachel Farrington/Peter Lambie	+44 (0) 203 128 8570

About Vesuvius plc

Vesuvius is a global leader in molten metal flow engineering and technology principally serving process industries operating in challenging high-temperature conditions.

We develop innovative and customised solutions, often used in extremely demanding industrial environments, which enable our customers to make their manufacturing processes safer, more efficient and more sustainable. These include flow control solutions, advanced refractories and other consumable products and increasingly, related technical services including data capture.

We have a worldwide presence. We serve our customers through a network of cost-efficient manufacturing plants located close to their own facilities, and embed our industry experts within their operations, who are all supported by our global technology centres.

Our core competitive strengths are our market and technology leadership, strong customer relationships, well established presence in developing markets and our global reach, all of which facilitate the expansion of our addressable markets.

Our ultimate goal is to create value for our customers, and to deliver sustainable, profitable growth for our shareholders giving a superior return on their investment whilst providing each of our employees with a safe workplace where they are recognised, developed and properly rewarded.

We think beyond today to create solutions that will shape the future for everyone.

Forward looking statements

This announcement contains certain forward looking statements which may include reference to one or more of the following: the Group's financial condition, results of operations, cash flows, dividends, financing plans, business strategies, operating efficiencies or synergies, budgets, capital and other expenditures, competitive positions, growth opportunities for existing products, plans and objectives of management and other matters.

Statements in this announcement that are not historical facts are hereby identified as "forward looking statements". Such forward looking statements, including, without limitation, those relating to the future business prospects, revenue, working capital, liquidity, capital needs, interest costs and income, in each case relating to Vesuvius, wherever they occur in this announcement, are necessarily based on assumptions reflecting the views of Vesuvius and involve a number of known and unknown risks, uncertainties and other factors that could cause actual results, performance or achievements to differ materially from those expressed or implied by the forward looking statements. Such forward looking statements should, therefore, be considered in light of various important factors that could cause actual results to differ materially from estimates or projections contained in the forward looking statements. These include without limitation: economic and business cycles; the terms and conditions of Vesuvius' financing arrangements; foreign currency rate fluctuations; competition in Vesuvius' principal markets; acquisitions or disposals of businesses or assets; and trends in Vesuvius' principal industries.

The foregoing list of important factors is not exhaustive. When considering forward looking statements, careful consideration should be given to the foregoing factors and other uncertainties and events, as well as factors described in documents the Company files with the UK regulator from time to time including its annual reports and accounts.

You should not place undue reliance on such forward looking statements which speak only as of the date on which they are made. Except as required by the Rules of the UK Listing Authority and the London Stock Exchange and applicable law, Vesuvius undertakes no obligation to update publicly or revise any forward looking statements, whether as a result of new information, future events or otherwise. In light of these risks, uncertainties and assumptions, the forward looking events discussed in this announcement might not occur.

Vesuvius plc, 165 Fleet Street, London EC4A 2AE
Registered in England and Wales No. 8217766
LEI: 213800ORZ521W585SY02
www.vesuvius.com

Vesuvius plc

Half Year Results for the six months ended 30 June 2022

Vesuvius delivered its strongest ever half year performance, driven by full mitigation of inflationary pressures and market share gains

£m	H1 2022 Reported	Acquisitions / Disposals	H1 2022 Underlying	H1 2021 Reported	Currency	Acquisitions / Disposals	H1 2021 Underlying	Reported % Change	Underlying % Change
Revenue	1,015.9	(18.3)	997.6	808.1	13.7		821.8	25.7%	21.4%
Trading Profit	127.4	(2.9)	124.5	73.3	0.3		73.6	73.8%	69.1%
Return on Sales	12.5%		12.5%	9.1%			9.0%	+340bps	+350bps

Group trading performance

In H1 2022, the Group generated revenues of £1,015.9m, an increase of 26% compared to H1 2021, on a reported basis. Underlying Group revenue, adjusted for the effects of currency translation and acquisitions/disposals, increased by 21%, driven primarily by selling price increases which fully mitigated inflationary pressures. Trading profit (adjusted EBITA) was £127.4m, an increase of 74% on a reported basis and 69% on an underlying basis. The Group achieved a return on sales of 12.5% in H1 2022, an increase of +340bps (+350bps on an underlying basis) which brings our return on sales for the last 12 months to 10.6%, in line with that delivered in 2019. This was our strongest ever half year performance, which was achieved despite a challenging back drop of steel production declines and broad-based inflationary pressures.

Market backdrop

Steel production in the world excluding China and Iran, which accounts for approximately 90% of Vesuvius' sales, decreased by -4% year-on-year to the end of June (Source: the World Steel Association), with all major geographies recording volume declines, except for India which grew by +9%. The production declines in EMEA excluding Iran, NAFTA and South America were -9%, -2% and -3%, respectively.

Non-automotive Foundry end-markets have achieved limited growth since H1 2021, with production in general engineering, mining & construction, power generation and railway & marine growing by +3%, +1%, +1% and -1%, respectively, according to Oxford Economics data.

This contrasts with global production of light vehicles and medium & heavy commercial vehicles which declined in H1 2022 versus H1 2021 by -3% and -28%, respectively, according to IHS data. Encouragingly, automotive end markets appear to have stabilised in H1 2022 versus H2 2021, with light vehicle volumes up +1% and medium & heavy vehicles up +5%. These figures are more likely to reflect a stabilisation than a return to growth given that automotive production is typically higher in H1 versus H2 as a result of summer plant shutdowns during the third quarter.

Strategic progress

Vesuvius' core strategic objective is to deliver long-term sustainable and profitable growth. We have a clear strategy to achieve this objective centred around our key execution priorities. We continued to make progress on these priorities in H1 2022, and believe we are well-positioned to deliver a robust performance in the coming months.

- **Reinforce our technology leadership**
  - Maintained our industry-leading level of R&D investment, with a 19% increase in H1 2022 R&D spend to £17.6m, up from £14.8m in H1 2021
  - We are targeting a doubling in Robot Casting Technology ("RCT") customer installations by 2025
- **Develop our technical service offering and increase the penetration of our value-creating solutions**
  - **Flow Control**: Continued development of our RCT range for the ladle make-up area. The Flow Control device and refractory consumables are tailor-made for robotic operations. These products increase the ergonomics of the process, consistency, productivity and reduce the cost of usage through greater efficiency of refractory consumption and reduced manpower requirement

    - **Advanced Refractories**: Further development of Vesuvius Advanced Robotic Gunning ("VARG"), where we have partnered with a major steel producer to commission the first VARG installation. VARG enables steel producers to undertake fully automated, "hands-free" furnace repair gunning on BOF enabled by a combination of advanced Vesuvius technology, systems and materials
    - **Foundry**: Product for the rotary cleaning of steel, a new steel treatment process that significantly reduces non-metallic inclusion defects in high integrity castings, reducing the need for costly rectification.
- **Capture growth in developing markets**
    - Our Steel division delivered strong growth in Brazil, India, Vietnam and Turkey
    - Our Foundry division delivered strong growth in Brazil, Vietnam and Turkey
- **Improve our cost leadership and margins**
    - Return on sales increased to 12.5%, up 350bps versus H1 2021
    - The Steel division return on sales improved 500bps to 13.7%, driven by the recovery of the cost headwinds which impacted the division in 2021 and 2022 and a favourable mix effect with higher sales of Flow Control products
    - The Foundry division achieved meaningful margin recovery compared to H2 2021, due to price increases and operational improvements at two important plants in Germany and the USA

Enhanced ambitious sustainability targets for reducing our carbon emissions
In alignment with our target to achieve net zero by 2050, we have enhanced our target for 2025 up to -20% (vs. 2019 levels), compared to our earlier target of -10%, which we exceeded in 2021. We have also added a staging-point target of -50% by 2035. Both targets are supported by a roadmap of actions to deliver these savings, including planning our first pilot study to convert gas kilns to electricity.

Good progress in integration of the Universal Refractories Inc ("Universal") business
Following the acquisition of the Universal business in December 2021, it has made a strong contribution to the Group to date, slightly ahead of plan. The acquisition reinforces our core tundish business (within Advanced Refractories) and expands our presence amongst the growing electric arc furnace ("EAF") steel producers in North America, while also further strengthening our Foundry business. During this initial period of integration, we have sought to maintain and develop the strong elements of the business, while realising synergies through the consolidation of both Advanced Refractories and Foundry production lines. We have also implemented our global health and safety standards and brought managers on to our incentive schemes, such that they have a financial interest in the performance of Vesuvius. These actions, combined with regular communication with the employee base, has facilitated high employee retention through the transition period.

Foreign exchange
The net impact of average H1 2022 exchange rates compared to 2021 averages has been an H1 2022 tailwind of approximately £2.6m at a trading profit level. The implied impact of average H1 2022 exchange rates, when compared to average 2021 exchange rates, would be a tailwind of 3% on our 2022 full year trading profit.

Selling price increases have fully mitigated all inflationary pressures
Our active management of selling prices has successfully offset all cost inflation to date, with the recovery in full of the cost headwind that impacted the Group in 2021. Our H1 2022 results bring our LTM margin to 10.6%, in line with that delivered in 2019. We do not expect raw material costs to continue to increase in 2022, although broader based inflation, energy and labour costs remain under pressure.

Working capital
As indicated previously, we have continued to see working capital growth in early 2022 due to higher business activity and our decision during 2021 to build-up raw material inventory to counteract the risk of supply chain disruption and ensure customer deliveries. This resulted in an increase in trade working capital/sales to 22.8% (12m average) versus 20.9% at year-end 2021.

A reduction of working capital intensity is contingent on an improved supply chain, which is not expected until late in 2022 or early 2023.

Tax
Our headline Effective Tax Rate ("ETR") for H1 2022 was 27.5% (H1 2021: 26.5%). This resulted in an H1 2022 headline tax charge of £33.2m (H1 2021: £18.5m).

Capital expenditure
Capex for the period was £38.6m, over double that in H1 2021 of £17.6m. Major projects included are the significant investment in additional Flow Control capacity at the Skawina plant in Poland, to support the growing EEMEA market, and the Flow Control capacity expansion in Kolkata, India to serve the fast-growing markets of both India and South-East Asia.

Financial position and liquidity
As at 30 June 2022, Net Debt was £327.7m, up from £277.1m at the end of 2021. Our adjusted operating cash flow was £33.1m, after payment of £40.5m of dividends, £5.3m of net finance costs, and £23.6m of income taxes.

Our Net Debt/adjusted EBITDA ratio was 1.3x at 30 June 2022, versus 1.4x at 31 December 2021. This provides us with significant headroom against our debt covenant limit of 3.25x net debt/adjusted EBITDA. Our available committed liquidity was £416m at 30 June 2022, compared to £456m at 31 December 2021.

Quality, health and safety
The Board and the entire leadership team of Vesuvius place great emphasis on the importance of quality, health and safety in the workplace and in the communities in which we operate. Reliability in quality and delivery is vital to our customers as they use Vesuvius' products in critical areas of their own processes. The level of risk attached to a catastrophic failure is often such that, for people and equipment, no compromise can be accepted. We achieved a Lost Time Injury Frequency Rate (LTIFR) of 1.07 in the first half of 2022, broadly in-line with our record low level of 1.06 which we achieved in 2021.

Exposure to hostilities between Russia and Ukraine
We have ceased trading with all sanctioned customers in Russia. In parallel, having considered the approach taken by the majority of our peers and the effectiveness of stopping all trade with Russia, in that context we have now resolved to continue to supply non-sanctioned customers in Russia.

Potential gas supply issues in Europe
At the time of writing, there is political uncertainty regarding the sustainability of gas supplies from Russia into Europe over the coming months, which could impact both our operations and those of our customers. We have been reviewing possible scenarios and have put in place mitigation plans to support our operations in Europe, including, if necessary, the mobilisation of available production capacity in India, Mexico, the Middle East and China. As a result, we anticipate that we will be able to continue providing essential products and services to our European customers even in the case of a complete cessation of Russian gas imports. Furthermore, as our most energy intensive European based manufacturing processes were closed or transferred out of Europe in the framework of our European footprint restructuring two years ago, our exposure to rising European energy prices is now relatively limited.

Interim Dividend
The Board has declared an interim dividend of 6.5 pence per share, which is a 5% increase on the interim dividend for H1 2021 of 6.2 pence per share.

The interim dividend will be paid on 16 September 2022 to shareholders on the register at the close of business on 5 August 2022. Any shareholder wishing to participate in the Vesuvius Dividend Reinvestment Plan needs to have submitted their election to do so by 25 August 2022.

Outlook
In the coming months, we expect a further deterioration of our market environment. Vesuvius is, however, well prepared to confront this temporary slowdown thanks to our lean, entrepreneurial and decentralised organisation. This, together with the positive results of the first half, make us confident that full year Group trading profit (EBITA)(1) will be towards the top end of the range of current analysts' expectations.(2)

Beyond the current temporary slowdown of activity, we remain fully confident in the longer term growth potential of both our Steel and Foundry end markets and are continuing at pace the implementation of our expansion programme through capital investments, in particular in Flow Control.

(1) *For definitions of non-GAAP measures, refer to Note 15 in the Condensed Group Financial Statements.*
(2) *The range of analyst expectations as at 25 July 2022 for 2022 Trading Profit (EBITA) is between £155m and £199m compiled by Vesuvius.*

Operational Review

Vesuvius comprises two Divisions, Steel and Foundry. The Steel Division operates as three business lines, Flow Control, Advanced Refractories and Sensors & Probes.

Steel Division

Steel production in the world excluding China and Iran, which accounts for approximately 90% of Vesuvius' sales, decreased by 4% year-on-year to the end of June, with all major geographies recording volume declines, except for India which grew by9%. The production declines in EMEA excluding Iran, NAFTA and South America were -9%, -2% and -3%, respectively.

Vesuvius' Steel Division reported revenues of £744.0m in H1 2022, an increase of 31% compared to H1 2021 on a reported basis. On an underlying basis, Steel Division revenue was up 25% (2% volume), with particularly strong performance in Turkey, Vietnam and India, where volumes grew 71%, 18% and 8%, respectively.

Flow Control strongly outperformed steel production in all regions, with underlying sales growth of 25% (4% volume growth). Volume growth in the world excluding China and Iran was 5%, versus a steel production decline of -4% in the year to June, reflecting our ability to continue gaining market share, even in a difficult cost and pricing environment, thanks to the technological differentiation of our product range. In Advanced Refractories, we achieved underlying sales growth of 24%, which included a volume decline limited to -1% (excluding the impact of the Universal business acquisition), as compared with a decline of 4% of world Steel volumes outside of China and Iran (-6.5% in China).

Steel Division trading profit improved 106% to £101.7m. Return on sales expanded 500bps to 13.7%, driven by two key factors: (1) recovery of the cost headwind that impacted the Group in 2021 and 2022 and (2) a positive mix effect due to higher volume growth in the more profitable Flow Control products.

Steel Division	**H1 2022 (£m)**	**H1 2021 (£m)**	**Change (%)**	**Underlying change (%)**
Flow Control Revenue	402.6	315.5	28%	25%
Advanced Refractories Revenue	320.8	238.6	35%	24%
Steel Sensors &Probes Revenue	20.6	16.2	27%	22%
Total Steel Revenue	**744.0**	**570.3**	31%	25%
Total Steel Trading Profit	101.7	49.4	106%	97%
Total Steel Return on Sales	13.7%	8.7%	+500bps	+500bps

Flow Control

The Flow Control business unit supplies the global steel industry with consumable ceramic products, systems, robotics, digital services and technical services. These products are used to contain, control and monitor the flow of molten steel in the continuous casting process. The consumable ceramic products that Vesuvius supplies have a short service life (often a matter of a few hours) due to the significant wear caused by the extremely demanding environment in which they are used. These products must withstand extreme temperature changes, whilst resisting liquid steel and slag corrosion. In addition, the ceramic parts in contact with the liquid steel must not in any way contaminate it. The quality, reliability and consistency of these products and the associated robotic *solutions and digital services we provide are therefore critical to the quality of the finished metal being produced and the productivity, profitability and safety of our customers' processes.*

Flow Control Revenue	**H1 2022 (£m)**	**H1 2021 (£m)**	**Change (%)**	**Underlying change (%)**
Americas	155.4	101.9	53%	43%
Europe, Middle East & Africa (EMEA)	142.2	124.1	15%	19%
Asia-Pacific	105.0	89.4	17%	13%
Total Flow Control Revenue	402.6	315.5	28%	25%

In H1 2022, underlying revenues in the Group's Flow Control business increased by 25% year-on-year to £402.6m, driven by significant price increases and market share gains in all regions.

In EMEA excluding Iran, revenues grew 19% year-on-year on an underlying basis, resulting from significant price increases and a volume decline of -4%, which represents an outperformance versus steel production which declined by -9% in the year to June. Our outperformance in the region was greatest in Eastern Europe, Middle East and Africa ("EEMEA") (excluding Iran), where we experienced a volume decline of only -5% versus a -12% decline in steel volumes.

In the Americas, underlying revenues grew 43%, also driven by significant price rises. On a volume basis, we outperformed steel production growth in key markets including Mexico, Brazil and the United States, where our volumes grew 6%, 5%, and 1%, respectively, versus steel production decline in the year to June of -1%, -3% and -2% respectively.

In Asia Pacific, revenues grew +13% on an underlying basis, which included a mix of both price rises and volume increases. On a volume basis, we outperformed steel production growth in key markets such as Japan, Vietnam, India and China where our volumes changed +16%, +18%, +13% and -2%, respectively, versus changes in steel production in the year to June of -4%, -7%, +9% and -6%.

Advanced Refractories

The Advanced Refractories business unit supplies complete value-added solutions to its customers including specialist refractory materials and advanced installation technologies which harness mechatronic solutions, computational fluid dynamics capabilities and lasers. The specialist refractory materials are subject to extreme temperatures, corrosion and abrasion, they are in the form of powder mixes, which are spray-applied or cast onto the vessel to be lined ('monolithics') and refractory shapes (e.g. bricks, pads, dams and other larger precast shapes). The service life of the products that Advanced Refractories supplies into the steel making process can vary (some a matter of hours and others for a period of years) based upon the type of refractory and the level of wear caused by the demanding environment in which they are used. An integral part of our success depends upon our best-in-class installation technologies which improve the consistency and performance of installed Vesuvius refractories as well as the high level of collaboration with our customers.

Advanced Refractories Revenue	**H1 2022 (£m)**	**H1 2021 (£m)**	**Change (%)**	**Underlying change (%)**
Americas	120.1	80.3	50%	20%
Europe, Middle East & Africa (EMEA)	120.1	90.3	33%	34%
Asia-Pacific	80.6	68.0	19%	16%
Total Advanced Refractories Revenue	320.8	238.6	35%	24%

Advanced Refractories reported revenues of £320.8m in H1 2022, an increase of 24% on an underlying basis, driven by significant price rises and an outperformance of steel production volumes in several key regions, as we regained market share lost in 2021, when we were a first mover in raising prices to offset inflationary pressures.

On an underlying basis, revenues grew 20% in the Americas driven by price rises. In EMEA excluding Iran, underlying revenues grew by 34% during the period, driven by significant price rises and a volume decline of -4%, which represents a material outperformance of steel production, which was down -9% in the year to June.

In Asia Pacific, revenues grew 16% on an underlying basis, which included a mix of both price rises and volume increases. On a volume basis, we outperformed steel production growth in key markets such as Vietnam and China where our volumes grew 17% and 2%, respectively, versus steel production declines in the year to June of -7% and -6%.

Steel Sensors & Probes

The Steel Sensors & Probes business unit offers products to our customers to enable them to make their underlying processes more efficient and reliable. The business unit focuses on providing a range of products that enhance the control and monitoring of our customers' production processes, complementing Vesuvius' strong presence and expertise in molten metal engineering. These products include temperature sensors, oxygen, hydrogen and sublance probes, iron oxide and metal sampling for the steel, aluminium and foundry industries. By using these technologies, customers can focus on critical parameters within their processes, enabling them to refine their production methods to improve quality, lower production costs and maximise efficiency.

Steel Sensors & Probes Revenue	H1 2022 (£m)	H1 2021 (£m)	Change (%)	Underlying change (%)
Americas	13.8	10.5	31%	22%
Europe, Middle East & Africa (EMEA)	6.6	5.7	16%	21%
Asia-Pacific	0.2	0.1	287%	298%
Total Steel Sensors & Probes Revenue	20.6	16.2	27%	22%

Revenues in Steel Sensors & Probes were £20.6m in H1 2022, representing an underlying increase of 22% year-on-year. The strong performance was driven by price rises as well as new customer wins in both the Americas and EMEA.

Foundry Division

The Foundry Division is a world leader in the supply of consumable products, technical advice and application support to the global foundry industry to improve the performance and quality of ferrous and non-ferrous castings. Vesuvius operates under the brand FOSECO in the foundry market. The foundry process is highly sequential and is critically dependent on consistency of product quality and productivity optimisation. Working alongside customers at their sites, our engineers provide on-site technical expertise in addition to advanced computational fluid dynamics capabilities to develop the best customised solutions. The conditioning of molten metal, the nature of the mould used and, especially, the design of the way metal flows into the mould are key parameters in a foundry, determining both the quality of the finished castings and the labour, energy and metal usage efficiency of the foundry. Vesuvius' products and associated services to foundries improve all of these parameters.

Foundry Division	H1 2022 (£m)	H1 2021 (£m)	Change (%)	Underlying change (%)
Foundry Revenue	271.9	237.8	14%	14%
Foundry Trading Profit	25.7	23.9	7%	9%
Foundry Return on Sales	9.5%	10.1%	-60bps	-40bps

Despite an improved level of trading profit resulting from successful price increase initiatives, the profitability of the Foundry division in H1 2022 as measured by return on sales was negatively impacted by a significant volume decline in the light and heavy vehicles markets as compared with H1 2021, which was not compensated by the slight improvement in other markets.

Global production of light vehicles and medium & heavy commercial vehicles declined in H1 2022 versus H1 2021 by -3% and -28%, respectively, according to IHS data. Encouragingly however, automotive end markets appear to have stabilised in H1 2022 versus H2 2021, with light vehicle volumes up 1% and medium & heavy vehicles up 5%. These figures are more likely to reflect a stabilisation than a return to growth given that automotive production is typically higher in H1 versus H2 as a result of summer plant shutdowns during the third quarter.

Automotive production remains for the time being significantly below the pre-covid level of 2019, with global light vehicle production in H1 2022 versus H1 2019 down -16% and medium & heavy commercial vehicles down -22%, due to supply chain constraints such as the persistent semi-conductor shortage.

In parallel, non-automotive Foundry end-markets have only achieved limited growth globally since H1 2021, with production in general engineering, mining & construction, power generation and railway & marine changing by +3%, +1%, +1% and -1%, respectively, according to Oxford Economics data.

Vesuvius' Foundry Division reported revenues of £271.9m in H1 2022, an increase of +14% compared to H1 2021 on a reported basis. On an underlying basis, Foundry Division revenue was up +14%. This increase in revenues was driven by price increases despite a low single digit volume decline due primarily to continued weakness in automotive end markets.

The Foundry Division's margin, albeit lower than H1 2021, shows a meaningful recovery compared to H2 2021 (+240bps), when trading profit was negatively impacted by operational issues at two important plants in Germany and the USA as well as the time lag between price and cost increases, which has now been fully eliminated. Good progress has been made in resolving these operational issues and we expect them to be fully eliminated during 2022.

When compared to H1 2021, trading profit increased by 9% on an underlying basis to £25.7m.

Foundry Revenue	**H1 2022 (£m)**	**H1 2021 (£m)**	**Change (%)**	**Underlying change (%)**
Americas	67.2	48.6	38%	25%
Europe, Middle East & Africa (EMEA)	116.9	104.4	12%	18%
Asia-Pacific	87.7	84.7	4%	2%
Total Foundry Revenue	**271.9**	**237.8**	14.3%	13.5%

Foundry revenues in the Americas grew 25% year-on-year on an underlying basis, which reflects a significant increase in prices in addition to single digit volume growth in key end markets such as Brazil (8%), Mexico (3%) and the United States (3%). Volumes in the Americas benefitted from positive year-on-year growth in NAFTA automotive production.

In EMEA, underlying revenues increased by 18% compared to H1 2021, which was driven by price increases. Volumes posted a low single digit decline, driven by production declines of greater than 10% in both the light vehicle and medium & heavy vehicles markets.

In Asia Pacific, sales increased by 2% on an underlying basis, with a low single digit volume decline driven by weakness in China due to two key factors: the impact of further lock-downs resulting from an increase in Covid-19 infections; and a decline in automotive production with light vehicle and medium and heavy vehicle production down -5% and -52%, respectively.

Financial Review

The following review considers a number of our financial KPIs and sets out other relevant financial information.

Basis of Preparation

All references in this financial review are to headline performance unless stated otherwise. See Note 15.1 to the Group Financial Statements for the definition of headline performance.

H1 2022 performance overview

We are pleased with the performance of the Group in H1 2022, following implementation of price increases to recover increased raw material costs. Reported revenue increased by £207.8m (25.7%) over the prior year. H1 2021 revenues on H2 2022 FX rates were £821.7m. Revenue on a constant currency basis (excluding the impact of acquisitions) grew by £175.8m (+21%), which was almost entirely due to price increases. The revenue contribution from the acquisition of the Universal business was £18.3m.

Our Steel division achieved positive volume growth of c.2% despite a 4% decline in steel production in the world excluding China and Iran. Our Foundry division experienced a low single digit volume decline due primarily to continued weakness in automotive end markets.

The Group is actively managing working capital to drive a strong reduction in inventory and overdues in response to weakening end markets.

Trading profit for H1 2022 was £127.4, 69.1% higher than prior year on an underlying basis. This was a result of a £6.1m benefit from increased volumes and mix, £10.3m recovery of comparable prior period input cost increases, and a £34.5m benefit from the net impact of price rises. The Universal business acquisition contributed £2.9m. Return on sales was 12.5%, higher than prior year by 350 bps on an underlying basis.

Operating profit increased by 79% to £122.3m, reflecting the changes in trading profit described above, net of amortisation of intangible assets of £5.1m (HY21: £4.8m).

The Group's cash conversion in H1 2022 was impacted by increases in working capital and higher investments in capex.

Dividend

The Board declared an interim dividend of 6.5 pence per share to be paid on 16 September 2022 to shareholders on the register at the close of business on 5 August 2022. Any shareholder wishing to participate in the Vesuvius Dividend Reinvestment Plan needs to have submitted their election to do so by 25 August 2022.

It remains the Board's intention to deliver long-term dividend growth, provided this is supported by underlying earnings and cash flows, and taking into account capital expenditure requirements and the prevailing market outlook.

Key Performance Indicators

We have identified a number of KPIs against which we have consistently reported. As with prior years, we measure our results on an underlying basis, where we adjust to ensure appropriate comparability between periods, irrespective of currency fluctuations and any business acquisitions and disposals.

This is done by:

- Restating the previous period's results at the same foreign exchange (FX) rates used in the current period
- Removing the results of disposed businesses in both the current and prior years
- Removing the results of acquired businesses in both the current and prior years

Therefore, for 2022, we have retranslated 2021 results at the FX rates used in calculating the 2022 results. Adjustment has also been made for 2022 results to remove the results of Universal, which was acquired during 2021.

Objective: Deliver growth

KPI: Underlying revenue growth

Reported revenue for H1 2022 was £1,015.9m. Reported revenue for H1 2021 was £808.1m which equated to £821.8m on an underlying basis. H1 2022 underlying revenue increased by 21.4% year-on-year. The strong increase in revenue in Steel has been driven by strong price increases (+23% price) as well as strong underlying performance in Steel (+2% volume). The Foundry Division increase in revenues was driven primarily by price increases.

£m	H1 2022 Revenue			H1 2021 Revenue				% change	
	As reported	Acquisition/ Disposals	Underlying	As reported	Currency	Acquisition/ Disposals	Underlying	Reported	Underlying
Steel	**744.0**	**(17.3)**	**726.8**	570.3	12.9	-	583.1	31%	25%
Foundry	**271.9**	**(1.0)**	**270.8**	237.8	0.9	-	238.7	14%	14%
Total Group	**1,015.9**	**(18.3)**	**997.6**	808.1	13.7	-	821.8	26%	21%

Objective: Generate value for our shareholders

KPI: Trading profit and Return on Sales

We continue to measure underlying trading profit of the Group as well as trading profit as a percentage of sales, which we refer to as our Return on Sales or RoS.

Trading profit for H1 2022 was £127.4m and Return on Sales was 12.5%. On an underlying basis, trading profit of £124.5m increased by 69% and Return on Sales by 350bps versus prior year. The increase in trading profit and Return on Sales is due to pricing in Steel and Foundry, and volume growth in Steel.

In H1 2022, the Steel Division recorded underlying Return on Sales of 13.6%, a 500bps underlying improvement from H1 2021. Trading profit increased by 97% on an underlying basis, to £99.0m during the period.

The Foundry division recorded underlying Return on Sales of 9.4%, a 40bps decline from H1 2021 on an underlying basis. Underlying trading profit was £25.5m representing an 8.8% increase on an underlying basis versus prior year.

£m	H1 2022 Trading profit			H1 2021 Trading profit				% change	
	As reported	Acquisition/ Disposals	Underlying	As reported	Currency	Acquisition/ Disposals	Underlying	Reported	Underlying
Steel	**101.7**	**(2.7)**	**99.0**	49.4	0.8	-	50.2	106%	97%
Foundry	**25.7**	**(0.2)**	**25.5**	23.9	(0.5)	-	23.4	7%	9%
Total Group	**127.4**	**(2.9)**	**124.5**	73.3	0.3	-	73.6	74%	69%

KPI: Headline PBT and Headline EPS

Headline profit before tax (PBT) and headline earnings per share (EPS) are used to measure the underlying financial performance of the Group. The main difference between trading profit and PBT is net finance costs which were £6.6m in H1 2022, £3.0m higher than H1 2021.

Our Headline PBT was £121.8m, 73.3% above last year on a reported basis. Including amortisation of acquired intangibles of £5.1m, our PBT of £116.7m was 78% higher than H1 2021. Headline EPS from continuing operations at 31.4p is 75% higher than H1 2021.

KPI: Return on invested capital (ROIC)

ROIC has been recently introduced as a KPI to measure the returns we generate on the capital provided to us by our investors. The choice of ROIC as our preferred returns metric is predicated on it being a return that is applicable to both equity and debt investors and in addition is a post-tax measure. Our ROIC for the 12 months to 30 June 2022 was 9.6% (12 months to 31 December 2021: 7.4% on a constant currency basis). See note 15.18 for details of calculation.

Objective: Maintain an efficient capital structure

KPI: Free cash flow and working capital

Fundamental to ensuring that we have adequate capital to execute our corporate strategy is converting our profits into cash, partly through strict management of our working capital. The Group generated adjusted operating cash flows of £33.1m, representing a 13% decrease versus H1 2021. This implies a cash conversion rate in H1 2022 of 26% (2021: half year 52%; full year 32%). H1 2022 cash conversion was impacted by growing working capital and higher investments in capex. Free cash flow from continuing operations was £1.5m in H1 2022 (2021: half year £16.4m; full year £(0.3)m).

We measure working capital both in terms of actual cash flow movements, and as a percentage of sales revenue. Trade working capital as a percentage of sales in H1 2022 was 22.8% (2021: half year 20.7%; full year 20.9%), measured on a 12-month moving average basis. In absolute terms on a constant currency basis trade working capital increased by £93.1m in H1 2022.

The increase in inventory on a constant currency basis versus December 2021 (+£40.3m) and debtors (+£62.9m) was partially offset by an increase in creditors (+£10.1m).
£40.3m inventory increase was mainly reported in finished goods (£23.6m) and raw materials (£17.8m).

The £62.9m increase in trade debtors on a constant currency basis versus December 2021 was mainly recorded in current debtors +£56.1m. £7.0m increase was reported in overdues over 30 days. Regionally, the increase in overdues was reported in EMEA (£6.2m), partially offset by a decrease in NAFTA (£1.9m). While total trade debtors have increased, debtors days have remained relatively flat. We continue our focus on driving down overdues.

KPI: Net debt and interest cover

The Group had committed borrowing facilities of £721.4m as at 30th June 2022 (2021: 30 June £664.0m; 31 December £706.3m), of which £257.1m was undrawn (2021: 30 June £348.7m; 31 December £308.1m).

At the end of H1 2022, the net debt to EBITDA ratio was 1.3x (2021: 30 June 1.1x; 31 December 1.4x) and EBITDA to interest was 29.2x (2021: 30 June 21.4x; 31 December 30.5x). These ratios are monitored regularly to ensure that the Group has sufficient financing available to run the business and fund future growth.

The Group's debt facilities have two financial covenants: the ratios of net debt to EBITDA (maximum 3.25x limit) and EBITDA to interest (minimum 4x limit). Certain adjustments are made to the net debt calculations for bank covenant purposes, the most significant of which is to exclude the impact of IFRS 16.

Objective: Think beyond innovation

KPI: R&D Spend

We believe that our market-leading product technology and services deliver fundamental value to our customers and that the primary mechanism to deliver that value is to invest significantly in research and development. In H1 2022, we spent £17.6m on R&D activities (2021: half year £14.8m; full year £30.6m at constant 2022 currency), which represents 1.7% of our revenue (2021: half year 1.8%; full year 1.8%).

Financial Risk Factors

The Group undertakes regular risk reviews and, as a minimum, a full risk assessment process twice a year. As in previous years this included input from the Board in both the assessment of risk and the proposed mitigation. We consider the main financial risks faced by the Group as being those posed by a decline in our end-markets, leading to reduced revenue and profit as well as potential customer default. We also carefully monitor the challenges that come from broader financial uncertainty, which could bring lack of liquidity and market volatility. Important but lesser risk exists in interest rate movements, foreign exchange rate movements and cost inflation, but these are not expected to have a material impact on the business after considering the controls we have in place.

Our key mitigation of end-market risk is to manage the Group's exposure through balancing our portfolio of business geographically and to invest in product innovation. We do so through targeted capital investment in new and growing businesses and a combination of capital and human resource in emerging markets. When considering other financial risks, we mitigate liquidity concerns by financing, using both the bank and private placement markets. The Group also seeks to avoid a concentration of debt maturities in any one period to spread its refinancing risk. Liquidity stood at £416.2m on 30 June 2022. We define liquidity as undrawn committed debt facilities plus our cash on balance sheet, less the cash in China which is used as collateral against an equivalent loan from Standard Chartered.

Taxation

A key measure of the Group's tax burden is the headline effective tax rate, which the Group calculates on the income tax associated with headline performance, divided by the headline profit before tax and before the Group's share of post-tax profit of joint ventures. The Group's headline effective tax rate was in-line with expectations at 27.5% in H1 2022 (2021: half year 26.5%; full year 26.4%) based on the income tax costs associated with headline performance of £33.2m (2021: half year £18.5m; full year £35.9m).

We expect the Group's effective tax rate on headline profit before tax and before the share of post-tax profits from joint ventures to be between 27% and 28% in 2022.

Capital expenditure

Capital expenditure in H1 2022 was £38.2m (2021: half year £20.6m; full year £67.4m) of which £33.2m was in the Steel Division (2021: half year £16.1m; full year £47.2m) and £5.0m in the Foundry Division (2021: half year £4.5m; full year £20.2m).

Pensions

The Group has a limited number of historical defined benefit plans located mainly in the UK, USA, Germany and Belgium. The main plans in the UK and USA are largely closed to further benefits accrual. In the funded UK plan, an insurance asset from PIC matches the remaining pension liabilities of the UK Plan, with the result that the Company no longer bears any investment, longevity, interest rate or inflation risks in respect of this UK Plan. The Group's net pension liability on 30 June 2022 was £54.0m (2021 full year: £77.0m deficit). The improvement is largely attributable to £27.9m from changes to actuarial assumptions (increasing discount rates; updated mortality assumptions and pension membership data) which was mainly due to an increase in bond yields resulting in a reduction in the value of German, Belgian and US liabilities. These gains were partially offset by foreign exchange losses of £4.0m.

Principal Risks and Uncertainties

Risk Management
The Board exercises oversight of principal risks through a specific review of the way in which the Group manages those risks. This process provides the Board with a clear understanding of the individuals within the business responsible for the management of each specific risk and the mitigation in place to address it. The Board also reviews and establishes the Group's risk appetite for those issues identified as principal risks and the associated adequacy of the steps being taken to mitigate them.

The Board has overall responsibility for establishing and maintaining a system of risk management and internal control, and for reviewing its effectiveness. The Group undertakes a continuous process of risk identification and review, which includes a formal process, conducted annually for mapping risks from the bottom up, with each major business unit and key operational, senior functional and senior management staff identifying their principal risks. This assessment undergoes a formal review at half-year. The results are compiled centrally to deliver a coordinated picture of the key operational risks identified by the business. These risks are then reviewed by the Group Executive Committee. As part of this process, each Director contributes their individual view of the top-down strategic risks facing the Group – drawing on the broad commercial and financial experience they have gained both inside and outside the Group. The results of this assessment are then overlaid on the internal assessment of risks to build a comprehensive analysis of existing and emerging risk. The process extends to cover both financial and non-financial risks, and considers the risks associated with the impact of the Group's activities on employees, customers, suppliers, the environment, local communities and society more generally.

Risk Mitigation
The Principal Risks identified are actively managed in order to mitigate exposure. Senior management 'owners' have been identified for each principal risk, and they manage the mitigations of that specific risk and contribute to the analysis of its likelihood and materiality. This analysis is reported to the Board. The risks are analysed in the context of our business structure which gives protection against a number of principal risks we face with diversified currencies, a widespread customer base, local production matching the diversity of our markets and intensive training of our employees. Additionally, we seek to mitigate risk through contractual measures. Where cost-effective, the risk is transferred to insurers. Our processes are not designed to eliminate risk, but to identify our principal risks and seek to reduce them to a reasonable level in the context of the delivery of the Group's strategy.

Principal Risks
The risks identified are those the Board considers to be the most relevant to the Group in relation to their potential impact on the achievement of its Strategic Objectives. All of the risks set out on these pages could materially affect the Group, its businesses, future operations and financial condition, and could cause actual results to differ materially from expected or historical results. The Group continues to focus on risk mitigation, and whilst, as identified below, certain elements of the Group's risks have manifested in 2022 as a result of the continuing Covid pandemic, the Principal Risks remain the same. These risks are not the only ones that the Group will face. Some risks are not yet known and some currently not deemed to be material could become so.

Changes to Risk in 2022

The Board believes that there has been no material change to the Group's principal risks and uncertainties during the year to date. However, as in previous years, a number of issues identified in the Group's principal risks and uncertainties have materialised in the first half of the year. These are most notably:

- End Market Risk: The Board continues to monitor the implications of the changing global economic environment, with short term forecasts for steel volumes and automotive output having been revised downwards (despite the longer term growth trend continuing). The implications of inflation (seen most notably in energy prices) and interest rate increases are closely monitored, particularly as the effects are not universal across the globe with some of our jurisdictions suffering much higher inflationary pressures than others, impacting our staff and the cost base of our business.

- Health & Safety/Business Interruption: Whilst the effects of the Covid pandemic have receded in many places, the Board is still keenly focused on managing the risks this poses, both for the health and safety of our employees and the effects on our business. The impact of Covid continues to bring some uncertainty, particularly in jurisdictions where specific lockdowns can still be imposed, which could affect our manufacturing base and ability to operate as well as that of our customers.

- Protectionism and Globalisation: As set out elsewhere in this release, at the time of writing, there is political uncertainty regarding the sustainability of gas supplies from Russia into Europe over the coming months, which could impact both our operations and those of our customers. We have been reviewing possible scenarios and have put in place mitigation plans to support our operations in Europe, including, if necessary, the mobilisation of available production capacity in India, Mexico, Middle East and China. As a result, we anticipate that we will be able to continue providing essential products and services to our European customers even in case of a complete cessation of Russian gas imports. Furthermore, as our most energy intensive European based manufacturing processes were closed or transferred out of Europe in the framework of our European footprint restructuring two years ago, our exposure to rising European energy prices is now relatively limited.

Climate Change
The Group's overall risk management processes also incorporate consideration of the potential impact of climate-related risks on the Group. The Group does not regard climate change itself to represent a material stand-alone risk for the Group's operations. Whilst a significant proportion of the Group's revenue is generated from Steel manufacture and automotive castings, industries that are under transition as a result of their focus on improving environmental performance, we believe these changes will be positive for the Group. The opportunities in the Group's business strategy, which is founded on helping our customers to improve their manufacturing efficiency and the quality of their products – and therefore reduce their climate impact – will play a critical part in the development of the Group going forward. The Group recognises that climate change could present further uncertainty for the Group in terms of increased regulation, evolution of the geographical distribution of our customer base and the costs of meeting more onerous disclosure requirements. The risks we associate with our sustainability performance and our end customers' sustainability transition – badged as ESG – are identified as a separate element of the Group risk register, recognising the work Vesuvius can do to mitigate the environmental impact of our customers' processes. Other elements of this risk are incorporated into the appropriate Principal Risk and Uncertainties that the Group has identified. The Group continues to focus internally on the action we can take to drive our business' sustainability. In the first half of 2022, the Group made further progress on its sustainability KPIs and continued work on the Sustainability initiative announced in 2020. Under this initiative the Group will seek to drive a lower CO_2 intensity, reduce energy usage, and take the steps necessary to meet the target set of being emissions net zero by 2050.

Principal risks and uncertainties:

Risk	Potential impact	Mitigation
End market risks *Vesuvius suffers an unplanned drop in demand, revenue and/ or margin because of market volatility beyond its control*	• Unplanned drop in demand and/or revenue due to reduced production by our customers • Margin reduction • Customer failure leading to increased bad debts • Loss of market share to competition • Cost pressures at customers leading to use of cheaper solutions	• Geographic diversification of revenues • Product innovation and service offerings securing long-term revenue streams and maintaining performance differential • Increase in service and product lines by the development of the Technical Services offering • R&D includes assessment of emerging technologies • Manufacturing capacity rationalisation and flexible cost base • Diversified customer base: no customer is greater than 10% of revenue • Robust credit and working capital control to mitigate the risk of default by counterparties
Protectionism and globalisation *The Vesuvius business model cannot adapt or respond quickly enough to threats from protectionism and globalisation*	• Restricted access to market due to enforced preference of local suppliers • Increased barriers to entry for new businesses or expansion • Increased costs from import duties, taxation or tariffs • Loss of market share • Trade restrictions	• Highly diversified manufacturing footprint with manufacturing sites located in 26 countries • Strong local management with delegated authority to run their businesses and manage customer relationships • Cost flexibility • Tax risk management and control framework together with a strong control of inter-company trading

Product quality failure *Vesuvius staff/contractors are injured at work or customers, staff or third parties suffer physical injury or financial loss because of failures in Vesuvius products*	• Injury to staff and contractors • Product or application failures lead to adverse financial impact or loss of reputation as technology leader • Incident at customer plant caused manufacturing downtime or damage to infrastructure • Customer claims from product quality issues	• Quality management programmes including stringent quality control standards, monitoring and reporting • Experienced technical staff knowledgeable in the application of our products and technology • Targeted global insurance programme • Experienced internal legal function controlling third-party contracting
Complex and changing regulatory environment *Vesuvius experiences a contracting customer base or increased transaction and administrative costs due to compliance with changing regulatory requirements*	• Revenue reduction from reduced end-market access • Disruption of supply chain and route to market • Increased internal control processes • Increased frequency of regulatory investigations • Reputational damage	• Compliance programmes and training across the Group • Internal Audit function • Experienced internal legal function including dedicated compliance specialists • Global procurement category management of strategic raw materials
Failure to secure innovation *Vesuvius fails to achieve continuous improvement in its products, systems and services*	• Product substitution by customers • Increased competitive pressure through lack of differentiation of Vesuvius offering • Commoditisation of product portfolio through lack of development • Lack of response to changing customer needs • Loss of intellectual property protection	• Enduring and significant investment in R&D, with market-leading research • A shared strategy for innovation throughout the Group, deployed via our R&D centres • Stage gate process from innovation to commercialisation to foster innovation and increase alignment with strategy • Programme of manufacturing and process excellence • Quality programme, focused on quality and consistency • Stringent intellectual property registration and defence
Business interruption *Vesuvius loses production capacity or experiences supply chain disruption due to physical site damage (accident, fire, natural disaster, terrorism) or other events such as industrial action, cyber attack or global health crises*	• Loss/closure of a major plant temporarily or permanently impairing our ability to serve our customers • Damage to or restriction in our ability to use assets • Denial of access to critical systems or control processes • Disruption of manufacturing processes • Inability to source critical raw materials	• Diversified manufacturing footprint • Disaster recovery planning • Business continuity planning with strategic maintenance of excess capacity • Physical and IT control systems security, access and training • Cyber risks integrated into wider risk-management structure • Well-established global insurance programme • Group-wide safety management programmes • Dual sourcing strategy and development of substitutes

People, culture and performance *Vesuvius is unable to attract and retain the right calibre of staff, fails to instil an appropriate culture or fails to embed the right systems to drive personal performance in pursuit of the Group's long-term growth*	• Organisational culture of high performance is not achieved • Staff turnover in growing economies and regions • Stagnation of ideas and development opportunities • Loss of expertise and critical business knowledge • Reduced management pipeline for succession to senior positions	• Internal focus on talent development and training, with tailored career-stage programmes and clear performance management strategies • Contacts with universities to identify and develop talent • Career path planning and global opportunities for high-potential staff • Internal programmes for the structured transfer of technical and other knowledge • Clearly defined Values underpin business culture
Health and safety *Vesuvius staff or contractors are injured at work because of failures in Vesuvius' operations, equipment or processes*	• Injury to staff and contractors • Health and safety breaches • Manufacturing downtime or damage to infrastructure from incident at plant • Inability to attract the necessary workforce • Reputational damage	• Active safety programmes, with ongoing wide-ranging monitoring and safety training • Independent safety audit team • Quality management programmes including stringent manufacturing process control standards, monitoring and reporting
Environmental, social and governance (ESG) criteria *Vesuvius fails to capitalise on the opportunity to help its customers significantly reduce their carbon emissions as environmental pressure grows on the Steel Industry or Vesuvius fails to meet the expectations of its various stakeholders including employees and investors*	• Loss of opportunity to grow sales • Loss of opportunity to increase margin • Loss of stakeholder confidence including Investors • Reputational damage	• Development and implementation of a new Sustainability initiative, which includes stretching targets focused on reducing the Group's Energy usage, CO2 emissions, waste and recycled materials • R&D focus on products that assist customers to reduce carbon emissions and improve their own sustainability measures • Skilled technical sales force to develop efficient solutions for our customers • Globally disseminated Code of Conduct sets out standards of conduct expected and ABC Policy adopted with a zero tolerance regarding bribery and corruption • Internal Speak up mechanisms to allow reporting of concerns • Extensive use of due diligence to assess existing and potential business partners and customers

Half Year Results for the six months ended 30 June 2022
Directors' responsibility statement

We confirm that to the best of our knowledge:

(a) The Condensed Group Financial Statements have been prepared in accordance with UK adopted International Accounting Standard 34, 'Interim Financial Reporting' and give a true and fair view of the assets, liabilities, financial position and profit or loss of the Group as required by DTR 4.2.4 R; and

(b) This half-yearly financial report includes a fair review of the information required by:

- DTR 4.2.7R of the Disclosure and Transparency Rules, being an indication of important events that have occurred during the first six months of the financial year and their impact on the condensed set of financial statements; and a description of the principal risks and uncertainties for the remaining six months of the financial year; and
- DTR 4.2.8R of the Disclosure and Transparency Rules, being related parties' transactions that have taken place in the first six months of the current financial year and that have materially affected the financial position or the performance of the Group during that period; and any changes in the related parties' transactions described in the last Annual Report that could do so.

The names and functions of the Directors of Vesuvius plc are as follows:

John McDonough CBE	Chairman
Patrick André	Chief Executive
Guy Young	Chief Financial Officer
Douglas Hurt	Non-executive Director, Senior Independent Director and Chairman of the Audit Committee
Kath Durrant	Non-executive Director and Chairman of the Remuneration Committee
Dinggui Gao	Non-executive Director
Friederike Helfer	Non-executive Director
Jane Hinkley	Non-executive Director

On behalf of the Board

Guy Young
Chief Financial Officer
27 July 2022

Independent review report to Vesuvius plc
Report on the Condensed Group Financial Statements

Our conclusion

We have reviewed Vesuvius plc's condensed consolidated interim financial statements (the "interim financial statements") in the Half Year Results of Vesuvius plc for the 6 month period ended 30 June 2022 (the "period").

Based on our review, nothing has come to our attention that causes us to believe that the interim financial statements are not prepared, in all material respects, in accordance with UK adopted International Accounting Standard 34, 'Interim Financial Reporting' and the Disclosure Guidance and Transparency Rules sourcebook of the United Kingdom's Financial Conduct Authority.

The interim financial statements comprise:

- the Condensed Group Balance Sheet as at 30 June 2022;
- the Condensed Group Income Statement and Condensed Group Statement of Comprehensive Income for the period then ended;
- the Condensed Group Statement of Cash Flows for the period then ended;
- the Condensed Group Statement of Changes in Equity for the period then ended; and
- the explanatory notes to the interim financial statements.

The interim financial statements included in the Half Year Results of Vesuvius plc have been prepared in accordance with UK adopted International Accounting Standard 34, 'Interim Financial Reporting' and the Disclosure Guidance and Transparency Rules sourcebook of the United Kingdom's Financial Conduct Authority.

Basis for conclusion

We conducted our review in accordance with International Standard on Review Engagements (UK) 2410, 'Review of Interim Financial Information Performed by the Independent Auditor of the Entity' issued by the Financial Reporting Council for use in the United Kingdom. A review of interim financial information consists of making enquiries, primarily of persons responsible for financial and accounting matters, and applying analytical and other review procedures.

A review is substantially less in scope than an audit conducted in accordance with International Standards on Auditing (UK) and, consequently, does not enable us to obtain assurance that we would become aware of all significant matters that might be identified in an audit. Accordingly, we do not express an audit opinion.

We have read the other information contained in the Half Year Results and considered whether it contains any apparent misstatements or material inconsistencies with the information in the interim financial statements.

Conclusions relating to going concern

Based on our review procedures, which are less extensive than those performed in an audit as described in the Basis for conclusion section of this report, nothing has come to our attention to suggest that the directors have inappropriately adopted the going concern basis of accounting or that the directors have identified material uncertainties relating to going concern that are not appropriately disclosed. This conclusion is based on the review procedures performed in accordance with this ISRE. However, future events or conditions may cause the group to cease to continue as a going concern.

Responsibilities for the interim financial statements and the review

Our responsibilities and those of the directors

The Half Year Results, including the interim financial statements, is the responsibility of, and has been approved by the directors. The directors are responsible for preparing the Half Year Results in accordance with the Disclosure Guidance and Transparency Rules sourcebook of the United Kingdom's Financial Conduct Authority. In preparing the Half Year Results, including the interim financial statements, the directors are responsible for assessing the group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors either intend to liquidate the group or to cease operations, or have no realistic alternative but to do so.

Our responsibility is to express a conclusion on the interim financial statements in the Half Year Results based on our review. Our conclusion, including our Conclusion relating to going concern, is based on procedures that are less extensive than audit procedures, as described in the Basis for conclusion paragraph of this report. This report, including the conclusion, has been prepared for and only for the company for the purpose of complying with the Disclosure Guidance and Transparency Rules sourcebook of the United Kingdom's Financial Conduct Authority and for no other purpose. We do not, in giving this conclusion, accept or assume responsibility for any other purpose or to any other person to whom this report is shown or into whose hands it may come save where expressly agreed by our prior consent in writing.

PricewaterhouseCoopers LLP
Chartered Accountants
London
27 July 2022

Condensed Group Income Statement

For the six months ended 30 June 2022

Continuing operations	Notes	**Half year 2022 (Unaudited)** Headline performance[1] £m	Separately reported items[1] £m	Total £m	Half year 2021 (Unaudited) Headline performance[1] £m	Separately reported items[1] £m	Total £m	Full year 2021 Headline performance[1] £m	Separately reported items[1] £m	Total £m
Revenue	2	**1,015.9**	**-**	**1,015.9**	808.1	-	808.1	1,642.9	-	1,642.9
Manufacturing costs		**(718.0)**	**-**	**(718.0)**	(592.6)	-	(592.6)	(1,222.8)	-	(1,222.8)
Administration, selling & distribution costs		**(170.5)**	**-**	**(170.5)**	(142.2)	-	(142.2)	(277.7)	-	(277.7)
Trading profit[2]	2	**127.4**	**-**	**127.4**	73.3	-	73.3	142.4	-	142.4
Amortisation of acquired intangible assets		**-**	**(5.1)**	**(5.1)**	-	(4.8)	(4.8)	-	(9.7)	(9.7)
Operating profit/(loss)	2	**127.4**	**(5.1)**	**122.3**	73.3	(4.8)	68.5	142.4	(9.7)	132.7
Finance expense		(9.2)	-	(9.2)	(6.2)	-	(6.2)	(13.7)	-	(13.7)
Finance income		2.6	-	2.6	2.6	-	2.6	7.3	-	7.3
Net finance costs	3	**(6.6)**	**-**	**(6.6)**	(3.6)	-	(3.6)	(6.4)	-	(6.4)
Share of post-tax profit of joint ventures and associates		**1.0**	**-**	**1.0**	0.6	-	0.6	1.3	-	1.3
Profit/(loss) before tax	2	**121.8**	**(5.1)**	**116.7**	70.3	(4.8)	65.5	137.3	(9.7)	127.6
Income tax (charge)/credits	4	**(33.2)**	**1.4**	**(31.8)**	(18.5)	(0.7)	(19.2)	(35.9)	16.2	(19.7)
Profit/(loss)		**88.6**	**(3.7)**	**84.9**	51.8	(5.5)	46.3	101.4	6.5	107.9
Profit/(loss) attributable to:										
Owners of the parent		**84.7**	**(3.7)**	**81.0**	48.5	(5.5)	43.0	95.6	6.5	102.1
Non-controlling interests		**3.9**	**-**	**3.9**	3.3	-	3.3	5.8	-	5.8
Profit/(loss)		**88.6**	**(3.7)**	**84.9**	51.8	(5.5)	46.3	101.4	6.5	107.9
Earnings per share — pence	5									
— basic				**30.0**			15.9			37.7
— diluted				**29.8**			15.8			37.5

(1) *Headline performance and Separately reported items are non-GAAP measures. Headline performance is defined in Note 15.1 and Separately reported items are defined in Note 1.5.*

(2) *Trading profit is a non-GAAP measure and is defined in Note 15.4.*

The above results were derived from continuing operations. The separately reported items would form part of Administration, selling & distribution costs if classified within headline performance, which including these amounts would total £175.6m (2021 half year: £147.0m, 2020 full year: £287.4m).

Condensed Group Statement of Comprehensive Income

For the six months ended 30 June 2022

	Notes	**Unaudited Half year 2022 £m**	Unaudited Half year 2021 £m	Full year 2021 £m
Profit		**84.9**	46.3	107.9
Items that will not subsequently be reclassified to income statement:				
Remeasurement of defined benefit assets/liabilities		**27.9**	8.5	(80.6)
Income tax relating to items not reclassified	4	**(7.9)**	(9.6)	12.5
Items that may subsequently be reclassified to income statement:				
Exchange differences on translation of the net assets of foreign Operations		**100.4**	(28.8)	(31.4)
Exchange differences arising on translation of net investment hedges		**(11.6)**	10.3	14.4
Net change in costs of hedging		**-**	(0.3)	(1.2)
Change in the fair value of the hedging instrument		**6.8**	(0.2)	2.2
Amounts reclassified from the income statement		**(7.1)**	0.7	(0.7)
Other comprehensive income (loss), net of income tax		**108.5**	(19.4)	(84.8)
Total comprehensive income		**193.4**	26.9	23.1
Total comprehensive income attributable to:				
Owners of the parent		**186.9**	24.9	17.7
Non-controlling interests		**6.5**	2.0	5.4
Total comprehensive income		**193.4**	26.9	23.1

The above results were derived from continuing operations.

Condensed Group Statement of Cash Flows

For the six months ended 30 June 2022

	Notes	**Unaudited Half year 2022 £m**	Unaudited Half year 2021 £m	Full year 2021 £m
Cash flows from operating activities				
Cash generated from operations	8	**69.0**	50.2	82.9
Interest paid		**(7.4)**	(5.5)	(11.9)
Interest received		**2.1**	2.1	4.3
Income taxes paid		**(23.6)**	(13.7)	(30.1)
Net cash inflow from operating activities		**40.1**	33.1	45.2
Cash flows from investing activities				
Capital expenditure		**(38.6)**	(17.6)	(45.5)
Proceeds from the sale of property, plant and equipment		**1.3**	0.6	1.2
Acquisition of subsidiaries and joint ventures, net of cash acquired	12	**0.5**	-	(43.7)
Dividends received from joint ventures		**-**	1.0	1.0
Net cash outflow from investing activities		**(36.8)**	(16.0)	(87.0)
Net cash inflow/(outflow) before financing activities		**3.3**	17.1	(41.8)
Cash flows from financing activities				
Proceeds from borrowings	7	**50.1**	-	89.4
Repayment of borrowings	7	**(9.1)**	(22.5)	(31.4)
Purchase of ESOP Shares		**(1.9)**	-	(1.1)
Dividends paid to equity shareholders	6	**(40.5)**	(38.7)	(55.5)
Dividends paid to non-controlling shareholders		**(1.3)**	(0.7)	(2.2)
Net cash (outflow) from financing activities		**(2.7)**	(61.9)	(0.8)
Net (decrease)/increase in cash and cash equivalents	7	**0.6**	(44.8)	(42.6)
Cash and cash equivalents at 1 January		**162.4**	206.8	206.8
Effect of exchange rate fluctuations on cash and cash equivalents		**9.2**	(4.0)	(1.8)
Cash and cash equivalents at the end of the reporting period		**172.2**	158.0	162.4
Free cash flow	15.11			
Net cash inflow from operating activities		**40.1**	33.1	45.2
Capital expenditure		**(38.6)**	(17.6)	(45.5)
Proceeds from the sale of property, plant and equipment		**1.3**	0.6	1.2
Dividends received from joint ventures		**-**	1.0	1.0
Dividends paid to non-controlling shareholders		**(1.3)**	(0.7)	(2.2)
Free cash flow[1]	15.11	**1.5**	16.4	(0.3)

(1) *For definitions of alternative performance measures, refer to Note 15*

Condensed Group Balance Sheet

As at 30 June 2022

	Notes	**Unaudited Half year 2022 £m**	Unaudited Half year 2021 £m	Full year 2021 £m
Assets				
Property, plant and equipment		**380.2**	325.1	352.5
Intangible assets		**732.6**	675.5	696.8
Employee benefits – surpluses	9	**24.5**	113.2	25.1
Interests in joint ventures and associates		**14.5**	11.6	12.8
Investments		**0.8**	0.9	0.5
Deferred tax assets		**94.8**	84.9	104.2
Other receivables		**18.8**	17.7	16.2
Derivative financial instruments	14	**3.1**	-	-
Total non-current assets		**1,269.3**	1,228.9	1,208.1
Cash and short-term deposits	7	**177.2**	162.1	169.1
Inventories		**360.7**	236.9	299.4
Trade and other receivables		**547.1**	410.2	445.2
Income tax receivable		**2.3**	1.8	7.6
Derivative financial instruments	14	**0.2**	-	0.1
Assets classified as held for sale		**-**	0.9	-
Total current assets		**1,087.5**	811.9	921.4
Total assets		**2,356.8**	2,040.8	2,129.5

Condensed Group Balance Sheet (continued)

As at 30 June 2022

	Notes	**Unaudited Half year 2022 £m**	Unaudited Half year 2021 £m	Full year 2021 £m
Equity				
Issued share capital		**27.8**	27.8	27.8
Retained earnings		**2,545.5**	2,508.1	2,483.4
Other reserves		**(1,381.7)**	(1,468.3)	(1,467.6)
Equity attributable to the owners of the parent		**1,191.6**	1,067.6	1,043.6
Non-controlling interests		**59.8**	52.7	54.6
Total equity		**1,251.4**	1,120.3	1,098.2
Liabilities				
Interest-bearing borrowings	7	**348.2**	273.1	329.9
Employee benefits - liabilities	9	**78.5**	102.3	102.1
Other payables		**7.8**	9.4	11.6
Provisions	13	**36.0**	32.4	32.6
Income tax liabilities		**-**	-	-
Deferred tax liabilities		**28.9**	49.7	29.6
Derivative financial instruments	14	**-**	5.0	2.5
Total non-current liabilities		**499.4**	471.9	508.3
Interest-bearing borrowings	7	**159.8**	80.4	113.8
Trade and other payables		**416.8**	341.7	372.9
Income tax payable		**11.9**	9.2	18.1
Provisions	13	**17.3**	17.2	18.1
Derivative financial instruments	14	**0.2**	0.1	0.1
Total current liabilities		**606.0**	448.6	523.0
Total liabilities		**1,105.4**	920.5	1,031.3
Total equity and liabilities		**2,356.8**	2,040.8	2,129.5

Condensed Group Statement of Changes in Equity

For the six months ended 30 June 2022

	Issued share capital £m	Other reserves £m	Retained earnings £m	Owners of the parent £m	Non-controlling interests £m	Total equity £m
As at 1 January 2022	**27.8**	**(1,467.6)**	**2,483.4**	**1,043.6**	**54.6**	**1,098.2**
Profit	**-**	**-**	**81.0**	**81.0**	**3.9**	**84.9**
Remeasurement of defined benefit assets/liabilities	-	-	**27.9**	**27.9**	-	**27.9**
Income tax relating to items not reclassified	-	-	**(7.9)**	**(7.9)**	-	**(7.9)**
Exchange differences on translation of the net assets of foreign operations	-	**97.8**	-	**97.8**	**2.6**	**100.4**
Exchange differences arising on translation of net investment hedges	-	**(11.6)**	-	**(11.6)**	-	**(11.6)**
Net change in costs of hedging	-	-	-	-	-	-
Change in the fair value of the hedging instrument	-	**6.8**	-	**6.8**	-	**6.8**
Amounts reclassified from the income statement	-	**(7.1)**	-	**(7.1)**	-	**(7.1)**
Other comprehensive income/(loss), net of income tax	**-**	**85.9**	**20.0**	**105.9**	**2.6**	**108.5**
Total comprehensive income/(loss)	**-**	**85.9**	**101.0**	**186.9**	**6.5**	**193.4**
Recognition of share-based payments	-	-	**3.5**	**3.5**	-	**3.5**
Purchase of ESOP shares	-	-	**(1.9)**	**(1.9)**	-	**(1.9)**
Dividends paid (Note 6)	-	-	**(40.5)**	**(40.5)**	**(1.3)**	**(41.8)**
Total transactions with owners	**-**	**-**	**(38.9)**	**(38.9)**	**(1.3)**	**(40.2)**
As at 30 June 2022	**27.8**	**(1,381.7)**	**2,545.5**	**1,191.6**	**59.8**	**1,251.4**

	Issued share capital £m	Other reserves £m	Retained earnings £m	Owners of the parent £m	Non-controlling interests £m	Total equity £m
As at 1 January 2021	**27.8**	**(1,451.3)**	**2,502.9**	**1,079.4**	**51.4**	**1,130.8**
Profit	**-**	**-**	**43.0**	**43.0**	**3.3**	**46.3**
Remeasurement of defined benefit liabilities/assets	-	-	8.5	8.5	-	8.5
Income tax relating to items not reclassified	-	-	(9.6)	(9.6)	-	(9.6)
Exchange differences on translation of the net assets of foreign operations	-	(27.5)	-	(27.5)	(1.3)	(28.8)
Exchange differences arising on translation of net investment hedges	-	10.3	-	10.3	-	10.3
Net change in costs of hedging	-	(0.3)	-	(0.3)	-	(0.3)
Change in the fair value of the hedging instrument	-	(0.2)	-	(0.2)	-	(0.2)
Amounts reclassified from the Income Statement	-	0.7	-	0.7	-	0.7
Other comprehensive income/(loss), net of income tax	-	(17.0)	(1.1)	(18.1)	(1.3)	(19.4)
Total comprehensive income/(loss)	-	(17.0)	41.9	24.9	2.0	26.9
Recognition of share-based payments	-	-	2.0	2.0	-	2.0
Dividends paid (Note 6)	-	-	(38.7)	(38.7)	(0.7)	(39.4)
Total transactions with owners	-	-	(36.7)	(36.7)	(0.7)	(37.4)
As at 30 June 2021	**27.8**	**(1,468.3)**	**2,508.1**	**1,067.6**	**52.7**	**1,120.3**

Notes to the Condensed Group Financial Statements

Basis of preparation

1.1 Basis of accounting

These Condensed Group Financial Statements of Vesuvius plc ("Vesuvius" or the "Company") and its subsidiary and joint venture companies (the "Group") have been prepared in accordance with UK adopted International Accounting Standard 34, 'Interim Financial Reporting' and the Disclosure Guidance and Transparency Rules sourcebook of the United Kingdom's Financial Conduct Authority.

These Condensed Group Financial Statements have been prepared using the same accounting policies as used in the preparation of the Group's Annual financial statements for the year ended 31 December 2021, except for taxes on income in the interim period which are accrued using the tax rate that would be applicable to the expected total annual profit or loss. The assessment of the Group's critical accounting estimates and judgements remain consistent with the 2021 Annual Report and Financial Statements. The Group's Annual report and financial statements for the year ended 31 December 2021 were prepared in accordance with UK-adopted international accounting standards (IFRS) and the requirements of the Companies Act 2006.

The Condensed Group Financial Statements do not include all of the information required for full annual financial statements, and should be read in conjunction with the consolidated financial statements of the Group for the year-ended 31 December 2021. The financial information presented in this document is unaudited but has been reviewed by the Company's auditor.

The comparative figures for the financial year ended 31 December 2021 are not the Group's statutory accounts for that financial year but have been extracted from those accounts. Those accounts have been reported on by the Company's auditor and delivered to Companies House. The report of the auditor was unqualified, did not include reference to any matters to which the auditor drew attention by way of emphasis without qualifying its report and did not contain a statement under section 498(2) or (3) of the Companies Act 2006. These sections address whether proper accounting records have been kept, whether the Company's accounts are in agreement with those records and whether the auditor has obtained all the information and explanations necessary for the purposes of its audit.

1.2 Basis of consolidation

The Condensed Group Financial Statements incorporate the financial statements of the Company and entities controlled by the Company (its "subsidiaries"). Control exists when the Company has the power to direct the relevant activities of an entity that significantly affect the entity's return so as to have rights to the variable return from its activities. In assessing whether control exists, potential voting rights that are currently exercisable are taken into account. The results of subsidiaries acquired or disposed of during the year are included in the Condensed Group Income Statement from the effective date of acquisition or up to the effective date of disposal, as appropriate.

The principal accounting policies applied in the preparation of these Condensed Group Financial Statements are set out in the Notes. These policies have been consistently applied to all of the years presented, unless otherwise stated. Where necessary, adjustments are made to the financial statements of subsidiaries to bring their accounting policies into line with those detailed herein to ensure that the Condensed Group Financial Statements are prepared on a consistent basis. All intra-Group transactions, balances, income and expenses are eliminated on consolidation.

Non-controlling interests in the net assets of consolidated subsidiaries are identified separately from the Group's interest therein. Non-controlling interests consist of the amount of those interests at the date of the original business combination together with the non-controlling interests' share of profit or loss and each component of other comprehensive income less their dividends since the date of the combination. Their share of comprehensive income/(loss) is attributed to the non-controlling interests even if this results in the non-controlling interests having a deficit balance.

1.3 Going concern

The Directors have prepared cash flow scenarios for the Group for a period at least 12 months from the date of approval of the 2022 Interim Condensed Financial Statements. These forecasts reflect an assessment of current and future end market conditions, including the impact of covid-related lockdowns in China and war in Ukraine, and their impact on the Group's future trading performance. The analysis undertaken includes a severe but plausible downside scenario which assumes a decline in business activity and profitability in H2 2022 to the level achieved in H2 2020. Relative to H1 2022, this implies an c.30% decline in sales and a c.60% decline in Trading Profit, with no improvement from this level assumed in 2023. Even in this downside scenario, the forecasts show that the Group's maximum net debt / EBITDA (pre-IFRS 16 in-line with the covenant calculation) does not exceed 1.0x, compared to a leverage covenant of 3.25x.

On the basis of the exercise described above and the Group's available committed liquidity which stands at £416m at 30 June 2022, the Directors consider that the Group and the Company have adequate resources to continue in operational existence for a period of at least 12 months from the date of signing of these Interim Condensed Financial Statements. Accordingly, they continue to adopt a going concern basis in preparing the Condensed Financial statements of the Group and the Company.

1.4 Functional and presentational currency

The financial statements are presented in millions of pounds sterling, which is the functional currency of the Company, and rounded to one decimal place.

1.5 Disclosure of "separately reported items"

Columnar presentation

The Group has adopted a columnar presentation for its Condensed Group Income Statement, to separately identify headline performance results, as the Directors consider that this gives a useful view of the underlying results of the ongoing business. As part of this presentation format, the Group has adopted a policy of disclosing separately on the face of its Group Income Statement, within the column entitled 'Separately reported items', the effect of any components of financial performance for which the Directors consider separate disclosure would assist users both in a useful understanding of the financial performance achieved for a given year and in making projections of future results.

Separately reported items

Both materiality and the nature of the components of income and expense are considered in deciding upon such presentation. Such items may include, inter alia, the financial effect of exceptional items which occur infrequently, such as major restructuring activity (which may require more than one year to complete), significant movement in the Group's deferred tax balances such as was, for example, caused by the impact of US tax reform in 2017, items reported separately for consistency, such as amortisation charges relating to acquired intangible assets, profits or losses arising on the disposal of continuing or discontinued operations and the taxation impact of the aforementioned items reported separately.

The amortisation charge in respect of intangible assets recognised on business combinations is excluded from the trading results of the Group since they are non-cash charges and are not considered reflective of the core trading performance of the Group.

In its adoption of this policy, the Company applies an even-handed approach to both gains and losses and aims to be both consistent and clear in its accounting and disclosure of such items.

1.6 New and revised IFRS

Certain new accounting standards and interpretations have been published that are applicable for periods commencing 1 January 2022 and others that are not mandatory for reporting periods commencing on 1 January 2022 and have not been early adopted by the Group. The Group's assessment of the impact of these new standards and interpretations is that they are not expected to have a significant impact on the Group's financial position, performance, cash flows and disclosures.

Benchmark reform

The replacement of Libor with alternative interest rate benchmarks is now well progressed and the Group has reviewed the impact of this on its financial statements.

The £385m central bank facility signed on 5 July 2021 provides for the use of SONIA and EURIBOR for GBP and EUR drawdowns respectively. USD Libor remains quoted until June 2023; a replacement reference rate for USD drawdowns will be agreed by that date as provided for within the terms of the facility.

The Group's US private placement notes and cross currency interest rate swaps are not exposed to Libor rates and as a result are unaffected by the benchmark reform. The Group's £19m bi-lateral loan agreement was amended in October 2021 with GBP Libor replaced by SONIA.

The Group concludes that benchmark reform has no material impact on its financial statements. The Group also confirms it has made no changes to its risk management strategy as a result of benchmark reform.

Hyperinflationary accounting in Turkey

Turkey became a hyperinflationary economy from 1 April 2022 and IAS 29 'Financial Reporting in Hyperinflationary Economies' is effective for periods ending on or after 30 June 2022. The group operates in Turkey through its subsidiary, Vesuvius Istanbul Sanayi ve Ticaret AS.

The standard applies retrospectively and impact assessments for the year ended 31 December 2021 and period ended 30 June 2022 have been completed. We have concluded that the impact of hyperinflation in Turkey is not material for adjustment as at 1 January 2022 and for the half year results to 30 June 2022.

2 Segment information

Operating segments for continuing operations

The Group's operating segments are determined taking into consideration how the Group's components are reported to the Group's Chief Executive Officer, who makes the key operating decisions and is responsible for allocating resources and assessing performance of the components. Taking into account the Group's management and internal reporting structure, the operating segments are Steel Flow Control, Steel Advanced Refractories, Steel Sensors & Probes and the Foundry Division. The principal activities of each of these segments are described in the Operational Review.

Steel Flow Control, Steel Advanced Refractories and Steel Sensors & Probes operating segments are aggregated into the Steel reportable segment. In determining that aggregation is appropriate, judgement is applied which takes into account the economic characteristics of these operating segments which include a similar nature of products, customers, production processes and margins.

Revenue from contracts with customers
Revenue comprises the fair value of the consideration received or receivable for goods supplied and services rendered to customers after deducting rebates, discounts and value-added taxes, and after eliminating sales within the Group. Revenue from contracts with customers is recognised when control of the goods or services are transferred to the customer, upon the completion of specified performance obligations, at an amount that reflects the considerations to which the Group expects to be entitled to in exchange for these consumable products and associated services.

The revenue recognition policy applicable to the current and comparative periods and information about the Group's performance obligations was disclosed in Note 5 of the 2021 Annual Report and Financial Statements.

Segmental analysis

	Unaudited Half Year 2022					
	Flow Control	Advanced Refractories	Sensors & Probes	**Steel**	**Foundry**	**Total**
				£m	**£m**	**£m**
Segment revenue	402.6	320.8	20.6	744.0	271.9	1,015.9
at a point in time				*743.3*	*271.9*	*1,015.2*
Over time				*0.7*	*-*	*0.7*
Segment adjusted EBITDA *				119.5	34.1	153.6
Segment depreciation				(17.8)	(8.4)	(26.2)
Segment trading profit				101.7	25.7	127.4
Return on sales #				*13.7%*	*9.5%*	*12.5%*
Amortisation of acquired intangible assets						(5.1)
Operating profit						122.3
Net finance costs						(6.6)
Share of post-tax profit of joint ventures						1.0
Profit before tax						116.7
Capital expenditure additions				33.2	5.0	38.2
Inventory				296.7	64.0	360.7
Trade debtors				334.2	103.9	438.1
Trade creditors				(210.3)	(68.6)	(278.9)

Notes to the Condensed Group Financial Statements

2 Segment information (continued)

	Unaudited Half Year 2021					
	Flow Control	Advanced Refractories	Sensors & Probes	**Steel**	**Foundry**	**Total**
				£m	**£m**	**£m**
Segment revenue	315.5	238.6	16.2	570.3	237.8	808.1
at a point in time				*567.4*	*237.8*	*805.2*
Over time				*2.9*	*-*	*2.9*
Segment adjusted EBITDA *				66.0	31.8	97.8
Segment depreciation				(16.6)	(7.9)	(24.5)
Segment trading profit				49.4	23.9	73.3
Return on sales #				*8.7%*	*10.1%*	*9.1%*
Amortisation of acquired intangible assets						(4.8)
Operating profit						68.5
Net finance costs						(3.6)
Share of post-tax profit of joint ventures						0.6
Profit before tax						65.5
Capital expenditure additions				16.1	4.5	20.6
Inventory				189.2	47.7	236.9
Trade debtors				248.2	89.8	338.0
Trade creditors				(162.7)	(64.7)	(227.4)

	Full Year 2021					
	Flow Control	Advanced Refractories	Sensors & Probes	**Steel**	**Foundry**	**Total**
				£m	**£m**	**£m**
Segment revenue	648.7	489.1	33.7	1,171.5	471.4	1,642.9
at a point in time				1,169.9	471.4	1,641.3
Over time				1.6	-	1.6
Segment adjusted EBITDA *				135.9	56.3	192.2
Segment depreciation				(33.9)	(15.9)	(49.8)
Segment trading profit				102.0	40.4	142.4
Return on sales #				*8.7%*	*8.6%*	*8.7%*
Amortisation of acquired intangible assets						(9.7)
Operating profit						132.7
Net finance costs						(6.4)
Share of post-tax profit of joint ventures						1.3
Profit before tax						127.6
Capital expenditure additions				47.2	20.2	67.4
Inventory				248.1	51.3	299.4
Trade debtors				267.5	84.7	352.2
Trade creditors				(191.3)	(62.5)	(253.8)

Return on sales is defined in note 15.3
* Adjusted EBITDA is defined in note 15.13

3 Net finance costs

	Unaudited Half year 2022 £m	Unaudited Half year 2021 £m	Full year 2021 £m
Interest payable on borrowings			
Loans and overdrafts	**6.7**	5.0	10.7
Interest on lease liabilities	**0.8**	0.7	1.5
Amortisation of capitalised arrangement costs	**0.5**	0.1	0.8
Total interest payable on borrowings	**8.0**	5.8	13.0
Interest on net retirement benefits obligations	**0.7**	(0.1)	(0.3)
Adjustments to discounts on provisions and other liabilities	**0.5**	0.4	0.7
Adjustments to discounts on receivables	**(0.3)**	(0.2)	(0.3)
Finance income	**(2.3)**	(2.3)	(6.7)
Total net finance costs	**6.6**	3.6	6.4

Within the table above, total finance costs are £9.2m (2021 half year: £6.2m, 2021 full year: £13.7m) and total finance income is £2.6m (2021 half year: £2.6m, 2021 full year: £7.3m).

4 Income tax

A key measure of the Group's tax burden is the headline effective tax rate, which the Group calculates on the income tax associated with headline performance, divided by the headline profit before tax excluding the Group's share of post-tax profit of joint ventures. The Group's headline effective tax rate was in-line with expectations at 27.5% in H1 2022 (2021: half year 26.5%; full year 26.4%) based on the income tax costs associated with headline performance of £33.2m (2021: half year £18.5m; full year £35.9m).

The Group's total income tax costs include a credit of £1.4m (2021 half year: £0.7m debit; 2021 full year: £16.2m credit) relating to separately reported items comprising a credit of £nil (2021 half year: £nil; 2021 full year £16.0m credit) relating to the recognition of US deferred tax assets and a credit of £1.4m (2021 half year: £nil; 2021 full year £0.2m credit) relating to the amortisation of intangible assets.

The net income tax debit reflected in the Condensed Group Statement of Comprehensive Income amounted to £7.9m (2021 half year: £9.6m debit; 2021 full year: £13.0m credit), comprising the following:

- a debit of £7.9m (2021: half year £9.6m credit, inclusive of the restatement of UK deferred tax from 19% to 25%; full year £12.5m credit, inclusive of the buy-in of the UK pension scheme and the restatement of UK deferred tax from 19% to 25%) in respect of tax on net actuarial gains and losses on the employee benefits; and
- a debit of £nil in respect of exchange adjustments (2021: half year £nil; full year £0.5m credit).

Certain corporate tax liabilities were classified as non-current income tax payable (£7.7m) in the 30 June 2021 reported balance sheet within the 2021 Half Year Results. These have been reclassified to current income tax payable within the 30 June 2021 comparative balance sheet. There is no change to the net assets as at 30 June 2021, Condensed Group Income Statement for the 6 month period ended 30 June 2021 and non-current and current income tax payable balance as at 31 December 2021 as a result of this reclassification. A related interest liability of £3.6m as at 30 June 2021, included within other payables has been reclassified to Trade and other payables, within current liabilities.

5 Earnings per share ("EPS")

5.1 Earnings for EPS

Basic and diluted EPS from continuing operations are based upon the profit attributable to owners of the parent, as reported in the Condensed Group Income Statement. The table below reconciles these different profit measures.

	Unaudited Half year 2022 £m	Unaudited Half year 2021 £m	Full year 2021 £m
Profit attributable to owners of the parent	**81.0**	43.0	102.1
Adjustments for separately reported items:			
Amortisation of acquired intangible assets	**5.1**	4.8	9.7
Income tax (credit)/charge	**(1.4)**	0.7	(16.2)
Headline profit attributable to owners of the parent	**84.7**	48.5	95.6

5.2 Weighted average number of shares

	Unaudited Half year 2022 millions	Unaudited Half year 2021 millions	Full year 2021 millions
For calculating basic and headline EPS	**270.1**	270.4	270.5
Adjustment for potentially dilutive ordinary shares	**1.4**	1.5	1.8
For calculating diluted and diluted headline EPS	**271.5**	271.9	272.3

For the purposes of calculating diluted and diluted headline EPS, the weighted average number of ordinary shares is adjusted to include the weighted average number of ordinary shares that would be issued were all outstanding share options to vest in full, relating to the Company's share-based payment plans. Potential ordinary shares are only treated as dilutive when their conversion to ordinary shares would decrease EPS or increase loss per share.

5.3 Per share amounts

	Unaudited Half year 2022 Pence	Unaudited Half year 2021 pence	Full year 2021 pence
Earnings per share - basic	**30.0**	15.9	37.7
- diluted	**29.8**	15.8	37.5
- headline	**31.4**	17.9	35.3
- diluted headline	**31.2**	17.8	35.1

6 Dividends

	Unaudited Half year 2022 £m	Unaudited Half year 2021 £m	Full year 2021 £m
Amounts recognised as dividends and paid to equity shareholders during the period			
Final dividend for the year-ended 31 December 2020 of 14.3p per ordinary share	**-**	38.7	38.7
Interim dividend for the year-ended 31 December 2021 of 6.2p per ordinary share	**-**	-	16.8
Final dividend for the year-ended 31 December 2021 of 15.0p per ordinary share	**40.5**	-	-
	40.5	38.7	55.5

The Directors have declared an interim dividend of 6.5p in respect of the year-ending 31 December 2022.

7 Reconciliation of movement in net debt

	Balance as at 1 Jan 2022 £m	**Foreign exchange adjustments £m**	**Fair value gains/ (losses)**	**Non-cash movements* £m**	**Cash flow £m**	**Balance as at 30 June 2022 £m**
Cash and cash equivalents						
Cash at bank and in hand	**169.1**	**9.4**	**-**	**-**	**(1.3)**	**177.2**
Short term deposits	**-**	**-**	**-**	**-**	**-**	**-**
Bank overdrafts	**(6.7)**	**(0.2)**	**-**	**-**	**1.9**	**(5.0)**
	162.4	**9.2**	**-**	**-**	**0.6**	**172.2**
Borrowings, excluding bank overdrafts	**(440.3)**	**(19.0)**	**-**	**(5.5)**	**(41.0)**	**(505.8)**
Capitalised arrangement costs	**3.3**	**-**	**-**	**(0.5)**	**-**	**2.8**
Derivative financial instruments	**(2.5)**	**-**	**5.6**	**-**	**-**	**3.1**
Net debt	**(277.1)**	**(9.8)**	**5.6**	**(6.0)**	**(40.4)**	**(327.7)**

* £5.5m (2021 half year: £6.4m) of new leases were entered into during the year.

Net debt is a measure of the Group’s net indebtedness to banks and other external financial institutions and comprises the total of cash and short-term deposits, current and non-current interest-bearing borrowings and derivative financial instruments.

£50.1m proceeds from borrowings, shown in the Statement of cash flows, includes £29.0m and £21.1m (€25.0m) of Sterling and Euro drawings under the Group’s £385msyndicated bank facility.

£9.1m repayment of borrowings, shown in the statement of cash flows, includes £3.0m repayments of Sterling drawings under the collateralised bi-lateral loan facility and £6.1m of lease repayments.

Cash is held both centrally and in operating territories. There is no restricted cash. For certain territories including China, India and Russia cash is more readily used locally than for broader group purposes.

8 Cash Generated from Operations

	Unaudited Half year 2022 £m	Unaudited Half year 2021 £m
Operating profit	**122.3**	68.5
Adjustments for:		
Amortisation of acquired intangible assets	**5.1**	4.8
Trading Profit	**127.4**	73.3
(Gain)/loss on disposal of non-current assets	**(0.1)**	0.2
Depreciation	**26.2**	24.5
Defined benefit retirement plans net charge	**3.0**	3.3
Net increase in inventories	**(40.2)**	(53.3)
Net increase in trade receivables	**(62.9)**	(43.1)
Net increase in trade payables	**9.8**	45.3
Net decrease in other working capital	**10.0**	8.7
Outflow related to restructuring charges	**(0.5)**	(3.0)
Defined benefit retirement plans cash outflows	**(2.8)**	(4.0)
Vacant site remediation costs paid	**(0.9)**	(1.7)
Cash generated from operations	**69.0**	50.2

	Full year 2021 £m
Operating profit	132.7
Adjustments for:	
Amortisation of acquired intangible assets	9.7
Trading Profit	142.4
Loss on disposal of non-current assets	0.4
Depreciation	49.8
Defined benefit retirement plans net charge	6.4
Net decrease in inventories	(113.5)
Net decrease in trade receivables	(53.5)
Net increase in trade payables	70.6
Net decrease in other working capital	(5.5)
Outflow related to restructuring charges	(4.0)
Defined benefit retirement plans cash outflows	(7.2)
Vacant site remediation costs paid	(3.0)
Cash generated from operations	82.9

9 Employee benefits

The net employee benefits liability as at 30 June 2022 was £54.0m (2021 half year: £10.9m asset; 2021 full year: £77.0m liability) derived from an actuarial valuation of the Group's defined benefit pension and other post-retirement obligations as at that date.

The improvement in the balance sheet position has been driven primarily by an increase in bond yields resulting in a reduction in the value of German, Belgian and US liabilities. The German discount rate increased from 1.2% as at 31 December 2021 to 3.3% at 30 June 2022. In the funded UK plan, an insurance asset from PIC matches the remaining pension liabilities of the UK Plan, with the result that the Company no longer bears any investment, longevity, interest rate or inflation risks in respect of this UK Plan.

As disclosed in note 26 of the 2021 Annual Report and Financial Statements, the above amounts may materially change in the next 12 months if there is a change in assumptions.

	Unaudited Half year 2022 £m	Unaudited Half year 2021 £m	Full year 2021 £m
Employee benefits — net surpluses			
UK defined benefit pension plans	**23.3**	112.6	23.7
ROW defined benefit pension plans	**1.2**	0.6	1.4
Net surpluses	**24.5**	113.2	25.1
Employee benefits — net liabilities			
UK defined benefit pension plans	**(1.6)**	(1.7)	(1.6)
US defined benefit pension plans	**(21.8)**	(20.6)	(21.9)
Germany defined benefit pension plans	**(34.7)**	(53.4)	(53.3)
ROW defined benefit pension plans	**(13.1)**	(19.9)	(18.3)
Other post-retirement benefit plans	**(7.3)**	(6.7)	(7.0)
Net liabilities	**(78.5)**	(102.3)	(102.1)
Net assets/(liabilities)	**(54.0)**	10.9	(77.0)

The expense recognised in the Condensed Group Income Statement in respect of the Group's defined benefit retirement plans and other post-retirement benefit plans is shown below.

		Unaudited Half year 2022 £m	Unaudited Half year 2021 £m	Full year 2021 £m
In arriving at trading profit (as defined in Note 15.4)	— within other manufacturing costs	**0.8**	0.9	1.8
	— within administration, selling and distribution costs	**2.2**	2.4	4.6
In arriving at profit before tax	— within net finance costs	**0.7**	(0.1)	(0.3)
Total net charge		**3.7**	3.2	6.1

10 Contingent liabilities

Vesuvius has extensive international operations and is subject to various legal and regulatory regimes, including those covering taxation and environmental matters.

Certain of Vesuvius' subsidiaries are subject to legacy matter lawsuits, predominantly in the US, relating to a small number of products containing asbestos manufactured prior to the acquisition of those subsidiaries by Vesuvius. These suits usually also name many other product manufacturers. To date, Vesuvius is not aware of there being any liability verdicts against any of these subsidiaries. Each year a number of these lawsuits are withdrawn, dismissed or settled.

As the settlement of many of the obligations for which reserve is made is subject to legal or other regulatory process, the timing and amount of the associated outflows is subject to some uncertainty (see Note 30 of the 2021 Annual Report and Financial Statements for further information). The amount paid, including costs in relation to this litigation, has not had a material effect on Vesuvius' financial position or results of operations in the current period.

11 Related parties

The nature of related party transactions in H1 2022 are in line with those transactions disclosed in Note 34 of the 2021 Annual Report and Financial Statements. All transactions with related parties are conducted on an arm's length basis and in accordance with normal business terms. Transactions with joint ventures and associates are consistent with those disclosed in Note 34 of the 2021 Annual Report and Financial Statements. Transactions between related parties that are Group subsidiaries are eliminated on consolidation.

Transactions with joint ventures and associates	**Unaudited Half year 2022 £m**	Unaudited Half year 2021 £m
Sales to joint ventures	**2.6**	2.0
Purchases from joint ventures	**19.4**	14.2
Dividends received from joint ventures	**-**	1.0
Trade payables owed to joint ventures	**11.4**	7.4
Trade receivables owed by joint ventures	**0.6**	0.9

12 Acquisitions and divestments

There were no acquisitions or divestments in the period.

On 6 December 2021, Vesuvius plc acquired the trade and assets of Universal Refractories Inc. (URI), a specialty refractory producer based in Pennsylvania, USA, which is focused on tundish (steel continuous casting) applications as well as consumable products for the foundry industry. It has become part of the Group's Steel Advanced Refractories business unit, with the exception of the ladle liners business which has been absorbed by our Foundry Division (<10% of sales). The transaction valued URI at an enterprise value of $57.1m (£42.6m) on a cash and debt-free basis and was funded from Vesuvius' internal resources.

The fair values of the assets and liabilities recognised as a result of the acquisition have been updated during the six months ended 30 June 2022.There was a decrease of £1.1m to net identifiable assets acquired, largely due to a reduction in non-compete intangible assets of £0.9m. There was also a decrease of £0.5m to consideration.

	Book value	**Fair value adjustments**	**Adjusted value**
	£m	**£m**	**£m**
Property, plant and equipment	4.5	6.9	11.4
Intangible asset (customer relationships and know-how)	-	11.3	11.3
Inventories	5.0	1.3	6.3
Receivables	5.5	-	5.5
Payables	(1.9)	(0.6)	(2.5)
Borrowings	(5.4)	-	(5.4)
Deferred tax	-	(2.8)	(2.8)
Net identifiable assets acquired	7.7	16.1	23.8
Goodwill			13.9
Consideration			**37.7**

The goodwill is attributable to URI's reputation in the marketplace and the synergies that Vesuvius expects to gain from its integration. It is expected to be tax deductible.

Included within the property, plant and equipment acquired were right of use leased assets of £0.2m.

The decision to acquire URI was driven by its long-standing customer relationships and know-how. The identifiable intangible assets acquired are customer relationships and know-how. The fair value of these intangibles continues to be provisional pending final valuations. A deferred tax liability of £2.8m has been provided in relation to these fair value adjustments.

On acquisition, URI was subsumed into the Steel Advanced Refractories business unit and the Foundry Division and goodwill is monitored at the level of the Steel Advanced Refractories operating segment.

The net cash outflow on acquisition was £43.1m, including related excess working capital payment, the business was acquired on a cash and debt-free basis. In accordance with IFRS3, we disclose above consideration of £37.7m and borrowings repaid immediately prior to acquisition of £5.4m.

The Group did not acquire any material interests in any companies during the period ended 30 June 2022.

There was no contingent consideration paid during the period ended 30 June 2022. Contingent consideration of £0.1m was paid during 2021 in respect of the previous acquisition of Ecil Met Tec.

13 Provisions

	Disposal, closure and environmental costs £m	Restructuring charges £m	Other £m	Total £m
As at 1 January 2021	**42.2**	**9.2**	**5.4**	**56.8**
Exchange adjustments	(0.6)	(0.2)	(0.1)	**(0.9)**
Charge to Condensed Group Income Statement	0.7	-	5.0	**5.7**
Adjustment to discount	0.4	-	-	**0.4**
Cash spend	(4.0)	(3.0)	(5.4)	**(12.4)**
As at 30 June 2021	**38.7**	**6.0**	**4.9**	**49.6**

	Disposal, closure and environmental costs £m	Restructuring charges £m	Other £m	Total £m
As at 1 January 2022	**41.8**	**5.0**	**3.9**	**50.7**
Exchange adjustments	4.4	(0.4)	0.4	**4.4**
Charge to Condensed Group Income Statement	2.0	-	5.7	**7.7**
Adjustment to discount	0.5	-	-	**0.5**
Cash spend	(3.7)	(0.5)	(5.8)	**(10.0)**
As at 30 June 2022	**45.0**	**4.1**	**4.2**	**53.3**

Of the total provision balance at 30 June 2022 of £53.3m (30 June 2021: £49.6m), £36.0m (30 June 2021: £32.4m) is recognised in the Group Balance Sheet within non-current liabilities and £17.3m (30 June 2021: £17.2m) within current liabilities.

In assessing the probable costs and realisation certainty of provisions, or related assets, reasonable assumptions are made. Changes to the assumptions used could significantly alter the Directors' assessment of the value, timing or certainty of the costs or related amounts. The nature of the provisions held remains consistent with those held at 31 December 2021 and further description is set out within Note 30 of the 2021 Annual Report and Financial Statements.

14 Financial instruments

The Company's financial assets are measured at amortised cost with the exception of certain investments in debt, which are measured at fair value through other comprehensive income, and certain derivative instruments, which are measured at fair value through profit or loss. Financial liabilities are measured at amortised cost with the exception of certain derivative instruments, which are measured at fair value through profit and loss. The carrying value of financial assets and liabilities carried at amortised cost approximates the fair value.

IFRS 13 Fair Value Measurement requires classification of financial instruments within a hierarchy that prioritises the inputs to fair value measurement. The three levels of the fair value hierarchy are:

Level 1 – Unadjusted quoted prices in active markets for identical assets or liabilities;
Level 2 – Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly;
Level 3 – Inputs that are not based on observable market data.

14 Financial instruments (continued)

The following table summarises Vesuvius' financial instruments measured at fair value, and shows the level within the fair value hierarchy in which the financial instruments have been classified:

	Unaudited Half year 2022		Unaudited Half year 2021		Full year 2021	
	Assets	**Liabilities**	Assets	Liabilities	Assets	Liabilities
	£m	**£m**	£m	£m	£m	£m
Investments (Level 2)	**0.8**	**-**	0.9	-	0.5	-
Derivatives not designated for hedge accounting purposes (Level 2)	**0.2**	**(0.2)**	-	(0.1)	0.1	(0.3)
Derivatives designated for hedge accounting purposes (Level 2)	**3.1**	**-**	-	(5.0)	-	(2.3)

All of the derivative financial instruments not designated for hedge accounting purposes reported in the table above will mature within a year of the balance sheet date. There were no transfers between fair value hierarchies during the period. The method for determining the hierarchy and for valuing the financial instruments is consistent with that used at year-end, as disclosed in Note 25 of the 2021 Annual Report and Financial Statements. Fair value disclosures have not been made in respect of other financial assets and liabilities on the basis that the carrying amount is deemed to be a reasonable approximation of fair value.

The Group's Treasury department, acting in accordance with policies approved by the Board, is principally responsible for managing the financial risks faced by the Group. The Group's activities expose it to a variety of financial risks, the most significant of which are market risk and liquidity risk. The condensed interim financial statements do not include all financial risk management information and disclosures required in the annual financial statements; they should be read in conjunction with the Group's 2021 Annual Report and Financial Statements, in which further details of these financial risks were disclosed in Note 25. There have been no changes in the risk management policies since year end.

In June 2020 the Group executed a $86m Cross currency interest rate swap ('CCIRS') with 3 of its relationship banks. The effect of this is to convert the $86m Private Placement Notes issued in June 2020 into €76.6m. The timing and amount of the US Dollar cashflows under the CCIRS exactly mirror those of the Private Placement Notes and the maturity date of the CCIRS also matches the repayment date of the Notes. The CCIRS would by default be revalued through the Income Statement; however as it is in a designated hedging relationship it is instead revalued through Other Comprehensive Income. More specifically, the US Dollar exposure is designated as a cashflow hedge of the underlying Private Placement Notes and the Euro exposure is designated as a net investment hedge of part of the Group's foreign operations. The CCIRS is presented as a non-current asset or liability as it is expected to be settled more than 12 months after the end of the reporting period

With the exception of the CCIRS the fair value of Derivatives outstanding at 30 June 2022 has been booked through the Income Statement. All of the fair values shown in the table above are classified under IFRS 13 as Level 2 measurements which have been calculated using quoted prices from active markets, where similar contracts are traded and the quotes reflect actual transactions in similar instruments. All of the derivative assets and liabilities not designated for hedge accounting purposes reported in the table above will mature within a year of the balance sheet date.

The cross-currency interest rate swaps are fair valued at each reporting date and the Group applies hedge accounting in accordance with IFRS 9 such that the movement in fair value is accounted for directly within equity. The USD component is designated as a cashflow hedge of the $86m US Private Placement Notes. The Euro component is designated as a net investment hedge of the Group's Euro denominated net assets.

As at 30 June 2022, €249m and $60m of borrowings were designated as hedges of net investments in €249m and $60m worth of overseas foreign operations. In addition, the €76.6m CCIRS liability has been designated as a net investment hedge of a further €76.6m worth of overseas foreign operations.

14 Financial instruments (continued)

As the value of the borrowings and the CCIRS liability exactly matches the designated hedged portion of the net investments, the relevant hedge ratio is 1:1. The net investment hedges are therefore 100% effective with no ineffectiveness. It is noted that hedge ineffectiveness would arise in the event there were insufficient euro-denominated overseas foreign operations to be matched against the €76.6m CCIRS liability.

As at 30 June 2022, the Group had $146m, €198m and £28m (£318.4m in total) of US Private Placement Loan Notes (USPP) outstanding, which carry a fixed rate of interest, representing 68% of the Group's total borrowings outstanding at that date. Maturities of the corresponding USPP Notes were disclosed in Note 25 to the 2021 Annual Report and Financial Statements.

On 5 July 2021, the Group entered a new syndicated bank facility for £385.0m. On the same date the previous syndicated bank facility for £300.0m was cancelled. The new facility expires in July 2025.

The currency and interest rate profile of the Group's borrowings is detailed in the tables below.

	Financial liabilities (gross borrowings)		
	Fixed rate	**Floating rate**	**Total**
	£m	**£m**	**£m**
Sterling	**28.0**	**102.0**	**130.0**
United States dollar	**119.9**	**0.2**	**120.1**
Euro	**170.5**	**48.2**	**218.7**
Other	**-**	**0.6**	**0.6**
Capitalised costs	**(1.0)**	**(1.7)**	**(2.7)**
As at 30 June 2022	**315.7**	**151.0**	**466.7**
Sterling	28.0	76.4	104.4
United States dollar	107.9	1.2	109.1
Euro	166.4	27.2	193.6
Other	-	-	-
Capitalised costs	(1.2)	(2.1)	(3.3)
As at 31 December 2021	301.1	102.7	403.8

The maturity analysis of the Group's financial liabilities is shown in the tables below. The cash flows shown are undiscounted.

As at 30 June 2022	**Within one year**	**Between 1-2 years**	**Between 2-5 years**	**Over 5 years**	**Total contractual cash flows**	**Carrying amount**
	£m	**£m**	**£m**	**£m**	**£m**	**£m**
Trade payables	**278.9**	**-**	**-**	**-**	**278.9**	**278.9**
Loans & overdrafts	**33.4**	**34.3**	**276.7**	**176.2**	**520.6**	**469.4**
Lease liabilities	**11.3**	**9.6**	**14.8**	**15.3**	**51.0**	**41.2**
Capitalised arrangement fees	**-**	**-**	**-**	**-**	**-**	**(2.7)**
Derivative liability	**0.2**	**-**	**-**	**-**	**0.2**	**0.2**
Total financial liabilities	**323.8**	**43.9**	**291.5**	**191.5**	**850.7**	**787.0**

14 Financial instruments (continued)

As at 31 December 2021	Within one year	Between 1-2 years	Between 2-5 years	Over 5 years	Total contractual cash flows	Carrying amount
	£m	£m	£m	£m	£m	£m
Trade payables	253.8	-	-	-	253.8	253.8
Loans & overdrafts	37.4	9.6	178.2	235.0	460.2	407.1
Lease liabilities	11.6	9.2	13.4	13.2	47.4	39.9
Capitalised arrangement fees	-	-	-	-	-	(3.3)
Derivative liability	(0.6)	(0.6)	(0.6)	0.2	(1.6)	2.6
Total financial liabilities	302.2	18.2	191.0	248.4	759.8	700.1

As noted above, the syndicated bank facility was replaced in July 2021 and the replacement facility references SONIA for GBP drawdowns. The maturity of the £19.0m bi-lateral bank facility was extended from October 2021 to October 2022; at the time of the extension the reference to GBP LIBOR was replaced with a reference to SONIA.

In H1 2022, the Group did not hold any borrowings for which the interest payable referenced LIBOR benchmarks, nor does it intend to do so in the foreseeable future. The Group's £385m syndicated bank facility allows for USD denominated borrowings and any such borrowings would currently reference USD LIBOR. It is further noted that the terms of the facility require an alternative reference rate for USD borrowings to be agreed by June 2023.

15 Alternative performance measures (unreviewed)

The Company uses a number of Alternative Performance Measures (APMs) in addition to those reported in accordance with IFRS. The Directors believe that these APMs, listed below, are important when assessing the underlying financial and operating performance of the Group and its Divisions, providing management with key insights and metrics in support of the ongoing management of the Group's performance and cash flow. A number of these align with KPI's and other key metrics used in the business and therefore are considered useful to also disclose to the users of the financial statements. The following APMs do not have standardised meaning prescribed by IFRS and therefore may not be directly comparable to similar measures presented by other companies.

15.1 Headline performance

Headline performance, reported separately on the face of the Condensed Group Income Statement, is from continuing operations and before items reported separately on the face of the Condensed Group Income Statement.

15.2 Underlying revenue, underlying trading profit and underlying return on sales

Underlying revenue, underlying trading profit and underlying return on sales are the headline equivalents of these measures after adjustments to exclude the effects of changes in exchange rates, business acquisitions and disposals. Reconciliations of underlying revenue and underlying trading profit can be found in the Financial Summary. Underlying revenue growth is one of the Group's key performance indicators and provides an important measure of organic growth of Group businesses between reporting periods, by eliminating the impact of exchange rates, acquisitions and disposals.

15.3 Return on Sales ('ROS')

ROS is calculated as trading profit divided by revenue. It is one of the Group's key performance indicators and is used to assess the trading performance of Group businesses. ROS is included in Note 2.

15.4 Trading profit/adjusted EBITA

Trading profit/adjusted EBITA is defined as operating profit before separately reported items. It is one of the Group's key performance indicators and is used to assess the trading performance of Group businesses. It is also used as one of the targets against which the annual bonuses of certain employees are measured.

15.5 Headline profit before tax

Headline profit before tax is calculated as the net total of trading profit, plus the Group's share of post-tax profit of joint ventures and total net finance costs associated with headline performance. It is one of the Group's key performance indicators and is used to assess the financial performance of the Group as a whole.

15.6 Headline effective tax rate ('ETR')

The Group's headline ETR is calculated on the income tax costs associated with headline performance, divided by headline profit before tax and before the Group's share of post-tax profit of joint ventures and associates.

15.7 Headline earnings

Headline earnings is profit after tax before separately reported items attributable to owners of the parent.

15.8 Headline earnings per share

Headline earnings per share is calculated by dividing headline profit before tax less associated income tax costs, attributable to owners of the parent by the weighted average number of ordinary shares in issue during the year. It is one of the Group's key performance indicators and is used to assess the underlying earnings performance of the Group as a whole. It is also used as one of the targets against which the annual bonuses of certain employees are measured. Headline earnings per share is disclosed in Note 5.

15 Alternative performance measures (unreviewed) (continued)

15.9 Adjusted operating cash flow

Adjusted operating cash flow is cash generated from operations before restructuring and vacant site remediation costs but after deducting capital expenditure net of asset disposals. It is used in calculating the Group's cash conversion.

	Unaudited Half year 2022 £m	Unaudited Half year 2021 £m	Full year 2021 £m
Cash generated from continuing operations	**69.0**	50.2	82.9
Add: Outflows relating to restructuring charges	**0.5**	3.0	4.0
Add: Vacant site remediation costs paid	**0.9**	1.7	3.0
Less: Capital expenditure	**(38.6)**	(17.6)	(45.5)
Add: Proceeds from the sale of property, plant and equipment	**1.3**	0.6	1.2
Adjusted operating cash flow	**33.1**	37.9	45.6
Trading Profit	**127.4**	73.3	142.4
Cash Conversion	**26%**	52%	32%

15.10 Cash conversion

Cash conversion is calculated as adjusted operating cash flow divided by trading profit. It is useful for measuring the rate at which cash is generated from trading profit. It is also used as one of the targets against which the annual bonuses of certain employees are measured.

15.11 Free cash flow

Free cash flow is defined as net cash flow from operating activities after net outlays for the purchase and sale of property, plant and equipment, dividends from joint ventures and dividends paid to non-controlling shareholders. It is one of the Group's key performance indicators and is used to assess the underlying cash generation of the Group and is one of the measures used in monitoring the Group's capital. A reconciliation of free cash flow is included underneath the Condensed Group Statement of Cash Flows.

15.12 Average trade working capital to sales ratio

The average trade working capital to sales ratio is calculated as the percentage of average trade working capital balances to the total revenue for the previous 12 months, at constant currency. Average trade working capital (comprising inventories, trade receivables and trade payables) is calculated as the average of the 13 previous month-end balances. It is one of the Group's key performance indicators and is useful for measuring the level of working capital used in the business and is one of the measures used in monitoring the Group's capital.

	Unaudited Half year 2022 £m	Unaudited Half year 2021 £m	Full year 2021 £m
Average trade working capital	**426.4**	319.4	350.6
Last 12 months total revenue	**1,868.6**	1,542.3	1,674.6
Average trade working capital to sales ratio	**22.8%**	20.7%	20.9%

15 Alternative performance measures (unreviewed) (continued)

15.13 Adjusted earnings before interest, tax, depreciation and amortisation (adjusted EBITDA)

Adjusted EBITDA is calculated as the total of trading profit before depreciation and amortisation of non-acquired intangible assets. It is used in the calculation of the Group's interest cover and net debt to adjusted EBITDA ratios. A reconciliation of adjusted EBITDA is included in Note 2.

15.14 Net interest payable on borrowings

Net interest payable on borrowings is calculated as total interest payable on borrowings less finance income, excluding interest on net retirement benefit obligations, adjustments to discounts and any item separately reported. It is used in the calculation of the Group's interest cover ratio.

	Unaudited Half year 2022 £m	Unaudited Half year 2021 £m	Full year 2021 £m
Total interest payable on borrowings (note 3)	**8.0**	5.8	13.0
Finance income (note 3)	**(2.3)**	(2.3)	(6.7)
Net interest payable on borrowings	**5.7**	3.5	6.3

15.15 Interest cover

Interest cover is the ratio of adjusted EBITDA for the last 12 months to net interest payable on borrowings for the last 12 months. It is one of the Group's key performance indicators and is used to assess the financial position of the Group and its ability to fund future growth. This measure is also a component of the Group's covenant calculations.

	Unaudited Half year 2022 £m	Unaudited Half year 2021 £m	Full year 2021 £m
Last 12 months adjusted EBITDA	**248.0**	173.3	192.2
Last 12 months net interest payable on borrowings	**8.5**	8.1	6.3
Interest cover	**29.2x**	21.4x	30.5x

15.16 Net debt

Net debt comprises the net total of current and non-current interest-bearing borrowings (including IFRS16 lease liabilities), cash and short-term deposits and derivative financial instruments. Net debt is a measure of the Group's net indebtedness to banks and other external financial institutions. A reconciliation of the movement in net debt is included in Note 7.

15.17 Net debt to adjusted EBITDA

Net debt to adjusted EBITDA is the ratio of net debt at the period-end to adjusted EBITDA for the last 12 months. It is one of the Group's key performance indicators and is used to assess the financial position of the Group and its ability to fund future growth and is one of the measures used in monitoring the Group's capital.

	Unaudited Half year 2022 £m	Unaudited Half year 2021 £m	Full year 2021 £m
Net debt (note 7)	**327.7**	196.6	277.1
Last 12 months adjusted EBITDA (note 2)	**248.0**	173.3	192.2
Net debt to adjusted EBITDA	**1.3x**	1.1x	1.4x

15 Alternative performance measures (unreviewed) (continued)

15.18 Return on invested capital (ROIC)

From 2022 onwards, the Group has adopted ROIC as its key measure of return from the Group's invested capital. RONA performance measure has been replaced with ROIC which provides a more complete measure of Vesuvius's returns. ROIC is calculated as trading profit less amortisation of acquired intangibles plus share of post-tax profit of joint ventures and associates for the previous 12 months after tax, divided by the average invested capital (total assets excluding cash plus non-interest bearing liabilities), at constant currency (being the average over balance sheet date and the 12 month's prior balance sheet date invested capital).

	Unaudited Half year 2022	Unaudited Half year 2021 £m	Full year 2021 £m
Average invested capital	**1,437.9**	1,349.5	1,371.6
Trading profit (note 15.4)	198.7	122.4	145.0
Amortisation of acquired intangible assets	(9.9)	(9.8)	(9.7)
Share of post-tax profit from joint ventures and associates	1.7	1.2	1.4
Tax on trading profit and amortisation of acquired intangible assets	(51.9)	(29.9)	(35.8)
	138.6	83.9	100.9
ROIC	**9.6%**	6.2%	7.4%

15.19 Constant currency

Figures presented at constant currency represent 2021 amounts retranslated at average 2022 exchange rates.

15.20 Liquidity

Liquidity is the Group's cash and short-term deposits plus undrawn committed debt facilities less cash used as collateral on loans and any gross up of cash in notional cash pools.

	Unaudited Half year 2022 £m	Unaudited Half year 2021 £m	Full year 2021 £m
Cash and short term deposits	**177.2**	162.1	169.1
Undrawn committed debt facilities	**257.1**	348.7	308.1
Cash used as collateral on loans	**(18.0)**	(19.0)	(21.0)
Gross up of cash in notional pools	**(0.1)**	(3.3)	(0.5)
Liquidity	**416.2**	**488.5**	**455.7**

15.21 Last twelve months ('LTM')

Some results are presented or calculated using data from the last twelve months from the reference date.

16 Exchange rates (unreviewed)

The Group reports its results in pounds sterling. A substantial portion of the Group's revenue and profits are denominated in currencies other than pounds sterling. It is the Group's policy to translate the income statements and cash flow statements of its overseas operations into pounds sterling using average exchange rates for the year reported (except when the use of average rates does not approximate the exchange rate at the date of the transaction, in which case the transaction rate is used) and to translate balance sheets using period end rates. The principal exchange rates used were as follows:

	Income and expense Average rates				
	Half year 2022	Half year 2021	Full year 2021	Half year to Half year change	Full year to Half year change
US Dollar	1.30	1.39	1.38	-6.5%	-5.8%
Euro	1.19	1.15	1.16	3.5%	2.6%
Chinese Renminbi	8.42	8.98	8.87	-6.2%	-5.1%
Japanese Yen	159.48	149.63	151.06	6.6%	5.6%
Brazilian Real	6.59	7.48	7.42	-11.9%	-11.2%
Indian Rupee	98.87	101.82	101.67	-2.9%	-2.8%
South African Rand	19.97	20.17	20.32	-1.0%	-1.7%

	Assets and liabilities Period end rates				
	Half year 2022	Half year 2021	Full year 2021	Half year to Half year change	Full year to Half year change
US Dollar	1.22	1.38	1.35	-11.6%	-9.6%
Euro	1.16	1.17	1.19	-0.9%	-2.5%
Chinese Renminbi	8.15	8.94	8.61	-8.8%	-5.3%
Japanese Yen	165.25	153.62	155.69	7.6%	6.1%
Brazilian Real	6.4	6.87	7.54	-6.8%	-15.1%
Indian Rupee	96.12	102.82	100.75	-6.5%	-4.6%
South African Rand	19.81	19.73	21.64	0.4%	-8.5%