Leading the digital inkjet revolution

Xaar plc

Annual Report and Financial Statements 2018

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Xaar's purpose: We unlock innovation, efficiency and creativity

We do this by using our exceptional talent and passion for inkjet technology to design and manufacture products for our customers that help them to: develop innovative solutions, drive supply chain efficiencies and deliver more creativity for their customers.

Printhead

Our Printhead business unit focuses on the design, manufacture, marketing and sale of printheads, and associated products which are used in a variety of sectors such as for printing Ceramic Tile Decoration, Graphics, Décor, Labels and Packaging as well as 3D Printing and Additive Manufacturing.

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Product Print Systems

Product print involves printing all kinds of industrial and promotional objects such as medical equipment, automotive parts, tools, apparel, appliances, sports equipment and toys. Xaar company, EPS, manufactures and sells a range of highly customised print systems for these applications, including some using Xaar's own inkjet printheads.

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3D Printing

Our 3D Printing business unit, in which Xaar 3D sits, develops 3D printing solutions based on High Speed Sintering technologies which will have unique capabilities to address new markets especially in manufacturing. With investment from Xaar plc and Stratasys, Xaar 3D can leverage the natural synergies between global leaders in inkjet technology and 3D printing technology.

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HIGHLIGHTS

Positioned for sustainable growth

Revenue £m

£63.5m

(2017: £100.1m)

2018	63.5
2017	100.1
2016	96.2

Adjusted (loss)/profit before tax² £m

(£11.7m)

(2017: £18.0m)

2018	(11.7)
2017	18.0
2016	19.5

Net cash¹ £m

£27.9m

(2017: £44.7m)

2018	27.9
2017	44.7
2016	49.3

(Loss)/profit before tax £m

(£14.9m)

(2017: £12.3m)

2018	(14.9)
2017	12.3
2016	17.9

1 Net cash includes cash, cash equivalents and treasury deposits.
2 Adjusted measures exclude items from the IFRS operating (loss)/profit margin and (loss)/profit before tax, such as restructuring and investment expenses, share-based payment charges, exchange differences on intra-group transactions, and research and development credit, per the reconciliation of adjusted financial measures on page 100.

Strategic and operational highlights

- Three Business Unit structure implemented
- Revenue streams more diversified; 79% derived from new products and businesses introduced in the last three years
- Strategic review of Printhead business highlights preferred way forward
- Xaar 5601 Thin Film printhead being integrated and evaluated by more than 20 OEMs across packaging, commercial, textiles and décor segments. Three OEMs have announced publicly (Windmöller & Hölscher, Neos and KELENN Technology)
- Formation of Xaar 3D Limited announced in July, the joint investment with Stratasys. First Beta High Speed Sintering printer placed in December 2018
- EPS signed a distribution agreement with Machines Dubuit to distribute exclusively its product portfolio in North America.

Financial highlights

- Revenue in 2018 was £63.5 million, £52.4 million excluding licence royalties. This represents a decline in revenue of 37% year on year, largely driven by a decline in our Ceramics business
- Gross margin of 38.5% (2017: 47.0%) was adversely impacted by the aggressive 58% decline in revenues from the Industrial segment, a reduction in revenues from licensees of £5.3 million and a one-off provision for slow moving inventory of £2.5 million
- Adjusted operating loss margin was (18.7%) (2017: profit margin of 17.8%). In addition to the gross margin decline, this incorporates the impact of higher net Research and Development (R&D) investment following cessation of the capitalisation of the P4 (Thin Film) platform in July 2017 and a provision on past due debtors of £4.5 million
- Net cash at 31 December 2018 was £27.9 million (31 December 2017: £44.7 million), reflecting continued investment in our Thin Film platform and High Speed Sintering 3D printer technology, and the working capital build due to slower new product sell through.

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CHAIRMAN'S REPORT

Looking at our world differently

Our strategic review has given us important insight and a clear way forward in our core Printhead business.

Robin Williams
Chairman

2018 has given us several advances, but overshadowed by some key performance gaps.

The year has been a difficult one for Xaar, with continued decline in our Ceramics related sales, a drop of over £20 million this year, and integration issues slowing down our Thin Film product, the Xaar 1201, which aims to re-establish Xaar in the Chinese Wide-Format Graphic market.

These factors have been the major causes of weak financial performance which masks the positive developments in a number of other areas of our business.

In our Thin Film technology, the Xaar 5601 printhead has advanced to the point of now being adopted by several OEMs for integration into their new printer platforms. Relationships with Windmöller & Hölscher, Neos and KELENN Technology have been announced and further OEMs are working with the Xaar 5601, which gives encouragement to the prospects of substantial revenues building over the next few years from this technology.

In our Bulk piezo printhead business, where the impact of declining Ceramic revenues is felt, we have taken a series of cost reduction actions to bring capacity down to the visible level of demand. Some advances were made in Packaging application markets and the potential for upside from the digitisation of markets such as printing direct to containers and laminate decoration remains, albeit on unpredictable timing.

Our 3D Printing business attracted a significant investment and shareholding from a global leader in additive manufacturing, Stratasys, based in the US and Israel. We look forward to further developments on distribution arrangements and manufacturing partners as we meet milestones for placing prototype printers with customers in 2019.

In Q1 2018 we received the second instalment of royalty buyout from Seiko Instruments Inc. (SII) which now leaves our licence income at a low level.

Plainly our trading performance and working capital build up has impacted our cash balances, but, at £27.9 million year end cash, we remain well funded, although unable to recommend dividend payments to shareholders while we make losses.

We announced a strategic review of our Printhead business in September 2018 and this has yielded several useful conclusions, covered in the Chief Executive Officer's report, among which was the strong achievements which Xaar has made in the past decade when set against far larger companies with greater resources.

Xaar has a portfolio of innovative and competitive products, with the Printhead range now supplemented by bespoke product printers through our EPS company in Vermont, US, also with the prospect of 3D printers in the market for the first time in 2019. Whilst we are disappointed with the slower than expected adoption of some of our new printhead products, we are confident that the transformation we are undergoing will lead us to become a more diversified and customer-centric organisation, with an appropriate balance between established and developing technologies. We remain focused on delivering the benefits of our strong portfolio and technology advantages to shareholders.

The need to reduce costs and to deliver innovative products to the market has once again placed a heavy set of demands on our staff, which have been met with continued skill and determination. I would like to thank our employees for their hard work and dedication throughout 2018.

Changes to the Board since 1 January 2018, are set out below:

- On 14 November 2018, Lily Liu, Chief Financial Officer and Company Secretary, left the Company to take up a position elsewhere. We were delighted to appoint Shomit Kenkare as her successor as Chief Financial Officer, who had previously joined Xaar as Head of Corporate Development
- As previously announced, Ted Wiggans, our Chief Operations Officer, retired from the Group on 9 August 2018.

Robin Williams
Chairman
21 March 2019

Our values

In order to help us achieve our mission and goals, we aim to live by a certain set of values every single day. These values are our guiding principles.

1. **Trust –** We trust each other to deliver on our commitment and do our best for Xaar
2. **Collaboration –** We all work together, and with our partners, to achieve success
3. **Drive –** We are excited about our potential and put energy into everything we do.

Our people

Xaar employs exceptional people from a diverse range of disciplines and backgrounds, many of whom are leaders in their specific area of expertise and are passionate about what they do.

All our people, from our Engineers and Operators to business support and Sales & Marketing professionals, play valuable roles in keeping Xaar at the forefront of digital inkjet technology and delivering leading products to our customers.

Scientifica Tiles, India adopts Xaar 2001+ printhead

Based in Morbi, India, Scientifica Tiles is a newly established, family-run business that manufactures high-quality glaze vitrified floor tiles for the Indian, South American, Middle East and Israeli markets.

Scientifica Tiles opted for a KERAjet Master printer with Xaar 2001+ GS12C printheads for its ability to accurately replicate natural marbles and stones, currently much in demand in the market. The manufacturer is benefiting from the printheads' powerful combination of 2,000 nozzles with 720 dpi resolution, which together deliver fine details, smooth gradients and strong colours. Scientifica Tiles is also utilising Xaar's High Laydown (HL) Technology for special effects.

"We are very excited about the creative opportunities offered by the Xaar 2001+ printheads, and the print quality we are getting is extremely high. Compared to other printheads that are available, a big advantage with the Xaar 2001+ is the fact it can reproduce the subtle colour gradients of marbles and stones, making it ideal for these designs," says Hiren Vadaviya, Director of Scientifica Tiles.

STRATEGIC REPORT

WHO WE ARE

Leading the digital inkjet revolution

Overview

We are a world leader in the development of digital inkjet technology. Our technology drives the conversion of analogue printing and manufacturing methods to digital inkjet which is more efficient, cheaper and more productive than the traditional methods it replaces.

Markets we serve

Industrial
The Industrial markets we serve include Ceramic Tile Decoration, Decorative Laminates, Functional Fluid Deposition, Advanced Manufacturing, 3D Printing, Glass Printing and Textiles.

Packaging
The Packaging sectors we serve include Coding & Marking, Primary Labels, and Direct-to-Shape printing as well as Product Printing.

Graphic arts
The Graphic Arts segments we serve include Grand- and Wide-Format Graphics.

We are structured around three business units

Printhead
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Product Print Systems
...read more on page 14

3D Printing
...read more on page 18

Where we operate

Americas

Revenue £m
£21.0m
(2017: £19.4m)

EMEA

Revenue £m
£22.7m
(2017: £29.8m)

Asia

Revenue £m
£19.8m
(2017: £50.9m)

Offices #
10

Average employees #
516

Xaar regional locations
Authorised resellers

Why we are different

29 years
We are the only truly independent inkjet technology company with 29 years of know how.

Inkjet expertise
We offer unrivalled inkjet expertise including technology and printhead design and development. We also manufacture highly customised product decoration systems and industrial 3D printing machines.

Unique technologies
Our unique technologies and products are the leading enabler for innovation and creativity, and for driving supply chain efficiencies for many industries.

Open systems
Our open systems approach delivers more choice to our customers and also encourages market conversion from analogue to digital processes.

Collaborative
Our independence enables a flexible, collaborative approach to ensure we focus on our customers' goals.

Over the last 20 years digital imaging technologies, including digital inkjet, have emerged for applying images, patterns or finishes in more efficient, flexible and cost effective ways. Because inkjet is suitable for a variety of inks, other fluids and many different substrates, and it copes in harsh environments, it has the potential to replace all current printing techniques.

In the main, Xaar focuses on inkjet technology which it develops and sells in the form of printheads. Our customers (Original Equipment Manufacturers – OEMs), who buy our printheads, use them as the print engine in the printers and print systems they manufacture. Their customers ("end users") buy their printers and print systems which they use to pattern, decorate, print or finish in some way, whatever goods they are producing.

We also design and manufacture systems for product decoration and 3D printing which use our inkjet technology.

What are the benefits of digital inkjet?

- **Cost effective production** with no limit on the run length and no minimum order
- **Mass customisation** and **variable data** printing is easy
- **Short print runs** for limited editions or **localised promotions**
- Printing onto **irregular shapes** is possible
- **Rapid order turnaround** once the design is agreed
- Simple workflow with **quick and easy job setup and changeover**
- **Avoids the complexities**, **cost** and **waste** associated with analogue printing
- Very **controlled fluid deposition.**

A world of opportunities

3D Printing

Ceramic Tile Decoration

Coding & Marking

Decorative Laminates

Direct-to-Shape

Functional Fluid Deposition

Glass Printing

Graphics

Primary Labels

Packaging

Product Printing

Textiles

OUR BUSINESS MODEL

Creating value for all stakeholders

As well as selling our technology in component form (the printhead) to OEMs who produce and sell the complete digital printing solution, we actively partner and co-develop with fluid suppliers, hardware and software integrators, and substrate suppliers. Therefore we deliver a robust and attractive total solution to the end user. In some markets we design and develop complete industrial printing machines which we sell to end users.

How we create value

Leading the digital inkjet revolution

1. Xaar designs

We have R&D facilities in Cambridge, Nottingham, Copenhagen, Stockholm, and Vermont. We also work with strategic partners to jointly develop some products.

24%
Xaar invested a substantial proportion of sales in R&D to remain a world leader in inkjet technology.

360
Patents and patent applications. We continually add to our Intellectual Property (IP) portfolio.

75
R&D staff representing 15% of the total workforce.

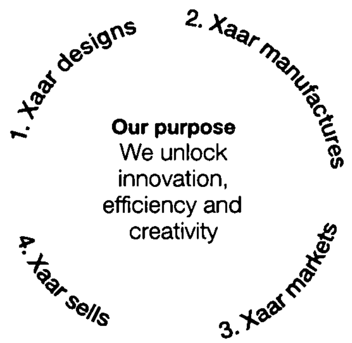
2. Xaar manufactures

Xaar manufactures its printheads in Huntingdon, UK. Xaar's manufacturing is capital intensive.

£70m
The Group has invested over £70 million in assets and production facilities in Huntingdon since the plant opened in 2007.

95%
We export over 95% of our printheads to customers around the world.

EPS
EPS, a Xaar company, manufactures customised and bespoke printing solutions in Vermont, USA.



4. Xaar sells

Xaar sells direct to OEMs around the world through its global sales team. In some more mature Ceramics markets we also sell to regional distributors. Xaar's highly skilled application engineers offer the highest level of technical support to assist OEMs in the successful design, build, commissioning, and ongoing maintenance of printing systems. Europe, Asia and North America are the primary locations of our current OEM partners.

Xaar also sells product printing equipment, services and consumables via EPS, and Xaar's 3D Printing business unit is responsible for selling Industrial 3D printers to OEMs and end users.

3. Xaar markets

Xaar offers a wide range of industrial inkjet printheads and print systems which are designed and produced to meet the customer-driven requirements of a range of manufacturing applications. Primary markets include:

- 3D Printing
- Ceramic Tile Decoration
- Coding & Marking
- Decorative Laminates
- Direct-to-Shape
- Functional Fluid Deposition
- Glass Printing
- Graphics
- Primary Labels
- Packaging
- Product Printing
- Textiles

Outputs

We create value for all our stakeholders

Customers (OEMs) and end users (our customers' customers)
With Xaar technology, our customers and their customers are able to innovate in their manufacturing methods and their products as well as benefit from a shorter distribution chain; they can implement more precise and efficient processes, easily produce short batches, take products to market more quickly, improve productivity, reduce waste and unlock creativity.

Shareholders
A key goal at Xaar is to maximise the long term growth in value delivered to shareholders via sustained, long term growth in earnings per share. This is delivered through continued investment in R&D and producing a pipeline of new products which deliver a sustained return on capital employed.

Our employees
Our success depends on the capability of our people. We want bright and driven people who share our values and passion for developing and manufacturing world leading technology. We aim to build long term relationships with all our employees by helping them grow and develop, and by making Xaar an exciting place to work as well as a great company to be involved with.

In order to further progress Xaar's transformation and to encourage our employees to transform their careers at Xaar, in 2018 we continued our XCEL programme. This is a comprehensive collection of new and existing employee development modules and opportunities such as GATE, our three year programme for individuals identified by Talent Management for accelerated learning. We also launched our new employee engagement forum where employees had the opportunity to meet and chat with all of our Non-Executive Directors.

Environment
Digital print methods are inherently more environmentally friendly than the analogue techniques we seek to replace. Research shows that, compared to analogue alternatives, digital has a huge impact in reducing energy consumption (by as much as 55%), water consumption (by up to 60%) and CO_2 emissions (by up to 95%), but also in reducing pollution and waste materials. Xaar is committed to reducing its impact on the environment wherever possible. Our actuator technology consumes less energy than competitor alternatives and our industrial printheads can remain in use for many years. In addition, we use a continuous improvement methodology and we have adopted a manufacturing ethos of "reduce, reuse and recycle". We are committed to adopting advanced manufacturing techniques in our own cleanrooms wherever possible. Some of these techniques reduce manufacturing waste and eliminate the need for tooling and parts.

Digital printing compared to analogue reduces consumption of:

CO_2 emissions
95%

Energy consumption
55%

Water consumption
60%

STRATEGIC REPORT

OUR BUSINESS UNITS

Printhead

Introduction to Printhead

% of Xaar's overall revenue

78%

(2017: 86%)

9 22 36 33

Graphic Arts: **9%**
Industrial: **36%**
Packaging: **33%**
Royalties: **22%**

Printhead revenue

£49.8m

(2017: £86.1m)

2018 49.8
2017 86.1

What we achieved in 2018

Whilst 2018 was a challenging year for the Printhead business unit, we made progress in a number of key areas:

We achieved moderate product growth with some of the recently introduced products – the Xaar 1003U, Xaar 2001C and U, Xaar 501 and Xaar 502 printheads. Applications contributing to this were Packaging, Coding & Marking, Décor, Glass Printing and Direct-to-Shape /Product Printing.

We also made progress with the Xaar 5601 with three OEMs – Windmöller & Hölscher, KELENN Technology and Neos – announcing publicly their choice of Xaar 5601 for their next generation digital presses and printers. Furthermore, this outstanding printhead is also in the hands of multiple OEMs across commercial, packaging and textile printing.

Our Xaar 2001 printhead made progress too, albeit slow, gaining some traction in the ceramics market, particularly in China.

Priorities for 2019

In 2019 we will continue to focus on driving growth in multiple sectors with our comprehensive range of printheads. One specific focus will be on the Xaar 5601, with our first textiles show in June (ITMA, 20-26 June). In addition we will be continuing to support the Xaar 1201 and Xaar 2001 across all our regions.

Where we excel

- State-of-the-art UK manufacturing facilities and an enviable R&D department staffed by scientists and engineers with a wealth of inkjet industry knowledge and expertise
- A comprehensive portfolio of printheads to cover a wide range of applications
- Engineers with extensive knowledge of inkjet and its application across many sectors as well as considerable field experience. This means they are able to assist our OEMs in the successful design, build, commissioning and post-installation support of all Xaar-based inkjet systems
- Ready-to-use development kits and an extensive portfolio of systems components ensures that OEMs can get up and running quickly
- Well-established partnerships with ink manufacturers which means our OEMs benefit from accelerated ink optimisation.

Xaar Printhead range

Product	Key benefits
Xaar 1003	Ultimate versatility in Ceramic Tile Decoration
Xaar 2001 / Xaar 2001+	High print quality with high productivity
Xaar 128	Adaptable printhead with trouble-free integration
Xaar 501	High production up-time and industrial reliability
Xaar 502 O	Industrial reliability and mineral-oil free inks
Xaar 502 S	Exceptional print quality for Wide-Format Graphics
Xaar 1201	High print quality, highly versatile and easy to integrate
Xaar 5501	High print quality, cost-effective and easy to integrate
Xaar 5601	Delivering market-leading combination of total cost of ownership, print quality and usability
Xaar 1003 AM	Highly accurate fluid deposition for manufacturing
Xaar Ink Supply Systems	Industrial fluid control solutions
Xaar Drive Electronics	Reduce Time-to-Market and rapid production ready solutions

Xaar's unique inkjet technologies

We have a number of unique technologies which are incorporated into our printheads, and which provide distinct advantages to our OEM partners and their end user customers. Our leading technologies include:

AcuDrp Technology
Xaar's innovative AcuDrp Technology, which is incorporated into the Xaar 5601, offers complete control over greyscale drop ejection for perfect image uniformity.

High Laydown Technology
Xaar's High Laydown Technology enables a range of new applications, thanks to its ability to deposit large quantities of fluid in each pass. It makes possible printing very high levels of UV inks or high build varnish in a single pass for tactile embellishments on labels, packaging and commercial print. Braille and label warning triangles are also possible. High Laydown Technology delivers unprecedented ink discharge rates for gloss and adhesive effects on ceramic tiles, so that effects can be printed at high line speeds. For additive manufacturing applications, High Laydown Technology offers increased printing productivity which significantly accelerates build rate for parts and the ability to print a broader range of fluids including higher viscosity materials; this ultimately results in tougher 3D printed parts than those printed with standard inkjet technology.

TF Technology
Xaar's TF Technology enables ink in the printhead to flow directly past the back of the nozzle during drop ejection. This means that nozzles are continuously primed. As a result, single-pass printers can be run for a full production shift with minimal maintenance, delivering a leap forward in inkjet printer reliability. TF Technology is incorporated into the Xaar 1003, Xaar 2001, Xaar 501, Xaar 502, Xaar 5601.

Our markets and opportunities

Industrial

The main sectors for Xaar within the Industrial market are:

Ceramic Tile Decoration

The majority of the tile decoration market uses digital inkjet technology because, compared to traditional analogue techniques, it is superior in terms of image quality and is lower in cost. In addition, it offers the advantages of flexibility, inventory reduction and larger tile size capability. This is a mature market for Xaar with strong competition. However, with an average useful life of five to six years, several hundred new ceramics printers will be required each year for the foreseeable future, making this a reasonable market for a few more years to come. The Xaar 2001+ with three variants, 720 dpi resolution and unique High Laydown Technology for textured tile effects, is the most versatile printhead family for ceramic tile decoration on the market.

Output m²

13.6bn m²

Global production lines #

10,000

Decorative Laminates

Realistic wood finishes or creative design are the key features which sell the board/plank/ finished item. The digital quality that is now being demonstrated with Xaar printheads matches quality produced by the analogue process, thereby offering the opportunity for more economic short run work to be undertaken whilst reducing inventories and improving time-to-market.

Output m²

10.2bn m²

Global production lines #

1,684

Functional Fluid Deposition

Xaar's focus on functional fluid promotes our inkjet technology, which offers an unrivalled method of non-contact, fluid deposition with incredible precision, control and speed. Typically applications are challenging, pushing our technology to and beyond known limits in markets such as Flat Panel Display, Semiconductors, Printed Electronics and Optics. There is an ever increasing interest in Xaar's inkjet technology as part of a manufacturing process, and through the work that we do we aim to develop these medium term applications into commercial opportunities.

Advanced Manufacturing: 3D Printing

3D Printing is a manufacturing methodology that encompasses a range of processes and applications, with a common theme of building parts up, usually layer-upon-layer. This additive approach ultimately enables manufacturers to eliminate the need for tooling. There are significant advantages, including superior geometric freedom, giving designers much more capability, and a substantial reduction in lead time for products. In addition 3D Printing provides the facility to tailor unique products to consumers, enable de-centralised manufacturing and shrink spare part storage.

3D Printing annual market growth rate %

23%

Glass Printing

Architectural glass is increasingly used to complement ceramic tiles in modern commercial design, and is starting to be used in residential projects also. Functional glass, such as car windscreens or glass tops used in induction hob cookers, is predominantly printed using analogue screen techniques, but is increasingly moving to digital to provide production flexibility and inventory reduction. This is an emerging sector for inkjet. The compound annual growth rate (CAGR) for inkjet printed glass is just under 10% for the next few years. Many glass printing applications involve jetting highly viscous inks which means that Xaar printheads with TF Technology are ideal.

Textiles

Textile printing for clothing and home furnishing using digital inkjet technology is growing fast due to rapid shifts in consumer demand and preferences as well as requirements to reduce waste and pollution. This drives the need for new, digital printing systems which are capable of delivering short print runs quickly, economically and in a more environmentally friendly way. Another reason for the growth in inkjet printed textiles is the increase in the use of digitally printed soft signage which offers environmental and logistical benefits.

Textiles annual market growth rate %

17.5%

Packaging

The main sectors for Xaar within the Packaging market are:

Coding & Marking

Coding & Marking is an application which relates to printing product identification codes such as batch numbers, use by dates and barcodes. Xaar's technology is used to print barcodes and logos on outer case/ secondary packaging of consumer goods. This is an established and stable business, and competes with alternative technologies including print and apply, and thermal inkjet.

Primary Labels

Labels are used for many different applications, including product identification, name tags, warning and hazard identification, promotions and as decals for product decoration. So far only 13% of this market has converted to digital printing to date. The change driver is the delivery of lower cost per copy on run lengths up to 100,000 impressions. There is a large range of substrates and inks in this application which adds complication to the conversion process. Xaar excels in two areas of label printing: colours (including white) and varnish based finishing effects using Xaar's High Laydown Technology.

Output m^2

68.3bn m^2

Direct-to-Shape

Direct-to-Shape is a relatively new application where bottles and containers have the image printed directly onto their surface without the need for a label. The solution is aimed at reducing unit costs versus the application of a label. This approach can also be used as part of the identity of a brand, and provides differentiation versus other products that use paper or plastic labels.

Product Printing

Product Printing is the practice of printing onto all kinds of industrial objects, including consumer and promotional items, packaging, medical, automotive, apparel, appliances, sports equipment and toys. For example, in China, the Xaar 1201 is used on flat bed printers to print highly colourful mobile phone cases.

Graphic Arts

The Graphic Arts sectors include Grand- and Wide-Format Graphics.

Grand- and Wide-Format Graphics

Grand- and Wide-Format Graphics (GWFG) includes both indoor and outdoor signage and advertising, including billboards, posters and point of sale advertising. It is the most mature industrial inkjet market, active for over 15 years. The Xaar 1201 has been positioned to target the Wide-Format Graphics markets in China, India and Latin America and beyond. Several OEMs have showcased Xaar 1201 based machines in large regional shows such as DPES in China and Media Expo in India in 2018 and early 2019.

OUR BUSINESS UNITS – PRINTHEAD continued

Xaar 5601

W&H chooses Xaar 5601 for its first digital printer for flexible packaging

Windmöller & Hölscher (W&H), leader in machinery and systems for the manufacturing and converting of flexible packaging, announced in September 2018 that its first digital, single-pass press for flexible packaging would be using Xaar 5601 printheads. W&H selected the printhead as a result of successful performance tests conducted in 2017.

"We are delighted to be developing our latest system using the Xaar 5601," commented Hermann Veismann, General Manager Business Unit Printing and Finishing at W&H. "We saw an opportunity for digital printing in flexible packaging, driven by the need for faster time-to-market and very short order lengths, and aim to overcome the traditional difficulties in this area using our expert knowledge and outstanding new technology."

"The new digital machine will be characterised by higher quality and higher speeds and opens up new possibilities in flexible packaging," explains Sven Michael, head of the W&H digital team. "It includes the Xaar 5601 printhead, which achieves excellent print quality at high production speeds."

The new digital machine will be characterised by higher quality and higher speeds and opens up new possibilities in flexible packaging.

Sven Michael,
Head of the W&H digital team

Xaar 5601 drives new product development at Neos

Based in Modena, Italy, Neos announced that it is developing print systems with Xaar 5601 for a variety of applications such as packaging and décor.

Whilst it is a newly formed company, Neos has a well-established inkjet heritage. "We were impressed when we first saw the printhead in action during a visit to Xaar and have been working closely with Xaar since then," comments Vincenzo Palumbo, who has an enviable reputation for delivering well-designed tailor-made print systems. "We made the decision to work with the Xaar 5601 based on its exceptional performance and also because it has some unique features, such as AcuDrp for print uniformity and software-only alignment capability for ease of use. These features will allow us to address key pain points of our target markets."

We made the decision to work with the Xaar 5601 based on its exceptional performance and also because it has some unique features, such as AcuDrp for print uniformity and software-only alignment capability for ease of use.

Vincenzo Palumbo
Neos

Xaar 5601 enables fast integration for KELENN Technology

KELENN Technology, renowned for producing a range of print systems which are simple in design and reliable whilst being technically advanced, has chosen the Xaar 5601 printhead for its latest document duplex printing system.

The company commenced its development project with the Xaar 5601 because the printhead delivers an outstanding cost model for end users alongside high definition print quality at very high speed. "We chose the Xaar 5601 because it allows us to produce a very competitive print system, offering real value to our customers," says Didier Rousseau, CEO at KELENN. "Xaar's support and knowledge sharing has been excellent. We pride ourselves on our ability to get to market quickly with our new products. For this particular project, the speed of development was helped by the close technical collaboration with all of the Xaar team. We looked at many of the MEMs printheads on the market; both Xaar and the Xaar 5601 came out on top."

OUR BUSINESS UNITS continued

Product Print Systems

Introduction to the Product Print Systems business unit

Engineered Printing Solutions (EPS) is a recognised leader in the industrial product marking machine industry providing highly automated machines and accessories, as well as providing an industry-leading service. EPS occupies a niche position as one of only a few bespoke product marking machine companies in North America.

Where we excel

Our core strengths are designing, building and integrating machines which allow our customers to product mark their parts in a highly automated manner, enabling significant cost savings and virtually unlimited print flexibility and personalisation.

What we achieved in 2018

In 2018, EPS made good progress with the introduction of two revolutionary system designs. The first was the design of a hard hat (MSA personal protection equipment) single-pass, multi-colour printer capable of individualised, personalised helmet marking. The second system design introduced was for robotic saw blade printers. Three were sold; one to MK Morse and two to Lenox/ American Saw. These machines are capable of printing on over 60,000 blades in an eight-hour shift.

In addition, EPS has been extremely successful in designing repeat bespoke machines for three major customers and has introduced innovative machine solutions for the personal protection, automotive, ad-specialty, sporting goods and construction tool industries.

Mid year we opened an office in Fremont, California in order to better serve customers on the west coast. The California office serves as both showroom for demonstrating machinery and also warehouse for inks, printheads, and other consumables.
We also further strengthened our sales team with the addition of new Sales Engineers, including a representative in Europe.
We also entered into an exclusive North American distributorship agreement with Machines Dubuit to distribute their cylindrical inkjet printers.

Priorities for 2019

Looking ahead, we believe we have a significant opportunity to be a leader in the conversion of analogue product marking systems to high-speed digital product marking platforms using new inkjet technology (printheads, electronics, and specialty inks) that will allow customers to obtain a significant competitive advantage in their respective markets.

Product portfolio overview

The EPS product portfolio focuses on three major technologies:

XD70

rJet24

Digital High-Speed Single-Pass
This platform is best suited for print flexibility, variable image construction and high run rates. EPS has been investing significant funds in the development of this platform since 2007 as it sees this business segment as its largest growth opportunity.

Digital Multi-Pass Scanning Systems
This technology is a lower cost, entry level approach to digital inkjet printing that is capable of producing high quality, high resolution images at a slower speed, but allows for image variability across multiple parts.

Xe16

Within the three product portfolios, analogue printing will continue to remain competitive, but the consumer driven internet-of-things will continue to challenge those systems that will in some instances be replaced and supplemented by digital printing technologies due to the requirement for variable data and personalisation.

In all three product portfolios, one of the key points that separates EPS from its competition is its ability to integrate and automate the product marking process. This includes robotic auto load and unload, part fixturing, part conveyance, pre-treating and post-print curing. EPS has designed and built standalone systems as well as drop-in integration solutions.

Analogue Systems
Pad Printing which employs machine heads, inks, silicone pads and clichés to produce a printed product. This technology is well-suited for long production runs that do not involve the changeover of artwork.

OUR BUSINESS UNITS – PRODUCT PRINT SYSTEMS continued

XE-Robot pad printing work station – the definition of adaptable

In order to satisfy the product marking requirements for Stihl, Inc. and to *provide a multi-faceted work station adaptable to manufacturing and* assembly applications, EPS created the XE-Robot.

A four-axis SCARA (Selective Compliant Articulated Robot Arm) robot is programmed to select from six pads of different shapes and sizes, and pick up a variety of inked images from six clichés, each with its own ink cup. Furthermore, the two-axis fixture assembly allows printing on five sides of the part, in multiple locations on each side.

Beyond the silicone printing pads, the robot can be programmed to retrieve a pick-and-place hand, which can load and unload parts on the fixture between print cycles. A tool can take the place of one of the pads, allowing the robot to perform drilling, screwing or assembling functions in addition to printing.

Julian Joffe said "The EPS Robotic Pad Printing Work Station can be reprogrammed for changes in product lines, as well as for manufacturing and assembly uses beyond product marking."

In today's economy, manufacturers want to be assured that their tools can perform a variety of tasks and be flexible enough to use for many projects – and years – to come.

Julian Joffe
President, Commercial Services

Catheter printers

In the 1990s, EPS (then known as Pad Print Machinery of Vermont) started building its first 360-degree catheter printer, capable of efficiently printing bands on catheters to identify the depth marks for medical practitioners. The unique concept was soon developed and became rapidly adopted.

During the early part of 2010 EPS started building a servo controlled version of the catheter printer. Existing and new customers realised the value of this design which was easier to set up and could be programmed for a variety of product styles and varieties of images.

Today EPS is a well-known supplier of these types of printers and has sold them in the US, Ireland, Korea, Central America, Mexico and Canada. The medical device sector remains a key business area for the Company.

OUR BUSINESS UNITS continued

3D Printing

Introduction to the 3D business unit

Xaar 3D is developing industrial grade products and services based on sintering technologies and the High Speed Sintering process. These products and services are targeting the fast-growing opportunities of low to medium volume part production by 3D Printing.

Xaar 3D is an independent legal entity and constitutes of Xaar 3D Ltd and Xaar 3D ApS and is funded by investments from Xaar and Stratasys Solutions Ltd. Its core strength lies in its capabilities and experience in machine design and development including powder management and thermal control, as well as years of experience in application and materials development for powder sintering applications.

In order to maximise the revenue opportunity and expedite time-to-market for Xaar 3D's products the Company has entered a partnership with global leading 3D Printing company Stratasys as well as with a global manufacturer of equipment. In addition, Xaar 3D is working closely with materials suppliers and end-customers to assure the completeness of its product offering.

3D printed parts for industrial applications; post processed and dyed black.

Where we excel

Our technical expertise in High Speed Sintering is world-leading; our team has achieved the highest standards of powder bed thermal control in 3D Printing in a low-cost product architecture. In addition our process and application team, including the technology's original inventor, bring unparalleled experience into the design of the product. The fusion of this knowledge has generated technology ideas under patent application and know-how that is enabling the production of parts at quality and price points that are capable of pushing the boundaries on industrial production via 3D Printing.

What we achieved in 2018

The majority of our technical developments in 2018 remain confidential. However successful demonstrations of our technology to industry leaders in 2018 culminated in the commitment from Stratasys to make a significant investment in Xaar 3D. Our technology development has progressed to a point where it is now clear that our products will enable customers to achieve industrial production in a way that the 3D Printing industry has not seen to date. In addition, we have continued to build our team capabilities with skills that will enable us to scale up our activities in 2019.

Priorities for 2019

In 2019 we will scale up our commercialisation activities, preparing our products for commercial launch. We will have more qualified customers' input into the development and will complete functionality of the first product. We will also start ramping up go-to-market activities including acceleration of training, supply chain development and sales activities.

3D printed parts for industrial applications; post processed and dyed black.

Our technologies

Our core technologies are predominantly based on unique implementation of the High Speed Sintering process which is integral to our products. We are finding new ways in which our core technology can be integrated into a wider production ecosystem; through this holistic approach we expect our products to enable our customers to achieve new levels of production capability.

Our markets and opportunities

Xaar 3D is focused on enabling industrial production of products via 3D Printing, specifically High Speed Sintering. CAGR of 3D Printing is approximately 23% and the aspect to which we are focused, end part production – rather than prototype part production – is growing at a rate higher than the overall 3D Printing industry. Core applications for our products will be in aerospace, consumer products, industrial and scientific equipment and automotive.

Stratasys partnership

Our partnership with Stratasys – the world's largest 3D Printing company – is a prime indicator of the potential of the technology that we have developed and demonstrated. By combining the complementary assets of Xaar 3D and Stratasys we are gearing up to take a major place in the fast growing field of industrial 3D Printing (aka Additive Manufacturing).

STRATEGIC REPORT

CHIEF EXECUTIVE OFFICER'S REPORT

Diversifying revenue streams and getting closer to our end customers

Our transformation journey continues with the implementation of a new three business unit structure.

Doug Edwards
Chief Executive Officer

Xaar 5601 printhead technology is celebrated

In January 2019 we celebrated the ground-breaking technologies of our Xaar 5601 printhead in an event for over 300 of our UK staff.

The Xaar 5601 is the culmination of over eight years of Research & Development. The technology platform represents a major step forward in digital inkjet printing and has created a foundation for Xaar's Thin Film printheads of the future.

"We wanted to create a new platform with capabilities that we didn't have at the time. Specifically, we wanted to develop an aqueous printhead, with higher resolution, higher printing speed and higher print quality," comments Ramon Borrell, Chief Technology Officer.

Critical to progress to date has been the time and effort we put into visiting customers throughout the development programme to ensure we captured and delivered solutions to the key OEM and end user pain points.

Understanding customer and market requirements was key to the development of the Xaar 5601.

Ramon Borrell
Chief Technology Officer

Operational highlights

- Xaar 5601 Thin Film printhead being integrated and evaluated by more than 20 OEMs across packaging, commercial, textiles and décor segments. Three OEMs have announced publicly (Windmöller & Hölscher, Neos and KELENN Technology)
- Formation of Xaar 3D Limited announced in July, the joint investment with Stratasys First Beta High Speed Sintering printer placed in December 2018
- EPS signed a distribution agreement with Machines Dubuit to distribute exclusively its product portfolio in North America.

Three years ago Xaar was a business reliant upon a single technology with strong dependence upon sale of a single printhead product to the Ceramics market. Addressing this vulnerability and improving the sustainability and predictability of our business was at the core of our strategy to diversify and to get closer to end customers by becoming an OEM ourselves in two carefully selected areas. These two areas, 3D Printing and Product Print Systems which we have further strengthened during the year, now represent two of our three business units.

In July we announced the formation of Xaar 3D Limited, a joint investment with Stratasys, a market leader in additive manufacturing, to develop 3D printing solutions based on High Speed Sintering technologies. Xaar holds 85% of the shares with Stratasys holding 15%. In addition Stratasys has been granted the option to increase its ownership up to 30%.

In Product Print Systems we have partnered with Machines Dubuit of Paris, France to distribute exclusively their product portfolio in North America through EPS. Their portfolio is complementary to that of EPS, focussing on the conversion of the analogue screen printing process to digital, whereas EPS targets the conversion of pad printing to digital.

Disappointingly, these positive developments are set against challenges in our printhead business with a significant decline in our legacy Ceramics business and the slower than anticipated ramp of our new Xaar 1201 Thin Film printhead, which was launched to re-establish Xaar in the Wide-Format Graphic market, mainly in China. This Ceramics printhead revenue decline overshadowed the new product growth of our Xaar 1003U, Xaar 2001, Xaar 501 and Xaar 502 printheads in the emerging digital market applications of Packaging, Coding & Marking, Décor, Architectural Glass Decoration and Direct-to-Shape/ Product Printing along with the progress we have made with our Xaar 5601 Thin Film printhead.

Our Xaar 5601 Thin Film product is ground breaking and a phenomenal achievement for a company of our size. Now in the hands of multiple OEMs across commercial, packaging and textile printing. Three of the OEMs, Windmöller & Hölscher, KELENN Technology and Neos announced publicly their choice of Xaar 5601 for their next generation digital presses and printers.

Business Unit Performance
Printhead

Segments

It has been an extremely challenging year for our Printhead business with revenue declining by £36.3 million (42%) year over year. The lion's share of the decline, £26.6 million, being in Ceramics and associated royalties. The largest contributor in the Printhead business despite the decline in Ceramics continues to be the Industrial segment with revenues of £17.6 million (59% decline versus 2017).

The Packaging segment, now the second largest behind Industrial, grew by 16% and at £16.6 million now represents one third of the total Printhead business revenues. This growth was primarily in Coding & Marking and Direct-to-Shape sectors.

Sales in Graphic Arts declined by 65% or £8.3 million largely due to the printer integration issues experienced with our Xaar 1201 printhead in China.

Revenues from Royalties were £11.1 million (2017: £16.4 million) and in line with expectations having entered into a £20 million agreement for a fully paid up licence from Seiko Instruments Inc. (SII) in November 2017.

Bulk Piezo

From a product standpoint we have seen growth in our Xaar 501, Xaar 502, Xaar 318 and Xaar 2001 Bulk piezo printheads across Packaging, Décor, Coding & Marking and Direct-to-Shape printing. However, this growth in new products doesn't mitigate the significant decline in our Xaar 1003 Ceramics printhead of over £20 million. The replacement market, for which the Xaar 1003 printhead was designed, has experienced significant pricing pressure and has not proven to be as robust as we anticipated as new printer installs have often been preferred.

CHIEF EXECUTIVE OFFICER'S REPORT continued

We are making progress in transforming Xaar into a more diversified and customer centric organisation.

Our Xaar 2001 printhead although gaining traction, still only represents roughly 10% of all new printer installs.

We continue to rightsize the Bulk business and it remains cash and earnings positive despite the Ceramics decline.

Thin Film Piezo

We have two Thin Film product offerings; Xaar 1201 and Xaar 5601 both utilising the same wafer fab for the production of actuators. Not only did we see a market requirement for the Xaar 1201 product in Wide-Format Graphics but anticipated volumes of this product formed an important part of the early purchase commitment necessary to secure supply of actuators for the Xaar 5601.

Unfortunately we have experienced integration and quality issues with our Xaar 1201 product which, although now behind us, resulted in a much slower than anticipated ramp of this product. This in turn has led to inventory build which we expect to reduce as shipments of the Xaar 1201 increase.

We have experienced delays in the introduction of our Xaar 5601 Thin Film printhead as we moved through the initial production process, but with these teething issues dealt with, it is now being integrated into the next generation of printers and presses of five major OEMs and is under evaluation currently with more than a further 20 across all major print segments.

Strategic review

As a result of the challenges in our Printhead business we announced back in September a strategic review of more extensive partnership options. In the last six months we explored a number of structural options with third parties supported by advisors, which have not so far produced any proposals which can be recommended to shareholders. We continue to believe that closer alignment with a strategic partner or partners is key to gaining the necessary scale for sustainable and predictable growth in this business. Nowhere is this more important than in the area of Thin Film technology where scale is an essential ingredient for success.

In digital print worldwide, Thin Film looks to be the winning technology from a cost, quality and performance standpoint. Based on its performance and ability to jet aqueous inks there is a strong belief that Thin Film will be chosen where possible over solvent inks. This is confirmed by the fact that most of the major printing companies are either investing directly or through partnership in Thin Film solutions and as a result there is a wealth of intellectual property in this field.

An additional challenge with Thin Film is that the core component of the printhead is a silicon MEMS actuator which requires a wafer fab for its production. Not only is this type of plant a significant investment for our suppliers but major volumes are required to make it economically viable. Partnership is therefore critical to provide the necessary scale.

Xaar is now nine years into its Thin Film investment. We have explored a variety of partnership options starting with the one we announced in 2016 with Ricoh. This partnership, providing valuable IP coverage and wafer fab volume consolidation, has been a core component of our strategy. It is this type of partnership, in conjunction with the large number of OEMs working with our Xaar 5601 for integration into their next generation machines across a wide range of applications, that provides strong evidence of the potential for Xaar's Thin Film product and technology.

However, we recognise that we are some years away from reaching meaningful volumes in Thin Film and in order to continue to fund this activity at the level which will enable Xaar to realise the full potential value of our portfolio, we are seeking, in addition to licensing arrangements, strategic investment.

The conclusion of the review we have engaged in is that deeper partnerships of this type would bring the necessary scale for long term sustainability. We have entered into early discussions with relevant industry parties on a range of potential structures for our Thin Film business.

3D Printing

We announced the formation of Xaar 3D Limited in July. Stratasys invested $4 million for a 15% shareholding, with an option to invest further to increase its ownership up to 30%.

Stratasys will brand and take to market Xaar 3D's High Speed Sintering printer. The first printer was installed at a customer in Denmark in December 2018, and so far feedback has been positive. A further five printers have been produced and are running up to 12 hours a day building parts at our facility in Copenhagen, Denmark.

Once the printer design is frozen at mid-2019, production will move to our contract manufacturer, one of the largest in the world with annual revenues in excess of $20 billion.

We have a proven technology, strong management team, a powerful go-to-market partner and strategic investor, with an exciting market opportunity ahead of us.

Product Print Systems

Revenue in the Product Print Systems business remained flat year over year.

In our digital product portfolio, we have seen a shift in our pipeline to higher value solutions. These higher value customised integrations are more complex and do take longer to achieve customer sign off and hence revenue recognition.

Although our focus is on the digital conversion of the analogue pad printing process, it is worth noting that pad printing is stable and our installed base of printers continues to drive ink and service annuities.

Despite our partnerships with Comec Italia and Machines Dubuit, EPS continues to be a US focused business. There remains a consolidation and digital conversion opportunity in this $3.5 billion pad printing market (source: Smithers Pira). We have an acquisition target shortlist, but our priority has been to address our Printhead business challenges before pursuing.

People

Over the past three years we have significantly reduced headcount in our Printhead business in line with the revenue decline. Headcount in our Printhead business has reduced by 42% in the last three years, including a reduction of over 100 in 2018. This has been largely in the manufacturing area and focused on the Bulk printhead business. Clearly this is a challenging environment for our printhead employees.

Meanwhile we have been investing in Thin Film, and the 3D Printing and Product Print Systems businesses.

I would like to thank our staff for their efforts, particularly in the Printhead business where we are dealing with a challenging business situation.

Brexit

The Group operates globally and may be affected by Brexit developments, which could provide a number of challenges for Xaar. The Group is continuously monitoring events and putting mitigating actions in place. One of the greatest challenges continues to be concerning EU workers and migration. Trading with our EU customers could be more complex. Any actual or perceived barriers to free trade are an obvious area of concern for us. As a result of Brexit, the Group is exposed to potential currency fluctuations, although not significant. Brexit and trade barriers continue to be an integral part of the Group's ongoing risk management and review process, for which solutions to address the risks identified are explored and implemented. Although there is still uncertainty surrounding the outcome of Brexit, we do not expect the direct consequences of Brexit to have a material impact on the Group.

Summary and outlook

We are making progress in transforming Xaar into a more diversified and customer centric organisation.

Challenges clearly remain in our Printhead business and we are taking a number of mitigating actions to address these. Our strategic review has highlighted the preferred way forward, including seeking strategic investment partners for our Thin Film activities and we are focused in 2019 on bringing this process to a conclusion.

The opportunities that this process can bring, combined with the prospects that exist for our new Printhead products, both Bulk and Thin Film, and in our new business areas of 3D Printing and Product Print Systems, combine to make an exciting future for Xaar, even with some risks plainly in view. We remain determined to deliver these benefits to our shareholders.

Doug Edwards
Chief Executive Officer
21 March 2019

CHIEF FINANCIAL OFFICER'S REPORT

Streamlining for the future

One of our key financial priorities for 2019 is to unwind working capital to levels commensurate with the size of the business.

Shomit Kenkare
Chief Financial Officer

Summary of financials

	2018	2017	2016
Revenue £m	**£63.5m**	£100.1m	£96.2m
Gross margin %	**38.5%**	47.0%	46.4%
Gross research and development expenses £m	**£15.0m**	£18.1m	£22.4m
Operating margin %	**(23.8%)**	12.1%	18.1%
Adjusted operating margin %	**(18.7%)**	17.8%	19.8%
(Loss)/profit before tax £m	**(£14.9m)**	£12.3m	£17.9m
Adjusted (loss)/profit before tax £m	**(£11.7m)**	£18.0m	£19.5m
Diluted earnings per share	**(16.0p)**	14.0p	18.9p
Adjusted diluted earnings per share	**(9.7p)**	20.7p	21.2p
Net cash and treasury deposit balance £m	**£27.9m**	£44.7m	£49.3m
Net cash flow £m	**(£16.8m)**	(£4.6m)	(£20.4m)

Adjusted measures exclude items from the IFRS operating profit/(loss) margin and profit/(loss) before tax, such as restructuring and investment expenses, share-based payment charges, exchange differences on intra-group transactions, exchange differences on derivatives and research and development expenditure credit, per the reconciliation of adjusted financial measures on page 100. Gross research and development expenses includes capitalised development costs and excludes amortisation of capitalised P4 development costs. Net cash includes cash and cash equivalents, and treasury deposits.

2018 has been a tough year for the Group. Revenue for the year was £63.5 million, £52.4 million excluding licence royalties, which represents a decline of 37% year on year. Adjusted operating loss margin of (18.7%) (2017: profit margin of 17.8%) incorporates the gross margin impact from the decline in revenues, the impact of higher net Research and Development (R&D) investment and additional provisions for slow moving inventory and past due debtors of £7.0 million. Net cash at 31 December 2018 was £27.9 million (including treasury deposits of £3.3 million; net cash at 31 December 2017: £44.7 million, including treasury deposits of £0.8 million), reflecting continued investment in our Thin Film platform and High Speed Sintering 3D printer technology, and the working capital build due to slower new product sell through.

Revenue
The Group achieved total revenue for the year of £63.5 million (2017: £100.1 million) representing a 37% decrease.

Printhead
The £36.3 million decline in revenues by segment is covered in detail in the Chief Executive Officer's report.

By region, Asia was the hardest hit region, largely comprising of China, where revenue declined by £31.2 million. The balance of the decline was in the EMEA region and was partially offset by growth in the Americas.

Printhead revenue by region £ million	2018	2017	Change
EMEA	**22.7**	29.7	-24%
Asia	**19.8**	50.9	-61%
Americas	**7.3**	5.4	+35%
Total	**49.8**	86.1	-42%

Printhead revenue by region £m

2018	*EMEA:*	**22.7**
	Asia:	**19.8**
	Americas:	**7.3**
2017	*EMEA:*	**29.7**
	Asia:	**50.9**
	Americas:	**5.4**

Product Print Systems
Revenues in the Product Print Systems business were £13.7 million (2017: £14.0 million). This business is predominantly US Dollar denominated and revenues were flat in local currency terms, negated at Group level by the impact of currency fluctuations.

3D Printing
This business remained in a pre-revenue phase of development throughout 2018. We made our first Beta unit printer placement in December 2018 and expect to report first product revenues during 2019.

Group
As a supplier of technology to OEM partners, our geographic sales split reflects where our OEMs are located, which is not necessarily the end-user location.

In 2018 Europe, Middle East and Africa (EMEA) was the Company's largest sales region. Revenues from EMEA accounted for £22.8 million (2017: £29.8 million), representing 36% of the Group's revenue. The decline was due to the drop in volume in the Industrial segment led by the Ceramics sector, partially offset by the traction we have gained in the Packaging segment, principally in Décor applications.

The Americas, with a total revenue of £21.0 million (2017: £19.4 million), grew 8% and now represents 33% of the Group's revenue. Much of the growth in the Americas came from the Coding & Marking sector within the Packaging segment.

Sales to Asia amounted to £19.8 million (2017: £50.9 million), representing 31% of the Group's revenue. This significant reduction is mainly due to the loss of volume in the Ceramics sector, lower than expected volumes in the Wide-Format Graphics and Textiles sectors, and the expected decline of licensing income.

We continue to keep our capital expenditure at low levels with the majority of our spend being capitalised development costs associated with our 3D Printing business.

Net R&D spend £m

£14.7m

(2017: £12.3m)

Profitability

The Group reported an IFRS operating loss of £15.1 million and an adjusted operating loss of £11.9 million which excludes the impact of the items listed in the reconciliation in note 4. The overall adjusted operating margin in 2018 was (18.7%) (2017: 17.8%). This decline in profitability of £29.7 million is due to a combination of factors:

1. A 37% reduction in revenues resulting in a £22.6 million reduction in gross profit. The key drivers for this reduction are:
   a. Decline in the Industrial and Graphics segments revenues, which carry a much higher margin profile than most of the rest of the portfolio, partially offset by growth in revenues in the Packaging segment
   b. Reduction in licence income of £5.3 million
   c. As a result of the delays associated with OEM products in the Wide-Format Graphics sector in China, the Group has significantly increased its inventory levels. While we have no specific indication of permanent impairment of these balances, we have made prudent provisions of £2.5 million to reflect the uncertainties associated with sell through of these products
   d. Lower absorption of factory costs as a result of the overall reduction in volumes, partially offset by headcount and fixed overhead reductions at our Huntingdon factory.
2. Increase in R&D by £2.4 million due to:
   a. Further reduction in gross spend of £3.1 million, primarily as a result of maturity of the Bulk printhead technology and transfer of the integration and applications department to Sales and Marketing to aid customers with post launch installation
   b. This reduction in gross spend is offset by an overall decrease of £4.6 million in capitalised development expenditure; £1.0 million increase in 3D capitalisation, and £5.6 million reduction in capitalisation of the P4 Thin Film technology, which we ceased capitalising and commenced amortisation in August 2017. As a result the year on year amortisation expense increased by £0.9 million.
3. Increase in Sales and Marketing expenses of £1.2 million primarily due to the transfer of the integration and applications department, previously reported in R&D, to help customers with post launch installation.
4. General and Administrative expenses and impairment losses on financial assets increased overall by £3.5 million, driven primarily by the delays associated with OEM products in the Wide-Format Graphics and Textiles sectors in China as described in point 1c. above, and provisions taken. The Group had to provide extended credit terms to debtors that resulted in increased working capital. While we have no specific indication of permanent impairment of these debtor balances, we have made prudent one-off provisions totalling £4.5 million to reflect the uncertainties associated with recovery of the debt. Partially offsetting these increases is a favourable foreign exchange movement of £1.2 million.

R&D spend £ million	2018	2017	Change
Gross R&D spend	**15.0**	18.1	-3.1
Capitalisation	**(1.9)**	(6.5)	+4.6
Amortisation	**1.6**	0.7	+0.9
Net R&D spend	**14.7**	12.3	+2.4

Adjusted loss before tax of £11.7 million was recorded for 2018 (2017: profit of £18.0 million). Loss before tax as reported under IFRS was £14.9 million (2017: profit before tax of £12.3 million).

The tax credit on adjusted loss before tax was £4.2 million (2017: charge of £1.9 million), representing an effective tax rate of 36% (2017: 10%), impacted by the reduction in the deferred tax asset relating to share options and the significant R&D expenditure credit in the year. The tax credit on IFRS loss before tax was £2.6 million (2017: charge of £1.4 million) representing an effective tax rate of 17% (2017: 11%). The rise in effective tax rate is a consequence of the loss before tax position in 2018, compared to a profit before tax position in 2017.

Effective from 1 January 2018 the US corporate income tax rate reduced from 35% to 21%. This did not have a significant effect on the Group's tax rate for 2018 and is not expected to have a significant impact in the short term either.

Adjusted loss after tax for 2018 was £7.5 million (2017: profit after tax of £16.1 million) and adjusted diluted earnings per share was (9.7) pence (2017: 20.7 pence).

Financial position

The Group ended the year with a net cash position of £27.9 million, but carried working capital that is at an excessive level. One of our key financial priorities for 2019 is to unwind working capital to levels commensurate with the size of the business.

We continue to keep our capital expenditure at low levels with the majority of our spend being capitalised development costs associated with our 3D Printing business. We saw a reduction in our property, plant and equipment expenditure in the year of £2.5 million (45%) and a reduction in our capitalised development expenditure in the year of £4.6 million (71%).

Operating cash outflow, before movements in working capital, was £8.7 million (2017: inflow of £25.2 million). The change in working capital during the year represented a net cash outflow of £0.7 million. Receivables decreased £9.4 million and inventory increased by £12.8 million reflecting delays in revenues from our Xaar 1201 printhead. This working capital impact was however offset by a significant reduction in capital expenditure for the Group. Total cash outflow relating to intangible and tangible assets was £4.5 million in the year (2017: £12.0 million), including £1.9 million (2017: £6.5 million) of capitalised development expenditure. Dividends accounted for £6.0 million (2017: £7.7 million) of all cash outflows.

Intangibles

Intangible assets excluding goodwill were £32.8 million at 31 December 2018 (2017: £32.7 million). These assets are largely associated with the Thin Film development project which was capitalised between 2014 and 2017. Amortisation of this project commenced in August 2017 after the design was frozen and development kits were made available for sale. We are amortising this technology platform over a 20 year period. In addition, £1.9 million (2017: £0.9 million) was capitalised relating to the development of a new 3D Printer technology platform.

Treasury and currency management

Cash and the liquidity profile of the Group are being managed carefully. With a more diversified business model as well as sourcing from strategic partners across the globe, the Group has increased exposure to foreign exchange risk, in particular to the US Dollar and Japanese Yen. As much as possible, we match our billing currencies to our settlement currency to achieve a natural hedge.

Dividend

In 2014 we announced a sustainable and progressive dividend policy which took into account the Group's future prospects, its underlying profitability and the future cash requirements of the business at the time. The 37% decline in revenue in 2018 resulting in an adjusted loss before tax of £11.7 million, alongside the pending outcome of the strategic review, has led the Board to revisit this policy. In addition, the joint investment in 3D announced in July with Stratasys has committed both parties to fund commercialisation of those products. As a result, the Board will not be recommending the payment of a final dividend for 2018 at the forthcoming Annual General Meeting (AGM), giving a total dividend for the year of 1.0 pence per share (2017: 10.2 pence). An interim dividend of 1.0 pence per share was paid during the year (2017: 3.4 pence).

The Board will continue to keep the dividend policy under review.

Shomit Kenkare
Chief Financial Officer
21 March 2019

STRATEGIC REPORT

KEY PERFORMANCE INDICATORS

Monitoring our progress

Revenue by sector £m

	Industrial	Packaging	Graphic Arts	Royalties
2018	17.7	30.2	4.5	11.1
2017	42.6	28.3	12.8	16.4
2016	46.0	29.0	7.9	13.3

Declining Ceramics revenue in the Industrial sector and associated Royalties. Packaging growth primarily in Coding & Marking and Direct-to-Shape.

Revenue by region £m

	EMEA	Asia	Americas
2018	22.7	19.8	21.0
2017	29.8	50.9	19.4
2016	41.7	36.4	18.1

The significant reduction in revenue from Asia is due to sales decline in the Ceramics sector, lower than expected sales in the Wide-Format Graphics and Textiles sectors, and the expected decline of licensing income.

Gross margin %

38.5%

(2017: 47.0%)

2018	38.5
2017	47.0
2016	46.4

Gross margins have been impacted by an aggressive decline in Industrial and Graphics segments and reduction in Licensee Royalties.

Gross R&D investment £m

£15.0m

(2017: £18.1m)

2018	15.0
2017	18.1
2016	22.4

Gross R&D investment is defined as net capitalisation/amortisation of development costs relating to the Thin Film and 3D programmes.

Gross R&D spend has decreased as new products are delivered to market and resources are made available to strengthen go-to-market activities.

Operating margin %

(23.8%)

(2017: 12.1%)

2018	(23.8)
2017	12.1
2016	18.1

Operating margin has been adversely impacted by the reduction in and product mix of revenue, the decline in higher margin products, reduction in Licensee Royalties, launch delays of OEM products and lower absorption of factory costs.

Adjusted (loss)/profit before tax £m

(£11.7m)

(2017: £18.0m)

2018	(11.7)
2017	18.0
2016	19.5

Adjusted (loss)/profit before tax is taken from note 4 in the financial statements.

(Loss)/profit before tax £m

(£14.9m)

(2017: £12.3m)

2018	(14.9)
2017	12.3
2016	17.9

(Loss)/profit before tax has also been adversely impacted by increased restructuring and investment expenses.

Net cash £m

£27.9m

(2017: £44.7m)

2018	27.9
2017	44.7
2016	49.3

The Group maintains a net cash position of £27.9 million, but carries working capital at an excessive level. A key priority for 2019 is to unwind working capital to levels commensurate with the size of the business.

Adjusted measures exclude items from the IFRS profit/(loss) before tax, such as restructuring and investment expenses, share-based payment charges, exchange differences on intra-group transactions, and research and development expenditure credit, per the reconciliation of adjusted financial measures on page 100. Gross research and development expenses includes capitalised development costs and excludes amortisation of capitalised P4 development costs. Net cash includes cash and cash equivalents, and treasury deposits.

RISK MANAGEMENT

Managing our risks

Key risk areas

The risks around our business are set out in more detail on pages 30 to 33, but the key risk areas can be identified as being associated with the following:

Market

Competition
Maximising returns over the long term in the target application through early adoption to achieve a market leading position and then retention of that position.

Identification of market requirements
Successfully developing products with the characteristics that meet market requirements within the necessary timescale.

Commercialising and maintaining products with cutting edge technology
Creating value by generating innovative products.

Merger and acquisition opportunities
Seek opportunities to expand, create synergies and generate greater shareholder value.

Operational

Organisational capability
Having the right people in the right roles.

Brexit
Tracking the potential impact of the UK Government's negotiations.

Manufacturing facility
Diversifying products, locations and manufacturing partners to alleviate operational issues.

Partnerships
Working with the right companies, at the right time on the right terms to deliver long term value.

Inventory obsolescence
Holding inventory levels that are not in excess of normal demand.

Financial

Ability to access sufficient capital
Ability to access sufficient capital to fund growth opportunities.

Customer credit exposure
Offering credit terms ensuring recoverability is reasonably assured.

Exchange rates
Monitoring global economic events and mitigating any resulting significant exchange rate impacts.

Effective risk management is key to our success against the dynamics of the industry that we operate in and the characteristics of our chosen business model.

The printing industry in which we operate is overall declining in terms of total output, tends to be capital intensive, is slow to react to change and is resistant to the adoption of new technology. Analogue printing processes are declining rapidly particularly in areas such as Commercial print (transactional documents and publications) where electronic media and digital printing processes are becoming more widespread. However in areas such as Packaging and Textiles, analogue processes are still dominant and the conversion to digital still modest.

The first approach to managing these risks is to have high quality individuals within the necessary functions that these risks tend to fall into. Other examples of the effective day to day management of these risks include operating multi-functional teams to share knowledge across the business, having regular stage gates in the management of development programmes, and the regular assessment of manufacturing capacity against future potential needs. In addition to day to day processes the Group's risk register is formally reviewed twice per year at senior management and Board level, including the assessment of the performance of risk management during the preceding period.

The Board has applied principle C.2 of the UK Corporate Governance Code (principle O. of the 2018 UK Corporate Governance Code) by establishing a continuous process for identifying, evaluating, and managing the significant risks the Group faces which has operated throughout the year and up to the date of this report. Such a system is designed to manage rather than eliminate the risk of failure to achieve business objectives and can only provide reasonable and not absolute assurance with respect to the preparation of financial information and the safeguarding of assets against material misstatement or loss.

In compliance with the provision C.2.1 of the UK Corporate Governance Code (provision 28. of the 2018 UK Corporate Governance Code), the Board regularly reviews the effectiveness of the Group's system of internal control. The Board's monitoring covers all controls, including financial, operational and compliance controls and risk management systems. It is based principally on reviewing reports from management to consider whether significant risks are identified, evaluated, managed and controlled and whether any significant weaknesses are promptly remedied and indicate a need for more extensive monitoring. The Board has also performed a specific assessment for the purpose of this Annual Report. This assessment considers all significant aspects of internal control arising during the period covered by the report. The Audit Committee assists the Board in discharging its review responsibilities.

STRATEGIC REPORT

RISK MANAGEMENT continued

A reminder of our business units

Printhead **Product Print Systems** **3D Printing**

Risk and link to business unit	Impact	Mitigation	Likelihood Magnitude Change
Market			
Competition	We compete on the basis of our technology, innovation, price, quality, reliability, brand, reputation and customer relationships. Failure to continually improve in these areas may mean that we lose market share or have to reduce prices. Since there are fixed factory costs, reductions in sales volumes may substantially lower profit margins. We are the only true independent printhead company in the world and we are competing with vertically integrated large scale multinational companies.	Competitive pricing policies are employed and product portfolios and pricing are constantly monitored against competitors. Our recent strengthening of our go-to-market capabilities allows us to focus more on our customers and also increase our ability to monitor competitor activity. Manufacturing cost reduction programmes are established to ensure that products remain competitive. Information from customers, partners, market reports and other sources are collected, consolidated and reviewed to improve forecasting. Continued investment in innovative technologies. Through selected partnership agreements we have extended our product range and expanded our market access.	Probable High
Failure to identify market requirements	Products need to meet the changing demands of the market, including regulatory changes. Failure to meet future market requirements/ specifications could impact on long term revenue and profit.	Regular, specific and detailed reviews are held to assess current and anticipated market requirements, including expected regulatory changes. These reviews include input from customers and other external sources. Product developments are selected on appropriate criteria. Product development activity is properly managed with regular reviews of progress against project plans, and gated milestone reviews. Appropriate resource is applied to product development activity. We have a rigorous product lifecycle management process which ensures we focus on our customers.	Possible High

Key of change

Increased No change Decreased

Risk and link to business unit	Impact	Mitigation	Likelihood Magnitude Change
Commercialising and maintaining products with cutting edge technology	We aim to produce quality end products. Failure to meet the required quality standards could have an impact on products that have been sold or that are held in inventory. This could lead to: • Unexpected costs associated with resolving the issues • Possible warranty costs, customer compensation or write-down in inventory values • Potentially longer term revenue loss if customers move to competitors and damage of reputation. We operate in an increasingly dynamic and changing environment. To counter the risks associated with this and, most importantly, to exploit the opportunities it presents, we must embrace innovation, protect our Intellectual Property and capitalise on technology advancements to ensure we maintain our market position.	The quality of supplies is constantly monitored. Quality performance is regularly reviewed by senior management who apply appropriate resources to systematically address recurrent problems. New products are thoroughly tested before launch. Xaar's manufacturing facilities are ISO 9001 accredited. Customer returns are reviewed quickly using a consistent and thorough investigation process. We have continued to focus on innovation. This is evidenced by our continued focus on R&D spend and the number of new products brought to market.	Possible Medium
Merger and acquisition opportunities	One of our objectives is to grow the business both organically and by acquisition. There are risks that potential M&A opportunities are either not identified or not managed effectively, leading to loss of revenue or increased costs. Alternatively, unsuitable M&A projects are undertaken, leading to a loss of shareholder value and profit. There are many risks and opportunities arising from external acquisitions. Planning, implementation and management of changes are essential and failure to get this right could lead to lost synergies and increased costs.	If a potential M&A is identified, robust modelling of the opportunity will be undertaken. Should a transaction proceed, clear objectives are set with ring fenced resource to enable successful integration of the acquired business. We have robust due diligence procedures and plan for integration of the target as part of the due diligence process. At each stage of any acquisition process we undertake a thorough review with the Board.	Possible Medium
Operational			
Organisational capability	Our people remain key to our business. Ensuring the right people are in the right roles is critical to our future success and growth. We need to attract and retain the right talent to enable achievement of our strategic aims. Failure to do this risks delivery and growth as follows: • Lack of staff to meet a specific business need or contract requirement • Loss of project specialisms • Single point of failure • Loss of key skills.	Our focus is to minimise the voluntary turnover of employees, through better hiring for fit, improved induction procedures and employee engagement initiatives. Xaar has a talent fast track programme in place to retain and progress key talent at all levels. A suite of Learning and Development courses (XCEL) has been rolled out across the Company to ensure key skills are maintained and enhanced. There are also regular departmental reviews for succession planning.	Possible Medium

RISK MANAGEMENT continued

A reminder of our business units
Printhead **Product Print Systems** **3D Printing**

Risk and link to business unit	Impact	Mitigation	Likelihood Magnitude Change
Operational continued			
Brexit	The United Kingdom's decision to leave the European Union presents both risk and opportunities to the Company. There is currently a prolonged period of uncertainty concerning EU workers, migration and trade leading up to the expected exit from the EU. Some of our current workforce have migrated from other countries in the EU and the continued recruitment of world class talent is critical to our success in a technical and specialised industry. Another challenge continues to be free trade into the EU. Around one third of our revenues are generated from EU countries and so any actual or perceived barriers to free trade are an obvious area of concern. We remain exposed to currency fluctuations that could result from the United Kingdom exiting the EU.	Key managers across the business are continuously monitoring the latest political developments and putting mitigating actions in place where there may be a potential impact on Xaar or its stakeholders. The majority of our currencies are naturally hedged. For those currencies where we generally do not carry a natural hedge, we carry minimal risk in the short term, with potential exposure for the long term where actions will need to be taken.	Probable Medium
Loss of manufacturing facility	We have manufacturing facilities in the UK and the US, and we rely on our strategic partners for key products and components for Xaar 1201, Xaar 5501 and Xaar 5601. If our manufacturing site or our partners' manufacturing sites were to experience an incident this could have operational and supply chain issues for the business.	Formal disaster recovery plans are maintained and reviewed. We are also able to use manufacturing partners to alleviate some operational issues. The Group's risk is spread by diversification in products and locations. Insurance coverage is regularly reviewed.	Remote High
Partnerships	Companies with whom we have alliances in certain areas (i.e. manufacturing/research) may already be or may become our competitors in other areas. In addition, companies with whom we have partnerships may also acquire or form alliances with our competitors, which could reduce their business with us. If we are unable to effectively manage these complicated relationships with alliance partners, our business and results of operations could be adversely affected.	The Director of IP and Legal focuses on the extensive review of legal agreements and in particular IP with such partners. Maintaining healthy partnerships is a key part of the role of our Chief Technical Officer. Partnerships are constantly reviewed both internally and with those partners at the most senior level.	Possible High
Inventory obsolescence	As the Group launches new products across its businesses, especially those sourced from suppliers under volume commitment arrangements rather than being manufactured in-house, it could end up stocking volumes in excess of near term demand. As a result, these products could be exposed to obsolescence and pricing risks.	The Group enters into volume commitments arrangements only where it is strategically important for its long term vision, taking into consideration the stage of market development for new products and minimum supply constraints. Where possible, the Group aligns supplier purchase commitments with customer sale commitments.	Possible High

Key of change

Increased No change Decreased

Risk and link to business unit	Impact	Mitigation	Likelihood Magnitude Change
Financial			
Ability to access sufficient capital	Our ability to access sufficient capital/liquidity may restrict growth opportunities for our organisation, as well as the strategic plan and vision. Whilst established product ranges are cash generative, significant investment is required to bring new products to market and ramp up to meaningful volumes.	The Group has implemented cost reduction measures to drive efficiencies and focus resources on key initiatives. In order to continue to fund our Thin Film activities and to realise the full potential value of our portfolio we are seeking strategic investment partners.	Possible Medium
Customer credit exposure	The Group may offer credit terms to its customers which at times could be extended beyond what is considered normal terms for products in early stages of its life cycle. The Group is at risk to the extent that a customer may be unable to pay the debt on time, thus impacting working capital.	This risk is mitigated by strong ongoing customer relationships, close monitoring of product launches by the customer in the market place and by credit insurance in certain jurisdictions.	Possible High
Volatility in exchange rates	Global economic events and uncertainty may cause currencies to fluctuate and currency volatility contributes to variations in our sales of products and services in impacted jurisdictions. The risk is that there could be significant adverse movements in currencies which cause a foreign exchange loss, reducing profit.	Our treasury policy allows us to hedge. There is a partial natural hedge for foreign currency movements. Cash flows are constantly reviewed and action is taken when appropriate.	Possible Medium

SUSTAINABLE AND RESPONSIBLE BUSINESS

Developing a sustainable business

The Group strongly believes that corporate responsibility is integral to business success. The Group is compliant with all relevant regulation and legislation whilst enhancing the working environment for our employees and minimising the environmental impact of our manufacturing processes. There is internal reporting of key metrics throughout the business, and each member of staff is expected to take individual responsibility for their performance and to work together to achieve shared goals.

Our community

Xaar sponsors two Imagineering Clubs at local primary schools. These Clubs are designed to introduce children to engineering through fun activities. The sponsorships are part of Xaar's role in helping to create the 'engineers of the future' and drive interest in STEM subjects (science, technology, engineering and mathematics) amongst school students.

Social responsibility

- Xaar employees raised money during the year for a number of charities, including taking part in various activities for Comic Relief on Red Nose Day, coffee mornings for Macmillan Cancer Support and Christmas Jumper Day for Save the Children.
- Xaar has sponsored a number of employees and their families engaging in events throughout the year, including charity golf days, equipment for a charity football team, various sporting events and donations to community food banks. In total, the Group made charitable contributions to local and national charities during the year totalling £5,100 (2017: £766). No political donations were made in the current or previous year.
- The social club, which is aimed at encouraging staff to have fun and get to know each other socially, held several events throughout the year including comedy nights, theatre trips, festivals, meals, nights at the races, family fun days and sports activities such as ice skating, charity races and cycling events.
- Xaar continues to sponsor an Imagineering Foundation club which operates at primary schools in both Huntingdon and Cambridge. Supported by eight volunteer tutors from Xaar's Operations and R&D teams, the weekly, hour-long after-school clubs are attended by up to 12 Year Six students. The students learn about basic science and engineering concepts and make working mechanical and electronics-based models, such as a balloon-powered 'rocket' car, a steady hand game and even an AM radio. The Foundation's aim is to introduce young people of 8-16 years to the exciting world of engineering, science and technology through fun, hands-on activities.

Human rights

The Group respects all human rights and in conducting its business the Group regards those rights relating to non-discrimination, fair treatment and respect for privacy to be the most relevant and to have the greatest potential impact on its key stakeholder groups of customers, employees and suppliers.

The Board has overall responsibility for ensuring that the Group upholds and promotes respect for human rights.
The Group seeks to anticipate, prevent and mitigate any potential negative human rights impacts as well as enhance positive impacts through its policies and procedures and, in particular, through its policies regarding employment, equality and diversity, treating customers fairly and information securely. Group policies seek both to ensure that employees comply with the relevant legislation and regulations in place in the UK and other operating locations and to promote good practice. The Group's policies are formulated and kept up to date by the relevant business area, authorised by the Board and communicated to all employees.

The Group undertakes extensive monitoring of the implementation of all of its policies and has not been made aware of any incident in which the organisation's activities have resulted in an abuse of human rights.

Equality and diversity

The Group is committed to providing a working environment in which employees feel valued and respected and are able to contribute to the success of the business. Employees are requested to co-operate with the Group's efforts to ensure that the policy is fully implemented.

The Group's aim is that its employees should be able to work in an environment free from discrimination, harassment and bullying, and that employees, job applicants, customers, retailers, business introducers and suppliers should be treated fairly regardless of:

- Race, colour, nationality (including citizenship), ethnic or national origins
- Gender, gender reassignment, sexual orientation, marital or civil partnership status
- Religious or political beliefs or affiliations
- Disability, impairment or age
- Real or suspected infection with HIV/AIDS
- Membership of a trade union
- Pregnancy, maternity and paternity.

and that they should not be disadvantaged by unjust or unfair conditions or requirements.

The Group aims to ensure that applications for employment from people with disabilities, and other under-represented groups, are given full and fair consideration and that such people are given the same training, development and job opportunities as other employees. Every effort is also made to retrain and support employees who suffer from disabilities during their employment, including the provision of flexible working to assist their re-entry into the workplace.

Human Resources policies are reviewed regularly to ensure that they are non-discriminatory and promote equality of opportunity. In particular, recruitment, selection, promotion, training and development policies and practices are monitored to ensure that all employees have the opportunity to train and develop according to their abilities.

The Group places considerable value on the involvement of its employees and has continued to keep them informed of the various factors affecting the performance of the Group. This is achieved through written communications shared through the Company intranet and email, and formal and informal meetings. All employees participate in a bonus scheme based on individual performance and Group business targets and, in the UK, have the opportunity to participate in an HMRC approved Share Save Scheme and Share Incentive Plan.

Based on the closing headcount at 31 December the split of staff by gender was as follows:

	31 December 2018 male/female	31 December 2017 male/female
All employees	**373/90**	454/116
Directors	**5/1**	5/2
Senior managers	**65/10**	80/13
Employees excluding Directors and senior managers	**303/79**	369/101

Formal directives and certification

The Group undertakes R&D and manufactures products in the UK and the USA. The Group complies with all local and European legislation. The Group's manufacturing facility in Huntingdon is both ISO 9001:2015 and ISO 14001:2015 certified. It is the Group's policy to maintain this level of certification for its Huntingdon manufacturing facilities and to comply at all times with all relevant environmental and other legislation in the territories in which the Group operates. The Group is compliant with REACH (Registration, Evaluation, Authorisation and restriction of Chemicals), WEEE (Waste Electrical and Electronic Equipment) and RoHS (Restriction of the Use of Certain Hazardous Substances) directives, as required under European legislation.

The Group has a proactive Health and Safety System modelled on OHSAS 18001/HSG65 in Cambridge, Huntingdon and Nottingham.

The anti-bribery and corruption policies of the Group are set out in the Corporate Governance section on page 51.

Health, safety and environment

Xaar has a manufacturing site in Huntingdon, along with R&D and head office functions in Cambridge, Nottingham, Europe and the USA, plus sales offices worldwide.

It is always Xaar's intention to conduct business in a manner that protects the public, the environment, and employee safety. Xaar's Environmental and Health & Safety policies provide a framework for setting and reviewing of Occupational Health, Safety and Environmental Objectives.

This demonstrates Xaar's continued commitment to the prevention of injury and ill health and also the continual improvement in our Environmental and Occupational Health & Safety Performance. Xaar believes that the combination of a safe place of work and safe working practices, together with a productive and innovative environment, are critical to the continued success of the Company.

The management of Xaar is committed to achieving and maintaining full compliance with appropriate environmental, health and safety legislation. Although certain responsibilities under this policy can be attributed to specific roles within the organisation, and in particular with different levels of management, each and every Xaar employee shares the basic core duty to understand their responsibilities to observe instructions put in place and, where necessary, to draw these to the attention of others.

To achieve our Environmental and Health & Safety commitments, Xaar will ensure that the organisation is led by example; systems are in place to engage, train, develop and maintain competent, informed personnel; resources are allocated to enable environmental health and safety standards to be maintained; employee involvement and open communications are actively encouraged; plant, equipment and facilities are safe and without risk to the health and welfare of all persons who could be affected by their use or maintenance; substances required and used in the workplace are handled and disposed of safely and in accordance to regulations; a comprehensive risk assessment programme is maintained covering all activities and processes, with control measures implemented to minimise risk where applicable; adequate welfare facilities are provided; where accidents or 'near misses' occur, they are reported, investigated and treated as the source of learning for ongoing working practices; and that best practice is shared across the Group.

The Group is committed to minimising its impact on the environment through the reduction and recycling of waste and by operating its facilities as efficiently as is practicable.

SUSTAINABLE AND RESPONSIBLE BUSINESS continued

Greenhouse gas emissions statement

Xaar plc has calculated its global greenhouse gas (GHG) emissions statement using an operational control consolidation approach as described in the Greenhouse Gas: Protocol: A Corporate Accounting and Reporting Standard (Revised Edition, 2004), which reflects the Defra Environmental Reporting Guidelines (Revised October 2013).

Scope 1 emissions

Scope 1 emissions occur from sources that are owned or where Xaar plc has operational control. This includes direct emissions from gas combustion in our buildings and fuel used in leased Company vehicles. Actual and estimated gas consumption data has been collected from each of the leased properties under the control of the Xaar Group, from data sources including direct meter readings, meter readings from suppliers included on invoices and estimations where required based on available information from property management suppliers and other sources. Actual mileage data has been collected from the leased Company vehicle fleet.

Scope 2 emissions

Scope 2 refers to indirect emissions from the consumption of purchased electricity (also including any purchased heat, steam or cooling) from facilities owned or under the operational control of Xaar plc. Actual and estimated data has been collected from each of the leased properties under the control of the Xaar Group, from data sources including direct meter readings, meter readings from suppliers included on invoices and estimations where required based on available information from property management suppliers and other sources.

Assessment parameters

Baseline year	1 January 2013 to 31 December 2013
Consolidation approach	Operational control
Boundary summary	All entities and all facilities under operational control included subject to the materiality threshold applied
Consistency with the financial statements	The only variation is that leased properties deemed to be under operational control have been included in scope 1 and 2 emissions
Materiality threshold	Materiality has been set at Group level at 5%*
Assessment methodology	Greenhouse Gas Protocol and ISO 14064-1 (2006)
Intensity ratio	Emissions per £m turnover excluding royalties

* The total of any excluded emission sources are estimated to be less than 5% of Xaar plc's total reported emissions.

	2018		2017	
GHG emission source	**(tCO_2e)**	**(tCO_2e/£m)**	(tCO_2e)	(tCO_2e/£m)
Scope 1	**125**	**2**	148	2
Scope 2	**3,128**	**60**	4,088	49
Statutory total (scope 1 and 2)	**3,253**	**62**	4,236	51

The GHG emissions statement includes emissions data from leased assets that are not included in the rest of the consolidated financial statements, other than in note 31 Operating lease arrangements.

BOARD APPROVAL OF THE STRATEGIC AND ANNUAL REPORTS

Board approval

The Strategic Report, Annual Report and Financial Statements, taken as a whole, are fair, balanced and understandable and provide the information necessary for shareholders to assess the Company's position, performance, business model and strategy.

Robin Williams
Chairman

Margaret Rice-Jones
Senior Independent Director

Doug Edwards
Chief Executive Officer

Andrew Herbert
Non-Executive Director

Shomit Kenkare
Chief Financial Officer

Chris Morgan
Non-Executive Director

GOVERNANCE

BOARD OF DIRECTORS

Diverse and capable leadership

Robin Williams
Chairman

Appointed: 2010 (Chairman: 2016)

Qualifications
- MA Engineering Science, Oxford University
- ACA, Peat Marwick Mitchell.

Experience
- Ten years as a corporate advisor
- Co-founder of Britton Group plc and grew the business to £250 million revenues within six years, before selling to a trade buyer
- Executive Director of Hepworth plc, with a leading role in the rationalisation and subsequent sale of the group
- Held various public and private company directorships across a range of industries including business services, healthcare, outsourcing, contracting, and manufacturing.

Current external appointments
- Chairman of Stirling Industries Plc, FIH Group Plc, and Keystone Law Plc
- Non-Executive Director of Van Elle Holdings Plc.

Committee membership

Doug Edwards
Chief Executive Officer

Appointed: 2015

Qualifications
- BSc Chemistry
- PhD in Conducting Organic Materials, London University.

Experience
- Responsible for Kodak packaging, functional printing, electrophotographic solutions, commercial and consumer Inkjet Systems with revenues of around $800 million. Prior to this Doug ran Kodak's largest Graphics business with revenues of $1.5 billion
- Vice President of Research and Product Development, New Business and Strategy Development at Kodak Polychrome Graphics (KPG), a 50/50 joint venture between Eastman Kodak Company and Sun Chemical Corporation
- Technical roles with Ilford Limited, ICI, Zenica Specialities and International Paper
- Scientific papers, patents and other publications to his name.

Committee membership

Shomit Kenkare
Chief Financial Officer

Appointed: November 2018

Qualifications
- Chartered Accountant
- Bachelor of Commerce.

Experience
- 20 years at Eastman Kodak Company, the NYSE-listed technology firm, where Shomit held a number of senior global financial and management roles
- Shomit's final nine years at Kodak were spent in the Commercial Printing industry, where his last role was CFO and VP of Finance for Kodak's Enterprise Inkjet, Software and Solutions, and Advanced Materials and Micro 3D Printing divisions
- Prior to Kodak, worked at Ernst & Young for their assurance practice.

Board dashboard

The Board has a balanced and diverse range of skills and experience. All Board appointments are made on merit, in the context of the diversity of skills, experience, background and gender required to be effective.

Board composition

1
3

Chairman: **1**
Executive Directors: **2**
Non-Executive Directors: **3**

Board tenure

1 1
4

0-2 years: **1**
3-4 years: **4**
5 years+: **1**

Key to Committees
A – Audit
R – Remuneration
N – Nomination
Chairman
Member

Andrew Herbert
Non-Executive Director

Appointed: 2016

Qualifications
- Chartered Management Accountant
- BA (Hons) in Business Studies.

Experience
- Extensive experience in the global digital printing industry following a 30-year career with Domino Printing Sciences plc, working both in the UK and the US
- Group Finance Director/Chief Financial Officer of Domino Printing Sciences plc from 1998 to 2015 during which time he played an instrumental role in expanding the business geographically through acquisition and creation of sales channels, and in broadening the product range via acquisition of technology based businesses
- Previously held a number of line director roles in Finance, Operations, Planning and Business Development.

Current external appointments
- Non-Executive Chairman of Midwich Group plc.

Committee membership

Margaret Rice-Jones
Senior Independent Director

Appointed: 2015

Qualifications
- BSc in Engineering, Durham University.

Experience
- Over 25 years' experience within innovative technology businesses
- Engineering background and has operated at Board level in various executive and non-executive roles for the last 15 years
- Margaret was CEO of Aircom International, a global software and services company, and Corporate Vice President of Motorola Inc.
- P&L responsibility for over $1 billion revenue and has worked with both business turnaround situations and high growth companies including Skyscanner where she was Chairman.

Current external appointments
- Chairman of Origami Energy Ltd
- Non-Executive Director of Holiday Extras Ltd.

Committee membership

Chris Morgan
Non-Executive Director

Appointed: 2016

Experience
- Wealth of expertise in managing complex international technology businesses, having spent 25 years at HP Inc.
- Strong background in global marketing, sales and general management senior executive roles including global accountability for HP's multibillion dollar graphics/industrial portfolio of digital 2D and 3D printing businesses from 2009-2012
- Extensive experience in Asia and Japan having spent more than a decade in senior APJ leadership roles
- Led strategic investments in key growth markets and has been involved in a number of mergers and acquisitions at both the strategic and operational levels
- Chief Marketing Officer for Stratasys in 2014-2015 and recently served as Senior Vice President of Americas and Asia for 3D Systems, Inc. until January 2018.

Committee membership

Gender diversity

Female: **1**
Male: **5**

1

5

Skills and experience
- Inkjet printing
- Political
- Regulatory
- Financial
- International
- Operations
- Current/Recent Chair

BOARD OF DIRECTORS continued

Board structure

Board of Directors

Management Committee

Principal Committees

Audit Committee
The Audit Committee is responsible for monitoring and reviewing the integrity of the financial reporting process, including the appropriateness and effectiveness of the Internal Controls and Risk Management procedures of the Group.

Andrew Herbert
Chairman
...see pages 52 to 53

Nomination Committee
The Nomination Committee is responsible for reviewing the size, structure and composition of the Board and providing advice to the Board on Board and senior management appointments and succession planning; monitoring of the composition of the Board and its Committees.

Robin Williams
Chairman
...see page 54

Remuneration Committee
The Remuneration Committee is responsible for the development and implementation of the Group's remuneration framework and policies for Directors including all incentives and bonuses.

Margaret Rice-Jones
Chairman
...see page 55

DIRECTORS' REPORT

Report on the affairs of the Group

The Directors present their Annual Report on the affairs of the Group together with the financial statements and auditor's report for the year ended 31 December 2018. The Corporate Governance statement set out on pages 47 to 51 forms part of this report.

An indication of likely future developments in the business of the Company and details of research and development activities are included in the Strategic Report. The Group's policies relating to equality, diversity and employee consultation can be found in the 'Sustainable and responsible business' section of the Strategic Report on page 35.

Details on dividends are set out on page 27.

The Greenhouse gas emissions statement can be found on page 36.

Capital structure

Details of the issued share capital, together with details of the movements in the Company's issued share capital during the year, are shown in note 25. The Company has one class of ordinary shares which carries no right to fixed income. Each share carries the right to one vote at general meetings of the Company, except for shares held in the Xaar Share Incentive Plan trust.

There are no specific restrictions on the size of a holding nor on the transfer of shares, which are both governed by the general provisions of the Articles of Association and prevailing legislation. The Directors are not aware of any agreements between holders of the Company's shares that may result in restrictions on the transfer of securities or on voting rights.

Details of employee share schemes are set out in note 32.

No person has any special rights of control over the Company's share capital and all issued shares are fully paid.

With regard to the appointment and replacement of Directors, the Company is governed by its Articles of Association, the UK Corporate Governance Code, the Companies Act and related legislation. The Articles themselves may be amended by Special Resolution of the shareholders. The powers of Directors are described in the Main Board terms of reference, copies of which are available on request, and the Corporate Governance statement on pages 47 to 51.

Treasury

The Group's policy enables it to use financial instruments to hedge foreign currency exposures. The main trading currency of the Group is the Pound Sterling. The Group's use of financial instruments and the related risks are discussed further in notes 19, 20 and 23.

At the 2018 AGM held on 22 May 2018, the Company's shareholders granted the Company authority to make one or more market purchases (within the meaning of section 693(4) of the Companies Act 2006) of ordinary shares of 10 pence each in the capital of the Company.

The Company did not purchase any shares for cancellation or to be held as treasury in 2017 or 2018.

Directors and their interests

The Directors who served during the year, and subsequent to the year-end, unless otherwise stated, were as follows:

Robin Williams – Chairman

Doug Edwards – Chief Executive Officer

Shomit Kenkare – Chief Financial Officer (appointed on 15 November 2018)

Margaret Rice-Jones – Senior Independent Director

Chris Morgan – Non-Executive Director

Andrew Herbert – Non-Executive Director

Lily Liu – Chief Financial Officer and Company Secretary (resigned on 14 November 2018)

Ted Wiggans – Chief Operations Officer (stepped down from the Board on 31 March 2018, retired from the Company on 9 August 2018)

Brief biographical descriptions of the Directors are set out on pages 38 and 39. Full details of their interests in shares of the Company and its subsidiary undertakings are included in the Directors' Remuneration report on page 61.

DIRECTORS' REPORT continued

Report on the affairs of the Group continued

Shareholdings in the Company

The interests of the Directors in the shares of the Company and its subsidiaries (all of which are beneficial) as at 31 December 2018 are as follows:

	Number of ordinary shares of 10p each 31 December 2018	Number of ordinary shares of 10p each 31 December 2017
Doug Edwards	**33,885**	33,885
Shomit Kenkare	**–**	–
Robin Williams	**10,000**	10,000
Margaret Rice-Jones	**5,700**	5,700
Chris Morgan	**–**	–
Andrew Herbert	**–**	–

There have been no changes in the Directors' interests in shares of the Company between 31 December 2018 and 21 March 2019. Directors' interests in options over shares in the Company are shown in the Directors' Remuneration report.

Directors' liabilities

The Company has granted an indemnity to all of its Directors against liability in respect of any potential proceedings that may be brought by third parties, subject to the conditions set out in the Companies Act 2006. Such qualifying third party indemnity provision remains in force as at the date of approving the Directors' report.

Share capital

As at 31 December 2018 the Company had been notified in accordance with Chapter 5 of the Financial Conduct Authority's (FCA's) Disclosure and Transparency Rules of the following material interests in its share capital:

	Number of ordinary shares held	Percentage of issued share capital
AXA Investment Managers	**11,127,769**	14.21%
M&G Investment Management	**8,389,013**	10.71%
Legal & General Investment Management	**7,060,106**	9.01%
T Rowe Price International	**6,435,282**	8.22%
Artemis Investment Management	**5,445,589**	6.95%
Oppenheimer Funds	**4,000,000**	5.11%
Baillie Gifford	**3,924,051**	5.01%
Schroder Investment Management	**3,494,410**	4.46%
Majedie Asset Management	**3,175,748**	4.05%

During the period 31 December 2018 to 21 March 2019, the Company did not receive any notifications pursuant to chapter five of the FCA's Disclosure and Transparency Rules.

Annual General Meeting

The notice convening the Annual General Meeting is set out on pages 133 to 136. Resolutions 1 to 10 set out in the notice of the meeting deal with the ordinary business to be transacted at the meeting. The special business to be transacted at the meeting is set out in Resolutions 11 to 14.

Re-election of Directors
Resolutions 4 to 9

The Company's Articles of Association require the Directors to retire by rotation at least once every three years, with the number to retire by rotation at each Annual General Meeting being the number nearest to but not exceeding one third of the Board. However, the UK Corporate Governance Code provides that all Directors should be subject to re-election by their shareholders every year. In accordance with this provision of the UK Corporate Governance Code and in keeping with the Board's aim of following best corporate governance practice, the Board has decided that, as at recent Annual General Meetings of the Company, all Directors should retire at each Annual General Meeting and offer themselves for re-election.

Directors' Remuneration report
Resolution 10

This Resolution seeks shareholder approval for the Directors' Remuneration report, which includes the remuneration policy. The Directors' Remuneration report can be found on pages 56 to 76 (inclusive) of the Annual Report and Financial Statements.

In accordance with regulations which came into force on 1 October 2013, Resolution 10 offers shareholders an advisory vote on the implementation of the Company's existing remuneration policy.

Electronic communication with shareholders
Resolution 11

This resolution seeks shareholder approval for the Company, in an effort to improve efficiency and achieve cost savings where possible, to communicate with the shareholders electronically, including by means of its website. If the Resolution is approved, the Company will contact all shareholders to obtain their individual consent to receive electronic communications. Shareholders will each be given the opportunity to elect to continue receiving hard copy communications if that is their preference.

Authority to purchase own shares
Resolution 12

It is proposed by Resolution 12, by Special Resolution, to authorise the Company generally and unconditionally to purchase its own shares at a price of not less than the par value of the shares and not more than the higher of:

(i) 5% above the average of the middle market quotations of the shares as derived from the London Stock Exchange Daily Official List for the five dealing days immediately preceding the day on which the purchase is made; and
(ii) the amount stipulated by article 5(1) of the Buy-back and Stabilisation Regulation 2003 (in each case exclusive of any expenses payable by the Company).

The authority will be for a maximum of 14.9% of the Company's issued share capital and will expire at the earlier of the next Annual General Meeting of the Company or within 15 months from the date of the passing of this Resolution. The Directors currently have no intention to exercise the authority and will only purchase shares if it is in the best interests of shareholders as a whole.

The total number of ordinary shares under option, which remain unexercised and outstanding as at 21 March 2019 (including options awarded under LTIP which may be satisfied by subscription for new shares) was 3,394,588. This represents 4% of the issued ordinary share capital at that date. If the Company was to buy back the maximum number of ordinary shares permitted pursuant to the passing of this Resolution, then the total number of ordinary shares under option which remain unexercised and outstanding as at 31 December 2018 would represent 5% of the reduced issued ordinary share capital.

Power to issue securities
Resolution 13

Under the Companies Act 2006 the Directors of the Company may only allot shares (whether for cash or otherwise) with the authority of shareholders given at a general meeting of the Company. In accordance with institutional guidelines, under Resolution 13, to be proposed as an Ordinary Resolution, authority is sought to allot shares:

(i) in relation to a pre-emptive rights issue only, up to an aggregate nominal amount of £5,222,286.40, which represented two thirds of the Company's ordinary share capital as at 21 March 2019; and
(ii) in any other case, up to an aggregate nominal amount of £2,611,143.20, which represented one third of the Company's ordinary share capital as at 21 March 2019.

The Directors do not currently have an intention to exercise the authority.

DIRECTORS' REPORT continued

Report on the affairs of the Group continued

Resolution 14
This Resolution, to be proposed as a Special Resolution, will give the Directors power to allot shares:

(i) up to an aggregate nominal amount of £5,222,286.40 (representing approximately 66% of the Company's issued share capital) on an offer to existing shareholders on a pre-emptive basis (subject to any adjustments, such as for fractional entitlements and overseas shareholders, as the Directors see fit); and
(ii) for cash up to a maximum aggregate nominal value of £783,342.90, representing 10% of the ordinary share capital of the Company as at 21 March 2019, otherwise than in connection with an offer to existing shareholders.

In previous years, the Directors have sought, and been granted, power to allot equity securities for cash free from pre-emption rights (otherwise than in connection with a rights issue or similar pre-emptive issue) up to a maximum nominal amount representing approximately 5% of the Company's issued ordinary share capital. Such power has given the Directors the ability to allot equity securities for cash non pre-emptively in any circumstances. The limitation of the disapplication power to a maximum of 5% of the Company's issued ordinary share capital accorded with best practice as set out in The Pre-Emption Group's Statement of Principles on the Disapplication of Pre-Emption Rights (July 2008).

In March 2015, The Pre-Emption Group published a revision of its Statement of Principles. In addition to restating the existing 5% disapplication limit, the 2015 Statement of Principles introduced greater flexibility for companies to undertake non pre-emptive issues for cash in connection with acquisitions and specified capital investments. This relaxation is intended to allow companies the opportunity to finance expansion opportunities as and when they arise.

Accordingly, the 2015 Statement of Principles provides that a company may now seek power to issue on a non-pre-emptive basis for cash equity securities representing (i) no more than 5% of the Company's issued ordinary share capital in any one year; and (ii) no more than an additional 5% of the Company's issued ordinary share capital provided that such additional power is only used in connection with an acquisition or specified capital investment.

Accordingly, in line with the 2015 Statement of Principles (which have been endorsed by The Investment Association), the Directors are seeking power to allot equity securities for cash (otherwise than in connection with a rights issue or similar pre-emptive issue) up to a maximum nominal amount of £783,342.90, representing approximately 10% of the Company's issued ordinary share capital as at 21 March 2019 (being the latest practicable date prior to publication of this document). Whilst the Directors may use up to one half of this amount to issue equity securities for cash non pre-emptively in any circumstances, they confirm that they would only use the other half in connection with an acquisition or a specified capital investment which is announced contemporaneously with the issue, or which has taken place in the preceding six-month period and is disclosed in the announcement of the issue.

The Directors also confirm their intention to adhere to the provisions of the 2015 Statement of Principles regarding cumulative use of authorities within a rolling three year period. Those Principles provide that equity securities should not be allotted for cash on a non-pre-emptive basis (other than pursuant to a rights issue or pre-emptive offer) in excess of an amount equal to 7.5% of the total issued ordinary share capital of the Company in any rolling three year period, without prior consultation with the Company's shareholders. This limit excludes any equity securities issued pursuant to a specific disapplication of pre-emption rights and any equity securities issued pursuant to a general disapplication of pre-emption rights in connection with an acquisition or specified capital investment.

The Directors do not currently have an intention to exercise any power given to them by shareholders to allot shares for cash on a non-pre-emptive basis.

The authorities contained in Resolutions 13 and 14 will expire no later than 15 months after the passing of those Resolutions.

Additional information for shareholders

The following provides the additional information required for shareholders as a result of the implementation of the Takeovers Directive into UK law.

The structure of the Company's issued share capital is shown in note 25.

Details of ordinary shares held in trust owned by the Company can be found in note 27.

The Company is not aware of any agreements between shareholders that may result in restrictions on the transfer of securities and/or voting rights.

The Directors are authorised to issue and allot shares and to undertake purchases of the Company's shares. Appropriate resolutions to renew these authorities are proposed to be passed at the Annual General Meeting as detailed above and notice of which is on pages 133 to 136.

Ordinary shares

On a show of hands at a general meeting of the Company every holder of ordinary shares present in person and entitled to vote shall have one vote for every ordinary share held and, on a poll, every member present in person or by proxy and entitled to vote shall have one vote for every ordinary share held. The notice of the Annual General Meeting on pages 133 to 136 specifies deadlines for exercising voting rights either by proxy notice or present in person or by proxy in relation to resolutions to be passed at the Annual General Meeting. All proxy votes are counted and the numbers for, against or withheld in relation to each resolution are made available at the Annual General Meeting and are published on the Company's website after the meeting. No person holds securities carrying special rights with regard to control of the Company.

Restrictions

There are no restrictions on the transfer of ordinary shares in the Company other than:

- certain restrictions may from time to time be imposed by laws and regulations (for example, insider trading laws and market requirements relating to close periods); and
- pursuant to the Listing Rules of the FCA whereby all employees of the Company require the approval of the Company to deal in the Company's securities.

The Company's Articles of Association may only be amended by a Special Resolution at a general meeting of the shareholders. Directors are reappointed by Ordinary Resolution at a general meeting of the shareholders.

Action to be taken

As detailed in the notes to the notice convening the Annual General Meeting, you will not receive a Form of Proxy for the Annual General Meeting in the post. Instead, you can vote online at www.signalshares.com. To register, you will need your Investor Code, which can be found on your share certificate, once logged on, click on the "Vote Online Now" button to vote. Proxy votes should be submitted as early as possible and in any event, no later than 48 hours before the start of the meeting (excluding weekends and public holidays). Submission of a proxy vote will not preclude you from attending the Annual General Meeting and voting in person should you subsequently find that you are able to be present. You may request a hard copy proxy form directly from the registrars, Link Asset Services on 0871 664 0300. (Calls cost 12p per minute plus your phone company's access charge. If you are outside the United Kingdom, please call +44 371 664 0300. Calls outside the United Kingdom will be charged at the applicable international rate). Lines are open between 9.00a.m. – 5.30p.m., Monday to Friday, excluding public holidays in England and Wales.

Appointment of Directors

The Board can appoint a Director but anyone so appointed must be elected by an Ordinary Resolution at the next general meeting. All Directors are required to submit themselves for reappointment every year at the AGM.

Significant interests

Directors' interests in the share capital of the Company are shown in the table on page 42. Major interests (i.e. those greater than 3%) of which the Company has been notified are shown on page 42.

Company share schemes

The Xaar plc ESOP Trust holds 1.4% of the issued share capital of the Company in trust for the benefit of employees of the Group and their dependants. The voting rights in relation to these shares are exercised by the Trustees.

Change of control

The Company is not party to any agreements which take effect, alter or terminate upon a change of control of the Company following a takeover bid. There are no agreements between the Company and its Directors or employees providing for compensation for loss of office or employment (whether through resignation, purported redundancy or otherwise) that occurs because of a takeover bid. Depending on the achievement of performance conditions, share-based payment arrangements may vest on change of control but this is subject to the approval and exercise of the discretion of the Remuneration Committee.

Going concern

The Group's business activities, together with the factors likely to affect its future development, performance and position are set out in the Strategic Report on pages 6 to 19. Notes 19, 20 and 23 include a description of the Group's objectives, policies and processes for managing its capital; its financial risk management objectives; details of its financial instruments and hedging activities; and its exposure to credit risk and liquidity risk.

After making enquiries, the Directors have a reasonable expectation that the Group has adequate resources to continue in operational existence for the foreseeable future, based on the Group's forecasts and projections for the next 12 months, taking account of reasonably possible changes in trading performance. For this reason, we continue to adopt the going concern basis in preparing the financial statements.

Report on the affairs of the Group continued

Viability statement

The long term viability of the Company is assessed by the Directors as part of the risk management process and regular strategic reviews. As well as continually monitoring and managing risk, the Directors lead a comprehensive review of the principal risks to the Company at least annually. This review, which considers inputs from key individuals from all areas of the business, was last performed in February 2019. The Company's strategy is regularly discussed by the Board and is biannually subject to a full review.

The Directors' assessment of the Company's viability has been made with reference to the strategic planning documented on pages 6 to 19. The Company's strategic plans are based on the three business unit structure which underpin the Company's long term vision. Strategic plans for the whole Company and each of the businesses are updated taking into consideration assumptions concerning existing and future products and technology, customer engagements, business relationships, partnership opportunities and the commercial, technological and macro-economic risks. The strategic plan for the Company is approved by the Board and performance is tracked against this plan.

The Company is aware that it operates in an uncertain environment and faces risks both internally and externally that could potentially impact on the Company's ability to achieve its strategy. The principal risks and uncertainties faced by the Company are included on pages 29 to 33. As part of the process of reviewing these risks, and other potential risks, the Board assigns responsibility for these to the Executive Directors. It is the responsibility of the Executive Directors to manage the risk and the mitigating actions. This process is supplemented with strong internal controls and processes. This combination ensures that the Company manages the risks it faces appropriately and that these are considered in all of the financial models.

The Company's cash generation has been affected by the decline in mainly Ceramic Bulk printhead revenues and delays in new Thin Film product commercialisation and adoption. There is a risk that the Company may not therefore be able to fund the investment in Thin Film and 3D so as to optimise returns to shareholders in these two technology development areas. Significant action has been taken in cost reduction, a new sales approach has been established in printheads, plans have been put in place to reduce working capital, options are being explored to monetise our technology through licensing income and now as a result of strategic review through seeking partners in our Thin Film programme, but the results of these programmes will not be known for several months.

Taking account of the Company's current financial position, operating performance, and the principal risks and uncertainties, the Directors have assessed the prospects of the Company, and subject to the comments above, confirm that they have a reasonable expectation that the Company will be able to continue in operation and meet its liabilities as they fall due for the next three years, to December 2021.

Auditor

Deloitte LLP have expressed their willingness to continue in office as auditor and a resolution to reappoint them will be proposed at the forthcoming AGM.

Directors' statement as to disclosure of information to auditor

The Directors who were members of the Board at the time of approving the Directors' report are listed on page 41.

Having made enquiries of fellow Directors, each of these Directors confirm that:

- To the best of each Director's knowledge and belief, there is no information relevant to the preparation of their report of which the Group's auditor is unaware
- Each Director has taken all the steps a Director might reasonably be expected to have taken to be aware of relevant audit information and to establish that the Group's auditor is aware of that information.

This confirmation is given and should be interpreted in accordance with the provisions of section 418 of the Companies Act 2006.

Approval

The Directors' report was approved by the Board on 21 March 2019 and is signed on its behalf by:

Shomit Kenkare
Chief Financial Officer

GOVERNANCE

Corporate Governance statement

During 2018, the Company was committed to the principles of corporate governance contained in the 2016 UK Corporate Governance Code which was issued in April 2016 by the Financial Reporting Council ('the Code') for which the Board is accountable to shareholders.

From 1 January 2019 the Company has committed to the principles of corporate governance contained in the 2018 UK Corporate Governance Code ("the 2018 Code") which was issued in July 2018 by the Financial Reporting Council, effective 1 January 2019. The 2018 Code is an updated set of Principles and Provisions that emphasise the value of good corporate governance to long-term sustainable success and achievement of wider objectives. Further information on work performed to implement the 2018 Code is included on page 50.

The governance report gives:

- A clear and honest view of progress throughout the year
- The outcome of our Board evaluation
- Disclosure of Board discussions and the resulting actions
- Our approach to ensuring long-term viability of the business
- Our approach to risk and mitigation.

Application of the main principles of the Code

The Company has applied the principles of the Code, including both the Main Principles and the supporting principles. An explanation of how the Main Principles have been applied during 2018 is set out below.

A. Leadership

A1. The Board's role

The Board is responsible for the formulation of strategy; the monitoring of financial and non-financial performance and the approval of major transactions; financial statements; other formal communications with shareholders; and operating and capital expenditure budgets.

Comprehensive Board papers dealing with all aspects of the business are distributed by the Company Secretary typically one week in advance of each Board meeting.

The Board met ten times during the year.

A2. A clear division of responsibilities

There exists a clear division of responsibilities between the Chairman and the Chief Executive. The Chairman's primary role includes ensuring the Board functions properly, that it meets its obligations and responsibilities, and that its organisation and mechanisms are in place and are working effectively.

The Chief Executive's primary role is to provide overall leadership and vision in developing, with the Board, the strategic direction of the Company. Additionally, the Chief Executive is responsible for the management of the overall business to ensure that strategic and business plans are effectively implemented, the results are monitored and reported to the Board, and financial and operational objectives are attained.

The Board delegates management of the business to the Executive Committee, headed by the Chief Executive Officer. The Executive Committee meets weekly and is responsible for implementing Group strategy, monitoring business performance, preparing the operating and capital expenditure budgets for recommendation to the Board, and ensuring efficient management of the Group.

A3. Role of the Chairman

The Chairman sets the agendas for Board meetings, manages the meetings (in conjunction with the Company Secretary) and facilitates open and constructive dialogue during them.

A4. Role of the Non-Executive Directors

The Non-Executive Directors attend the Board meetings, and form the Audit, Remuneration and Nomination Committees. They are responsible for scrutinising the performance of management and determining appropriate levels of remuneration of Executive Directors. They also have a key role in appointing and, where required, removing Executive Directors.

GOVERNANCE continued

Corporate Governance statement continued

B. Effectiveness

B1. The Board's composition
The Nomination Committee is responsible for regularly reviewing the composition of the Board. In recommending appointments to the Board, the Nomination Committee considers the range of skills, knowledge and experience required, taking into account the benefits of diversity on the Board, including gender.

The Board of Directors comprises the Chairman, two Executive Directors and three Non-Executive Directors.

The Board considers Margaret Rice-Jones, Chris Morgan and Andrew Herbert to be independent within the meaning of the Code. To be considered independent each Non-Executive Director is sufficiently separate to management and free from any business or other relationships which could affect their judgement, impartiality or objectivity.

B2. Board appointments
The appointment of new Directors is led by the Nomination Committee. Further details of the activities of the Nomination Committee can be found on page 54.

B3. Time commitments
On appointment, Directors are notified of the time commitment expected from them. External directorships, which may affect existing time commitments, must be agreed with the Chairman in advance.

B4. Induction, training and development
When new Directors are appointed, they receive a complete and specially bespoke induction and training programme aimed at introducing and familiarising them to the management team, the Group's activities and processes, and to give them the knowledge required to effectively execute their role.

B5. Provision of information and support
The Chairman, in conjunction with the Company Secretary, ensures that all Board members receive accurate and timely information.

B6. Board and committee performance evaluation
The Board's policy for individual Director performance review is for a formal and rigorous appraisal process based on performance by the individual Director against specific targets. Individual Director performance is reviewed at least annually. The Senior Independent Director, in consultation with the other Non-Executive Directors and taking into account the views of the other Directors, appraises the performance of the Chairman. The Executive Directors, in consultation with the Chairman, appraise the performance of the Non-Executive Directors.

The Board reviewed both its own performance and the performance of the Board committees once during the year through a questionnaire issued to all members of the Board. The results were reviewed by the Board as a whole and it was concluded that individual Board members are satisfied that the Board works well and operates effectively in an environment where there is constructive challenge from the Non-Executive Directors. They are also satisfied with the contribution made by their colleagues and that Board committees operate properly and effectively. It is the Board's intention to review its own performance, and that of its committees, at least once a year.

B7. Re-election of Directors
All Directors were subject to shareholder election or re-election at the 2018 AGM, as will be the case at the 2019 AGM.

C. Accountability

C1. Financial and business reporting

The Board has established arrangements to ensure that reports and other information published by the Group are fair, balanced and understandable. The Strategic Report, set out on pages 1 to 37, provides information about the performance of the Group, the business model, the Group's strategy and the risks and uncertainties relating to the Group's future prospects.

C3. Role and responsibilities of the Audit Committee

The role and responsibilities of the Audit Committee are set out in the Audit Committee section on pages 52 to 53.

C2. Risk management and internal control systems

The Group's policies relating to risk management and internal control can be found in the 'Risk management' section of the Strategic Report on pages 29 to 33.

The Committee has formally identified the Chief Operating Officer as responsible for health and safety and the Chief Financial Officer as Director responsible for risk assessment.

D. Remuneration

D1. Levels and elements of remuneration

The Remuneration Committee sets levels of remuneration which are designed to promote the long term success of the Group and structures remuneration so as to link it to both corporate and individual performance, thereby aligning management's interests with those of shareholders.

D2. Development of remuneration policy

Details of the activities of the Remuneration Committee can be found in the Remuneration Committee section on page 55 and in the Directors' Remuneration report on pages 56 to 76.

E. Relations with shareholders

E1. Shareholder engagement and dialogue

The Directors seek to build on a mutual understanding of objectives between the Group and its institutional shareholders by meeting at least twice per year, following interim and annual results, to provide an update on trading and obtain feedback. Additionally, the Group has hosted institutional investors at its Cambridge, Huntingdon and Nottingham offices during the year.

The Group's financial public relations advisors and lead brokers give all investors and potential investors who have met with the Group's investor relations team, the opportunity to provide feedback on the meetings. Additionally, the Chief Executive Officer and the Chief Financial Officer provide feedback to the Board at the meeting following shareholder meetings to ensure that the Board, and in particular the Non-Executive Directors, possess an understanding of the views of the Company's major shareholders. Both the Chairman and the Senior Independent Director are available to meet with shareholders as required.

Shareholders can access up-to-date Company information from the Investors section of the Xaar website at www.xaar.com.

E2. Constructive use of the AGM

The Board uses the AGM to communicate with investors and to encourage their participation.

GOVERNANCE continued

Corporate Governance statement continued

2018 UK Corporate Governance Code

The Board has considered and implemented the provisions of the 2018 Code effective 1 January 2019. The Terms of Reference for the Audit, Nomination and Remuneration Committees have been updated to reflect the changes in the 2018 Code, with the Committees addressing additional requirements of them. The Board has formally introduced workforce engagement sessions to be held at least three times a year, the first sessions taking place in December 2018.

Chairman tenure

Robin Williams has served as Chairman for two years and five months, having previously been a Non-Executive Director of Xaar since 2010. The Board notes the guidance from the recent revisions to the Governance code. Especially in the light of the strategic review his length of tenure as Chairman will be determined by the succession cycle of the Executive Board, but in light of his length of service on the Board, he would not expect to serve more than two three year terms of appointment as Chairman. Mr Williams has provided assurance to the Board that he has more than adequate time to devote to his role at Xaar.

Summary of Board meeting attendance in 2018

Ten Board meetings were held in 2018.

Name	Meetings attended
Doug Edwards	10 (10)
Shomit Kenkare*	2 (2)
Robin Williams	10 (10)
Margaret Rice-Jones	10 (10)
Andrew Herbert	10 (10)
Chris Morgan	10 (10)
Lily Liu**	8 (8)
Ted Wiggans***	2 (2)

* Shomit Kenkare joined the Board on 15 November as Chief Financial Officer.
** Lily Liu resigned as Chief Financial Officer on 14 November 2018.
*** Ted Wiggans stepped down from the Board on 31 March 2018.

Figures in brackets denote the maximum number of meetings that could have been attended.

Board committees

Summary of committee membership:

Name	Audit Committee	Remuneration Committee	Nomination Committee
Robin Williams	Yes*	Yes	Chairman
Margaret Rice-Jones	Yes	Chairman	Yes
Chris Morgan	Yes	Yes	Yes
Andrew Herbert	Chairman	Yes	Yes
Doug Edwards	No	No	Yes

* From 1 January 2019, Robin Williams, Chairman, is no longer a member of the Audit Committee in line with the UK Corporate Governance Code.

Summary of committee meeting attendance in 2018:

Name	Audit Committee	Remuneration Committee	Nomination Committee
Number of meetings held	4	6	5
Robin Williams	4 (4)	6 (6)	5 (5)
Margaret Rice-Jones	4 (4)	6 (6)	5 (5)
Chris Morgan	4 (4)	6 (6)	5 (5)
Andrew Herbert	4 (4)	6 (6)	5 (5)
Doug Edwards	N/A	N/A	5 (5)

Figures in brackets denote the maximum number of meetings that could have been attended.

Conflicts of interest
Following the changes made to the Company's Articles of Association to incorporate the provisions of section 175 of the Companies Act 2006 which gave boards the statutory power to authorise conflicts of interest, any potential conflict of interest is approved by the Board in advance of any action or appointment that could result in a conflict of interest arising. Each member of the Board is familiar with the procedure to follow in relation to conflicts of interest and the process is operated efficiently.

Group structure
The Group has three main locations. The head office functions, R&D, EMEA sales, marketing, human resources, finance, IT and facilities are based in Cambridge, UK. The Group has two manufacturing facilities: one in Huntingdon, UK, and the other in Vermont, USA. The Group also has representatives in other global locations including India, Hong Kong, Sweden and Denmark.

Refer to page 6 for the Xaar business model.

Whistle-blowing, and anti-bribery and corruption policies
The Company conducts its business with the highest standards of integrity and honesty at all times and expects its employees to maintain the same standards in everything they do. Employees are therefore required to report any wrongdoing by Xaar or its members of staff that falls short of these principles. The whistle-blowing, and anti-bribery and corruption policies are available and communicated to all employees via the Company intranet, and all employees confirm in writing that they have read and comply with the whistle-blowing and anti-bribery and corruption policies. All reported incidences of actual or suspected bribery or corruption will be promptly and thoroughly investigated and dealt with appropriately by the Board. The purpose of the anti-bribery and corruption policy is to protect Xaar and its employees from breaches of anti-bribery and corruption laws. Xaar does not tolerate any employee or third party being involved in any level of bribery or corruption. Xaar is committed to complying with applicable anti-bribery and corruption laws in all countries in which it conducts business.

Statement of compliance with the Code
Throughout the year ended 31 December 2018 the Company has followed the provisions set out in the Code, and have implemented the provisions of the 2018 Code from 1 January 2019 or earlier.

The Board confirms the 2018 Annual Report and Financial Statements, taken as a whole, is fair, balanced and understandable, and provides the information necessary for shareholders to assess the position, performance, strategy, and business model of the Company.

Approval
The Corporate Governance statement was approved by the Board on 21 March 2019 and is signed on its behalf by:

Shomit Kenkare
Chief Financial Officer

GOVERNANCE continued

Audit Committee

Andrew Herbert
Chairman of the Audit Committee

The Audit Committee (the 'Committee') is appointed by the Board from the Non-Executive Directors of the Company.

The Chairman of the Committee, Andrew Herbert, is deemed by the Board to have recent and relevant financial experience as he was, until 2015, CFO of FTSE listed Domino Printing Sciences plc and is a Fellow of the Institute of Chartered Management Accountants.

The Committee's terms of reference were revised and updated in January 2019 and include all matters indicated by Disclosure and Transparency Rule 7.1 and the 2018 UK Corporate Governance Code. The written terms of reference of the Committee are available on request from the Company Secretary.

Please see the tables on page 50 for details of the Committee members in the year and the number of Committee meetings attended. The Committee meetings are also attended, by invitation, by the Group Chief Executive Officer, the Chief Financial Officer and other senior financial management as appropriate. The external auditor also attends specific parts of the meeting including separate sessions with Committee members only.

Report from the Committee Chairman

I am pleased to present the Audit Committee's report describing our work during the past year. Deloitte LLP was reappointed as the Company's auditor at the Annual General Meeting and Paul Schofield has continued as engagement partner.

The Audit Committee's primary responsibilities are:

- To approve and monitor key financial and accounting policies and practices
- To monitor the integrity of the financial statements, announcements and review significant financial reporting judgements contained therein
- To keep under review the adequacy and effectiveness of internal controls
- To review procedures, systems and controls for whistle-blowing, fraud detection and bribery prevention
- To review, approve and monitor internal audit activities
- To monitor and review the Group's external auditor's independence, objectivity and effectiveness
- To make recommendations to the Board on the appointment, remuneration and terms of engagement of the external auditor.

The Committee is not responsible for the identification of key risks or the review of the adequacy of arrangements to mitigate those risks, which remains the responsibility of the main Board.

The Committee is required to report its findings to the Board at least annually, identifying any matters on which it considers that action or improvement is needed, to make recommendations on the steps to be taken, and to ensure that the required actions are taken.

Significant issues considered by the Committee

The Committee has a work plan that is designed to ensure its responsibilities are fully discharged over the annual reporting cycle. Specific items are added to the agenda for individual meetings as required. Significant accounting matters considered during the year include revenue recognition, the adequacy and appropriateness of certain provisions including the recoverability of trade receivables, inventory valuation, capitalisation of development costs under IAS 38 and impairment review of the P4 intangible asset. Other areas considered include various control and compliance matters. During the year the Committee has reviewed the potential impact of the UK exiting the EU on the business.

Key areas of management judgement

The trading results of the Group in 2018 were significantly below expectation for the year leading to a pre-tax loss and extended ageing of certain working capital balances. The Committee has reviewed and challenged management judgement in respect of recovery of overdue receivables and slow moving inventories, gaining assurance that the basis of provisions made, against non-recovery and ultimate sales value respectively, is reasonable and reflects appropriate balance between the commercial position and financial prudence. The Committee has similarly reviewed and challenged the value of intangible assets associated with the P4 Thin Film platform and, while noting the slower than anticipated commercialisation of the Xaar 5601 Thin Film product, is satisfied that present delays have not led to impairment of the carrying value.

Key activities

In discharging its responsibilities the Committee has completed the following activities:

Financial statements and reports

- Reviewed the Annual Report and Financial Statements and the half-yearly financial report including disclosures made therein
- Reviewed reports from the external auditor on their work and findings
- Reviewed the effectiveness of the Group's internal control environment.

Internal controls and compliance

- Agreed a schedule of internal audit activities, and reviewed the results of internal audit activities performed
- Reviewed the internal financial controls and risk management systems
- Reviewed fraud detection and the systems and controls for the prevention of bribery
- Reviewed and approved new Company policies, including the capitalisation policy and the corporate criminal offence policy.

External audit

- Reviewed and agreed the scope of the audit work to be undertaken by the auditor, and reviewed non-audit services provided and the level of this work compared with the audit services provided
- Agreed the fees to be paid to the external auditor relating to their services rendered for the annual audit and interim review
- Reviewed audit work performed on significant risk areas, including those areas identified and discussed by the external auditor in their report, and ensured the independence and objectivity of the external auditor
- Reviewed the planning and approach to the audit tender.

The Chairman of the Audit Committee will be available at the AGM to answer any questions about the work of the Committee.

External auditor

Deloitte LLP have been the Company's auditor for almost ten years since 2009 and there has been no tender held for audit services during that time. The Committee considers that the auditor's knowledge of the Group's business and systems gained through experience has contributed to the effectiveness of the audit process. The Committee intends the Company to continue to comply fully with the FRC Audit Committees Guidance regarding the frequency of audit tender. Under EU legislation and UK Statutory Auditors regulations, retendering of statutory audits for listed companies after ten years and rotation after 20 years is required. Under the standard rotation process, a new audit engagement partner was appointed from 2014. The Company intends to hold a tender for audit services in 2019 ahead of the half year results. Deloitte will be invited to re-tender for the audit.

The Committee has noted that there are no contractual obligations to restrict the choice of external auditor and has considered the likelihood of a withdrawal of the auditor from the market. The Committee meets with the Company's auditor at least twice a year. The Chief Executive Officer and Chief Financial Officer, and other relevant managers as required, attend by invitation, except for a period of each meeting where the Committee members may meet with the auditor without any member of the Group management present.

The Committee is required to assess the qualifications, expertise, resources, and independence of the external auditor, and the objectivity and effectiveness of the audit process. The Committee reviews the type of work, effectiveness of, and level of fees charged by the auditor on an annual basis and recommends to the Board the appointment, reappointment, term, remuneration, and terms of engagement of the external auditor. Auditor objectivity and independence is safeguarded by the Committee monitoring fees paid to the auditor. Since 2017, it is the policy of the Group not to engage the Statutory auditor in any non-audit related services. This includes tax services. Specifically, the Policy states that the preparation of tax forms, payroll tax, calculation of indirect tax and the provision of tax advice cannot be provided by the Statutory auditor.

Note 7 to the Consolidated financial statements includes disclosure of the auditor's remuneration for the year.

The Committee, taking into consideration relevant UK professional and regulatory requirements, regularly considers the independence and objectivity of the auditor. The Committee receives an annual statement from the auditor detailing their independence policies and safeguards, and confirming their independence, taking into account relevant ethical guidance regarding the provision of non-audit services by the external auditor.

The Committee considers the effectiveness of the external audit and the Group's relationship with the external auditor, Deloitte LLP, on an ongoing basis, and has conducted a review of the effectiveness of the annual audit. This review consisted of considering a number of key points together with the senior financial management of the Group, without the external auditor present, and then discussing the evaluation with the auditor. The Committee was able to conclude, on the basis of this exercise and its experience over the year, that the external audit process remained effective.

A further review will be carried out following the completion of audit procedures on all Group companies and reported on in next year's Annual Report.

Andrew Herbert
Chairman of the Audit Committee

GOVERNANCE continued

Nomination Committee

Robin Williams
Chairman of the Nomination Committee

The Nomination Committee is appointed by the Board from the Non-Executive Directors of the Company and the Chief Executive Officer.

The Chairman of the Committee is Robin Williams. The Committee meets as required, but at least twice a year. The written terms of reference of the Committee are available on request from the Company Secretary.

Responsibilities

The Nomination Committee's primary responsibilities are:

- Reviewing the size, structure, skills, knowledge, independence and composition of the Board
- Formulating plans for succession for both Executive and Non-Executive Directors
- Making recommendations to the Board on the appointment of new Executive and Non-Executive Directors and their reappointment following retirement by rotation.

Boardroom diversity

Recruitment of Board candidates is conducted, and appointments made, on merit and suitability against objective selection criteria with consideration of, amongst other things, the benefits of diversity on the Board, including gender. The Board has not set a diversity quota, however the Board encourages applications for roles being recruited from women subject to the selection criteria being met. Following the resignation of Lily Liu from the Board on 14 November 2018, the gender ratio is 17% female versus 83% male.

Key issues and activities

The process adopted by the Committee to identify a candidate for a specific vacancy is, in the first instance, to determine whether any external individuals known to the Committee or internal candidates would be suitable for the role. If no compelling candidates can be identified through this process then an external search consultancy will be approached. Even if a suitable internal candidate exist, an external mapping process may be used, as in the case of the Chief Financial Officer appointment in the year, to confirm the choice.

Shortlisted candidates are interviewed by members of the Committee and other Executive and Non-Executive Directors as the Committee deems appropriate. Once a suitable candidate has been identified, the Chairman of the Committee will recommend to the Board that the Company make a formal offer of employment to the candidate.

During the year, Shomit Kenkare was appointed as the new Chief Financial Officer on 15 November 2018, an internal promotion, but validated by external mapping as described above.

All Directors are required to submit themselves for reappointment every year at the AGM.

Robin Williams
Chairman of the Nomination Committee

Remuneration Committee

Margaret Rice-Jones
Chairman of the Remuneration Committee

The Remuneration Committee is appointed by the Board from the Non-Executive Directors of the Company.

The Chairman of the Committee is Margaret Rice-Jones. The Chief Executive Officer and other senior personnel attend meetings by invitation, except when their own remuneration package is being discussed. The written terms of reference of the Committee are available on request from the Company Secretary.

Responsibilities
The Remuneration Committee's primary responsibilities are:

- To make recommendations to the Board on the Group's policy for executive remuneration, and review the ongoing appropriateness and relevance of the policy
- To review the design of all share incentive plans and oversee any major changes in employee benefit structures
- To monitor the level and structure of remuneration for senior managers
- To determine the individual remuneration packages on behalf of the Board for the Executive Directors of the Group.

Key issues and activities
The Committee has access to professional advice, both inside and outside the Company, in the furtherance of its duties.

A new policy was adopted at the AGM in May 2017. Therefore the main activities of the Committee this year have been the establishment of employee engagement and the operation of the remuneration policy for Directors along with considering and applying the new guidance available to the Committee from shareholder bodies, government and other stakeholders.

The Committee also considered the application of the output of the strategic review to the 2019 forward looking remuneration contained in this report.

The Directors' Remuneration report sets out in more detail the Committee's policies and practices on Executive remuneration.

Margaret Rice-Jones
Chairman of the Remuneration Committee

GOVERNANCE continued

Directors' Remuneration report

Statement from the Chairman of the Remuneration Committee

Dear Shareholder

On behalf of the Board, I am pleased to present the 2018 Remuneration report. This covers the actual amounts earned by Directors for the year ended 31 December 2018 and a forward looking guide to changes proposed to the performance measures within the Annual Bonus and Long Term Incentive plans in the light of current trading priorities.

The Committee's goals are:

- Attracting and retaining management of the highest calibre
- Providing incentives that reward near and longer term achievement that are clearly linked to performance and Company strategy
- Offering competitive packages comparable to those offered by companies similar to Xaar in terms of size and complexity
- Being considerate to the climate for pay restraint, with awards biased towards delivery of sustainable long term growth
- Being considerate to the current share price and trading performance of the business
- Taking into account the views of our shareholders.

Remuneration for 2018

During 2018 the challenging trends we had experienced in 2017 continued to impact the growth and development of the Company. The Ceramics market continued to decline and further delays were experienced in the manufacturing ramp up of the new Thin Film Xaar 5601 product. Strong progress was made in the 3D area with the formation of Xaar 3D Limited, a joint investment with Stratasys, as announced on 12 July 2018.

During the year we were pleased to welcome Shomit Kenkare to the Board as he succeeded Lily Liu as Chief Financial Officer.

Annual bonus payments

Following the profit warning in late 2018 no bonus payments will be made to employees or Directors against the revenue and profit targets. The Committee considers this appropriate given the performance of the underlying business. We were disappointed with the slower than expected adoption of some of our new products and also the increased competition and maturity in Ceramics. Threshold revenue and profit targets for the annual bonus were not met and no bonus was paid in respect of these elements.

Doug Edwards received a bonus of £51,750 for the achievement of the cash related portion of his bonus plan (weighting 12%). This related to improvement in the cash reserves of the Company with the full receipt of the £10 million in cash from the new SII royalty scheme by the end of March 2018.

Clawback of payments to Lily Liu

Lily Liu left Xaar before she had completed 24 months with the Company. In line with its policy the Committee implemented the clawback policy in full in relation to the 2017 bonus paid, relocation and LTIP awards.

Existing LTIP grants

The LTIPs granted in 2016 will not vest. Cumulative EPS over the three year performance period ending 31 December 2018 was 21.7 pence below the vesting threshold on that element of the grant. Threshold vesting was at 38 pence and maximum at 56 pence. Aon Hewitt has independently calculated the Relative TSR measured against the FTSE TechMARK All Share Index. This also fell below the vesting threshold on that element.

All terms of the 2017 and 2018 grants remain unchanged. At this point it looks unlikely that the revenue and EPS targets for the 2017 grant will be met.

Leading remuneration decisions for 2019

The policy was renewed with a binding vote at the AGM in May 2017. The Committee has exercised their discretion which is in accordance with the policy.

For 2019 remuneration links directly to the goals laid out following the strategic review commenced in late summer 2018.

Base salary

An Executive Director's basic salary is set on appointment and reviewed annually or when there is a change in position or responsibility.

When determining an appropriate level of salary, the Committee considers:

- General salary rises to employees
- Remuneration practices within the Company
- Any change in scope, role and responsibilities
- The general performance of the Company
- The experience of the relevant Director
- The economic environment
- When the Committee determines a benchmarking exercise is appropriate (normally every three years) salaries within the ranges paid by the companies in the comparator groups used for remuneration benchmarking.

Individuals who are recruited or promoted to the Board may, on occasion, have their salaries set below the targeted policy level until they become established in their role. In such cases subsequent increases in salary may be higher than the general rises for employees until the target positioning is achieved.

For 2019 no increases are proposed for any Directors including Non-Executive Directors. The Board considers this appropriate given the profit warning in 2018 and the decline in share price over 2018.

Bonus

Introduction of a cash performance measure for all Executive Directors

In 2019 the weighting of bonus elements for Doug Edwards and Shomit Kenkare will be:

- Profit improvement 70%
- Cash flow enhancement 30%.

Following the completion of the strategic review the Committee may also include some strategic goals related to the actions arising from the review. These would not form more than 30% of the total bonus which would still be subject to the 1.25x cap in the case of the Chief Executive Officer and 1x cap in the case of the Chief Financial Officer. Any strategic targets agreed by the Committee will be fully aligned to the output of the strategic review. Any proposed payments will be audited and disclosed separately. The Company considers its performance targets to be commercially sensitive information but as in past years will fully disclose the exact measurements retrospectively in the event of any pay out.

Long term incentives

Three year cumulative EPS targets

The targets have been set for the achievement of a three year cumulative EPS measure. The Committee believes that following the strategic review, this measure continues to align management and shareholders in delivering the longer term opportunities for our new Printhead products and in our new business areas of 3D Printing and Product Print Systems and therefore addressing the current weak trading performance.

Due to commercial sensitivity these EPS targets will not be disclosed at this time when the actions from strategic review are yet to be fully implemented. They will be fully disclosed retrospectively as we do with the annual bonus.

Revenue growth

Recent weak trading has been due to challenges in our Printhead business and revenue decline in Ceramics. The Committee therefore considers it appropriate to establish targets for revenue growth as a result of transforming Xaar into a more diversified and customer centric organisation delivering on our longer term opportunities. As described in the Chief Executive Officer report, we are reporting on our three business units and therefore, we have set a target for our Printhead business unit and a separate, combined target for our 3D Printing and Product Print Systems business units.

Targets have been set as follows:
Printhead Business Unit - Revenue in 2021:

- Maximum: £78 million
- Minimum: £54 million.

3D Printing and Product Print Systems Business Units – Revenue in 2021:

- Maximum: £37 million
- Minimum: £24 million.

A straight line will operate between the targets.

The weighting of the three measures for LTIP vesting will be:

- Three year cumulative EPS 50%
- Revenue growth in Printhead Business Unit 20%
- Revenue growth in 3D Printing and Product Print Systems 30%.

All other terms remain unchanged from the 2018 plans.

UK Corporate Governance Code

The Committee has also considered the guidance of the UK Corporate Governance Code. Malus clawback and underpin provisions have been in place for some time and are unaltered. The Committee introduced post vesting holding periods at the time of the last policy review and also increased the minimum target shareholding requirements to 200%, these are all considered appropriate for a company of the size of Xaar. No further changes were made during the year and the full policy will be reconsidered again before a binding vote in 2020 when post-employment holding periods and pension arrangements will be considered by the Committee as part of its discussions.

Employee engagement

The strategic review provided an ideal context in which to introduce the wider employee engagement recommended by the recent changes in the UK Corporate Governance Code. The Board felt that this should cover a wide range of topics and input into the future of the Company and not be limited to remuneration matters. The Committee also recognised that the various strategic options would not impact the business in a uniform manner. As such we felt that it was appropriate that all Non-Executive Directors participate in this rather than a single nominated Director or the appointment of a single employee to the Committee. Two employee groups were established one in Cambridge and one in our manufacturing location in Huntingdon with employees drawn from as wide range of functions within the business as possible to ensure all views were represented. They met with the Non-Executive Directors in December and will continue to meet together at least 3 times a year in future to ensure that all Non-Executives can better appreciate employee perspectives as they participate in Board discussions.

These forums are supplemented by data from the all employee survey that has been in place for several years which provides an opportunity for anonymous feedback from all employees around the globe.

Shareholder communications

We remain committed to openly reporting the details of our Director pay arrangements and to consulting with shareholders on any changes as required. We will continue to maintain a dialogue with investors regarding our disclosures to ensure we clearly communicate our arrangements as far as possible without it impacting our commerciality. If you would like to discuss any aspect of this report, I would be happy to hear from you.

For 2020 we will be establishing a new policy and will commence a period of consultation on this with all shareholders later in 2019. This will allow us to ensure that all future awards are closely aligned to the future strategy and direction of the business following conversations with shareholders after the strategic review.

You may contact me through Camila Cottage, Company Secretary or Karen Leahy, who provides support to the Non-Executive Directors.

Margaret Rice-Jones
Chairman of the Remuneration Committee
21 March 2019

GOVERNANCE continued

Directors' Remuneration report continued

Annual report on remuneration

This part of the report sets out the actual payments made by the Company to its Directors with respect to the year ended 31 December 2018.

The Remuneration Committee's policy is to attract and retain individuals of the highest calibre by offering remuneration competitive with comparable publicly listed companies, and to drive Company performance by providing arrangements which fairly and responsibly reward individuals for their contribution to the success of the Group. Performance related bonuses and equity-based remuneration represent a substantial proportion of Executive Directors' potential remuneration.

The information provided in this part of the Directors' Remuneration report is subject to audit.

Single figure table

The aggregate remuneration provided to Directors who have served as Directors in the year ended 31 December 2018 is set out below, along with the aggregate remuneration provided to such Directors for the financial year ended 31 December 2017.

Year ended 31 December 2018

Director	Salary/fees[a] £'000	Benefits[b] £'000	Bonus[c] £'000	Long term incentives[d] £'000	Pension[e] £'000	Clawback[4] £'000	Total remuneration £'000
Executive							
Doug Edwards	345	71	52	–	34	–	502
Lily Liu[1]	200	1	–	–	20	(77)	144
Ted Wiggans[2]	139	15	–	–	14	–	168
Non-Executive							
Robin Williams (Chairman)	102	–	–	–	–	–	102
Margaret Rice-Jones	48	–	–	–	–	–	48
Chris Morgan	44	–	–	–	–	–	44
Andrew Herbert	47	–	–	–	–	–	47

Director	Salary/fees[a] $'000	Benefits[b] $'000	Bonus[c] $'000	Long term incentives[d] $'000	Pension[e] $'000	Clawback[4] $'000	Total remuneration $'000
Shomit Kenkare[3]	38	4	–	–	4	–	46

Year ended 31 December 2017

Director	Salary/fees £'000	Benefits £'000	Bonus £'000	Long term incentives £'000	Pension £'000	Clawback £'000	Total remuneration £'000
Executive							
Doug Edwards	330	56	–	175	33	–	594
Lily Liu	152	36	77	18	15	–	298
Alex Bevis	48	5	–	73	5	–	131
Ted Wiggans	230	24	–	106	23	–	383
Non-Executive							
Robin Williams (Chairman)	100	–	–	–	–	–	100
Margaret Rice-Jones	47	–	–	–	–	–	47
Chris Morgan	43	–	–	–	–	–	43
Andrew Herbert	46	–	–	–	–	–	46

1 Lily Liu stepped down from the Board on 14 November 2018.
2 Ted Wiggans stepped down from the Board on 31 March 2018 following his previously announced retirement.
3 Shomit Kenkare joined the Board on 15 November 2018 and his salary is paid in US Dollars.
4 The bonus and relocation allowance paid to Lily Liu was clawed back following her resignation.

The figures in the single figure table on page 58 are derived from the following:

(a) Salary/fees	The amount of base salary/fees received in the year.
(b) Benefits	This is the taxable value of benefits and the flexible benefits allowance received in the year. This includes any relocation allowance claimed in 2018.
(c) Bonus	The value of the bonus earned in respect of the year.
(d) Long Term Incentives	The value of performance related incentives vesting in respect of the financial year and the value of SAYE options and Matching Shares under the HMRC approved Share Incentive Plan (SIP) granted based on the fair value of the options/shares at grant. The performance condition for the Performance Share Awards granted under the LTIP on 1 April, 11 May and 25 August in 2016 was a cumulative EPS amount delivered over the three year performance period ending 31 December 2018 plus a relative TSR measure. For the year ended 31 December 2018, the Company's EPS achieved 16.3 pence over the three year performance period commencing 1 January 2016 and ending 31 December 2018, and Xaar was ranked 37th against the 37 companies in the FTSE TechMARK Index during the performance period. This will result in 0% of the granted LTIPs vesting in 2019. For the year ended 31 December 2017 comparative figures, 55% of the Performance Share Awards and Matching Share Awards in respect of the year ending 31 December 2017 vested.
(e) Pension	The value of the employer contribution to the defined contribution pension plan in the UK or the 401k plan in US (or the value of a salary supplement paid in lieu of a contribution to this pension plan).

Individual elements of remuneration

Base salary and fees

Base salaries for Executive Directors were reviewed by the Remuneration Committee prior to the beginning of each year and when an individual changes position or responsibility. From 2019, the annual review will be effective from 1 January. In deciding appropriate levels, the Remuneration Committee considers the role, responsibility, and experience of the individual, corporate and individual performance, market conditions, and the range of salary increases awarded across the Group.

The Remuneration Policy for the Non-Executive Directors is reviewed periodically.

Benefits

UK Benefits principally comprise a car allowance, private medical insurance and basic levels of other insurances (such as income protection cover). In addition, UK Executive Directors are provided with an allowance of 5% of base salary which they can apply to a range of benefits such as life insurance and critical illness insurance. US Benefits comprise of health insurances including medical, vision and dental.

Pension

The Company operates a self-administered, defined contribution, HMRC approved pension scheme. UK Executive Directors participate in this scheme. In appropriate circumstances, Executive Directors may take a salary supplement instead of contributions into a pension plan. This salary supplement does not form part of salary for the purposes of calculating any other entitlement under the policy. US Executive Directors participate in a 401k plan. Non-Executive Directors do not receive pension contributions.

GOVERNANCE continued

Directors' Remuneration report continued

Annual bonus

For the year ended 31 December 2018 the annual bonus was based on performance against Group profit and revenue targets, which were not achieved for 2018. As a consequence, an annual bonus in respect of these elements will not be paid for 2018.

For 2018, a cash element was introduced for Doug Edwards and this resulted in a bonus payment of £51,750. The bonus was for the achievement of the cash related portion of his bonus plan (weighting 12%). This related to improvement in the cash reserves of the Company with the full receipt of the £10 million in cash from the new SII royalty scheme by the end of March 2018.

Following Lily Liu's resignation, the Remuneration Committee agreed to clawback the guaranteed bonus amount of £76,877.

No bonus was paid to Ted Wiggans or Shomit Kenkare.

For 2018 the two bonus targets were set as revenue and adjusted profit before tax, and for Doug Edwards only, a cash target. For revenue the threshold was set at £95 million and the on target performance was £105 million; the minimum threshold was not met. For adjusted profit before tax the threshold was £8 million and the on target performance was £11 million. The threshold was not met.

Long term incentives awarded during the financial year

The table below outlines awards made under the LTIP to Executive Directors in 2018:

		Award basis	Performance condition	Number of shares	Face value of the award £'000	Vesting at EPS & Revenue threshold	Performance period	Vesting date
3 April 2018	Doug Edwards		EPS	77,470	259			3 April 2021
			TSR	154,940	517			3 April 2021
			New product revenue	30,988	104		1 January 2018 to	3 April 2021
			Revenue	46,482	155	25% of award	31 December 2020	3 April 2021
3 April 2018	Lily Liu[1]		EPS	34,431	115			3 April 2021
		Performance Share plan Awards	TSR	34,431	115		1 January 2018 to	3 April 2021
			New product revenue	13,772	46	25% of award	31 December 2020	3 April 2021
			Revenue	20,659	69			3 April 2021
3 April 2018	Ted Wiggans[2]		EPS	34,431	115			3 April 2021
			TSR	34,431	115	25% of award	1 January 2018 to	3 April 2021
			New product revenue	13,772	46		31 December 2020	3 April 2021
			Revenue	20,659	69			3 April 2021

1 Lily Liu's LTIP lapsed in full on her termination date.
2 Ted Wiggans will be treated as a Good Leaver. His LTIP has subsequently been pro-rated to the proportion of period worked during the vesting period.

The share prices used to calculate the face value of the Performance Share award was £3.34 being the mid-market prices on the days prior to award date.

The performance conditions for the LTIP and awards are described in full on pages 123 to 124.

Shareholding guidelines and total shareholdings of Directors

On 16 May 2017, the Remuneration Committee introduced a shareholding guideline of 2x salary. Executive Directors will be expected to move towards the new guidelines as new grants vest. The extent to which each Executive Director has met the shareholding guideline is shown in the table below:

Name	Shareholding guidelines	Current shareholdings (% of salary)	Type	Owned outright	Vested	Unvested: Subject to performance conditions	Unvested: Not subject to performance conditions	**Total as at 31 December 2018**
Executive Directors								
Doug Edwards	200% of salary	33,031 (14%)	Shares	33,031	–	–	–	**33,031**
			LTIP options	–	40,134	685,739	–	**725,873**
			SAYE options	–	4,316	–	–	**4,316**
			Matching SIP	–	–	–	854	**854**
Shomit Kenkare[1]	200% of salary		Shares	–	–	–	–	**–**
			LTIP Options	–	–	10,000	–	**10,000**
Lily Liu[2]	200% of salary	14,000 (9%)	Shares	14,000	–	–	–	**14,000**
			LTIP options	–	–	–	–	**–**
Ted Wiggans[3]	200% of salary	70,749 (45%)	Shares	70,749	–	–	–	**70,749**
			LTIP options	–	–	87,300	–	**87,300**
Non-Executive Directors								
Robin Williams (Chairman)	–	–	Shares	10,000	–	–	–	**10,000**
Margaret Rice-Jones	–	–	Shares	5,700	–	–	–	**5,700**

1 Shomit Kenkare's LTIPs were granted before his appointment to the Board.
2 Lily Liu stepped down from the Board on 14 November 2018. Lapsing occurred at the point of stepping down.
3 Ted Wiggans stepped down from the Board on 31 March 2018 and retired from the Group on 9 August 2018. Ted has been treated as a Good Leaver so LTIPs grants are pro-rated for time served during vesting period. The lapsed proportion occurred at the point of retirement.

There have been no changes in the Directors' holdings in the share capital of the Company, as set out in the table above, between 31 December 2018 and 21 March 2019.

GOVERNANCE continued

Directors' Remuneration report continued

Outstanding Directors' share awards

The awards held by Executive Directors of the Company under the LTIP are shown below:

LTIP

The outstanding awards granted to each Executive Director of the Company under the Xaar plc 2007 and 2017 LTIP are as follows. All options under the LTIP are nil-cost options such that no exercise price is payable. The performance conditions for these LTIP awards are described in full in note 32.

Name	As at 1 January 2018	Granted during the year	Exercised during the year	Lapsed during the year	**As at 31 December 2018**	Grant date	Share price at date of grant	Earliest date of exercise	Expiry date
Doug Edwards	73,305	–	–	(33,171)	**40,134**	2 April 2015	£4.09	2 April 2018	2 April 2025
	61,539	–	–	–	**61,539**	1 April 2016	£4.875	1 April 2019	1 April 2026
	11,494[4]	–	–	–	**11,494**	11 May 2016	£4.93	11 May 2019	11 May 2026
	47,559	–	–	–	**47,559**	25 August 2016	£4.9675	25 August 2019	25 August 2026
	255,267	–	–	–	**255,267**	16 May 2017	£3.702	16 May 2020[5]	16 May 2027
	–	309,880	–	–	**309,880**	3 April 2018	£3.34	3 April 2021[5]	3 April 2028
	449,164	**309,880**	**–**	**(33,171)**	**725,873**				
Shomit Kenkare[1]	–	10,000	–	–	**10,000**	1 June 2018	£2.985	1 June 2021	1 June 2028
	–	**10,000**	**–**	**–**	**10,000**				
Ted Wiggans[2]	44,716	–	(24,482)	(20,234)	**–**	2 April 2015	£4.09	2 April 2018	2 April 2025
	47,179	–	–	(10,380)	**36,799**	1 April 2016	£4.875	1 April 2019	1 April 2026
	93,193	–	–	(54,053)	**39,140**	16 May 2017	£3.702	16 May 2020[5]	16 May 2027
	–	103,293	–	(91,932)	**11,361**	3 April 2018	£3.34	3 April 2021[5]	3 April 2028
	185,088	**103,293**	**(24,482)**	**(176,599)**	**87,300**				
Lily Liu[3]	93,193	–	–	(93,193)	**–**	16 May 2017	£3.702	16 May 2020[5]	16 May 2027
	31,979	–	–	(31,979)	**–**	16 May 2017	£3.7525	16 May 2020	16 May 2027
	125,172	**–**	**–**	**(125,172)**	**–**				

1 Shomit Kenkare's LTIPs were granted before his appointment to the Board.
2 Ted Wiggans stepped down from the Board on 31 March 2018 and retired from the Group on 9 August 2018. Ted has been treated as a Good Leaver so LTIPs grants are pro-rated for time served during vesting period. The lapsed proportion occurred at the point of retirement for unvested grants made after 2015.
3 Lily Liu stepped down from the Board on 14 November 2018. Lapsing occurred at the point of stepping down.
4 LTIPs granted as part of the bonus matching scheme.
5 A two year hold is in place with 33% being held for one year and 33% two years after vesting.

All employee share plans

The Executive Directors may participate in the Company's all employee share plans, the Xaar plc SAYE Scheme (SAYE Scheme) and the Xaar SIP, on the same basis as other employees.

The SAYE Scheme provides an opportunity to save a set monthly amount (up to £500) over three years towards the exercise of a discounted share option, which is granted at the start of the three years.

The SIP provides an opportunity for employees to buy shares from their pre-tax remuneration up to the limit permitted by the relevant tax legislation (currently £1,800 per year) and are awarded additional shares for free on a matching basis; the Company currently operates the plan on the basis of a 1:1 match but may award Matching Shares up to the maximum ratio permitted by the relevant tax legislation (currently a 2:1 ratio).

Options and awards under these plans are not subject to performance conditions.

The outstanding awards granted to each Executive Director under the SAYE Scheme are as follows:

Name	As at 1 January 2018	Granted during the year	Lapsed during the year	Exercised during the year	**As at 31 December 2018**	Grant date	Exercise price	Earliest date of exercise	Expiry date
Doug Edwards	4,316	–	–	–	**4,316**	1 November 2015	£4.17	1 November 2018	1 May 2019
Lily Liu	5,232	–	(5,232)	–	**–**	1 November 2017	£3.44	1 November 2020	1 May 2021
Ted Wiggans	5,325	–	(5,325)	–	**–**	1 November 2014	£3.38	1 November 2017	1 May 2018

The outstanding awards granted to each Executive Director under the SIP are as follows:

Name	**Total number of matching shares as at 31 December 2018**
Doug Edwards	**854**
Ted Wiggans	**–**

Payments for loss of office made during the year

On 31 March 2018 Ted Wiggans stepped down from the Board. He remained on gardening leave until his retirement date of 9 August 2018 at which point his pay and benefits ceased. Ted did not receive a bonus payment. He was granted good leaver status on his outstanding share awards and they were pro-rated to the proportion of time served during the vesting period and will vest in line with the normal vesting dates and performance conditions.

Lily Liu stepped down from the Board on 14 November 2018. No payments for loss of office were made and her outstanding share awards lapsed on her termination date. As stated, there was a clawback of bonus and relocation allowance.

Payments to past Directors

On 29 March 2017 Alex Bevis, Chief Financial Officer left Xaar. His unvested LTIPs were pro-rated and subject to the original vesting date and performance conditions. Overall 55% of the pro-rated LTIPs granted in 2015 vested and Alex exercised his option in 2018.

GOVERNANCE continued

Directors' Remuneration report continued

The information provided in this part of the Directors' Remuneration report is not subject to audit.

Performance graph and table
The graph on this page shows the Company's performance measured by total shareholder return (TSR), compared with the performance of the FTSE TechMARK All Share Index, which the Remuneration Committee considers to be the most appropriate index for comparison because they illustrate the Company's TSR performance against a broad equity market index of similar UK companies.

Total Shareholder Return

Source: Datastream (Thomson Reuters).

This graph shows the value, by 31 December 2018, of £100 invested in Xaar on 31 December 2008, compared with the value of £100 invested in the FTSE TechMARK All Share and FTSE Small Cap Indices on the same date on a yearly basis.

The other points plotted are the values at intervening financial year-ends.

The table below shows details of the total remuneration, annual bonus (as a percentage of maximum opportunity) and LTIP vesting percentage for the Chief Executive Officer over the last ten financial years.

	Total remuneration	Annual bonus as a % of maximum opportunity	LTIP as a % of maximum opportunity
Year ended 31 December 2018	502	12%	0%
Year ended 31 December 2017	594	0%	50%
Year ended 31 December 2016	429	12.5%	0%
Year ended 31 December 2015	571	48%	0%
Year ended 31 December 2014	562	0%	100%
Year ended 31 December 2013	1,379	83%	100%
Year ended 31 December 2012	649	53%	100%
Year ended 31 December 2011	1,244	100%	100%
Year ended 31 December 2010	504	80%	32%
Year ended 31 December 2009	229	0%	0%

Chief Executive Officer pay increase in relation to all employees

The table below sets out in relation to salary and annual bonus the increase between the pay for the year ended 31 December 2017 and the pay for the year ended 31 December 2018 for the Chief Executive Officer compared with the average increase/bonus award between the same periods for the wider workforce. For the purposes of the table below, the wider workforce has been defined as the UK employees of the Group. This comparator group was chosen because it is the most relevant sub-set of employees and can be used consistently.

Element of remuneration	CEO	Wider workforce average
Salary – % change	0%	2.42%
Annual bonus – absolute % of salary paid	15%	0%
Benefits – absolute % of salary paid	21%	9%

Spend on pay

The table below sets out the Group's distributions to shareholders by way of dividends and total Group-wide expenditure on pay for all employees (including employer social security, pension contributions and share-based payments), as reported in the audited financial statements for the financial year ended 31 December 2018.

	2018 £'000	2017 £'000	Change %
Dividends paid to shareholders	**6,009**	7,728	(22%)
Group-wide expenditure on pay for all employees (note 8)	**25,523**	33,932	(25%)

Implementation of Directors' Remuneration Policy for the financial year commencing 1 January 2019

Information on how the Company intends to implement the policy for the financial year commencing 1 January 2019 is set out below.

We want our remuneration policy to support the transformation of Xaar to lead the digital inkjet revolution and support the outcome of our strategic review. A new three year policy was approved in 2017 to drive the delivery of the vision, to retain the key Executive talent required to deliver the transformation and to align Executive and shareholder interests.

Basic salary and fees

Our approach on base salary continues to be to provide a fixed remuneration component which reflects the increased experience and heightened complexity of the roles and the increasing business and geographic diversity.

Salary review for the workforce has moved to January and the next review date for the Executive and Non-Executive Directors will be January 2020.

The Remuneration Committee does not consider it to be appropriate to increase base salary for the Chief Executive Officer or Chief Financial Officer for 2019.

The proposed base salary increases for the Executive Directors are shown below:

	Review date	2018	2019	% increase
Doug Edwards	1 Jan 2019	£345,000	£345,000	0%
Shomit Kenkare	1 Jan 2019	$294,000	$294,000	0%

The Non-Executive Directors will not receive a fee increase for 2019.

	Additional duties	Additional fees	Review date	2018	2019	% increase
Robin Williams			1 Jan 2019	£102,000	£102,000	0%
Margaret Rice-Jones	Rem Com & SID	£4,000	1 Jan 2019	£44,300	£44,300	0%
Andrew Herbert	Audit Committee	£3,000	1 Jan 2019	£44,250	£44,250	0%
Chris Morgan			1 Jan 2019	£44,100	£44,100	0%

GOVERNANCE continued

Directors' Remuneration report continued

Annual bonus

No significant changes have been made to the total bonus structure, therefore, the maximum opportunity for the Chief Executive Officer is 125% and for the Chief Financial Officer is 100% of salary. The core performance metrics of the bonus are profit and cash. A cash component will be added for the Chief Financial Officer for 2019; a cash component was part of the bonus for the Chief Executive Officer in 2018.

The Board considers the Group profit and cash targets for 2019 to be matters that are commercially sensitive and should therefore remain confidential to the Company. It provides our competitors with insight into our business plans, expectations and our strategic actions. However, the Remuneration Committee will disclose on a retrospective basis how the Company's performance relates to any annual bonus payments made.

Long term incentives

We will be measuring revenue growth in the Printhead business unit and revenue growth in the 3D Printing and Product Print Systems business units. These targets will be cumulative and measured over the three years from 2019 to 2021. They will have an appropriate minimum threshold and straight-line vesting to a stretching maximum achievement.

We will continue to measure EPS but due to commercial sensitivity these EPS targets will not be disclosed at this time when the actions from strategic review are yet to be fully implemented. They will be fully disclosed retrospectively.

Consideration by the Directors of matters relating to Directors' remuneration

Membership

The Company has established a Remuneration Committee which is constituted in accordance with the recommendations of the UK Corporate Governance Code. The terms of reference of the Remuneration Committee can be obtained by contacting the Company Secretary.

The Remuneration Committee is chaired by Margaret Rice-Jones. The other members during the year ended 31 December 2018 were Robin Williams, Andrew Herbert and Chris Morgan. All members of the Remuneration Committee are considered independent within the meaning of the UK Corporate Governance Code.

The principal function of the Remuneration Committee is to determine, on behalf of the Board, the specific remuneration and other benefits of Executive Directors, including pension contributions, bonus arrangements, long term incentives and service contracts. The fees paid to the Non-Executive Directors are determined by the Chief Executive Officer and the Chairman. The fees paid to the Chairman are determined by the Chief Executive Officer and the Non-Executive Directors.

Additionally, the Remuneration Committee makes recommendations to the Board on the framework of Executive Director remuneration as well as principal Company-wide compensation programmes.

The members of the Remuneration Committee have no personal financial interest, other than as shareholders, in the matters to be decided, no actual or potential conflicts of interest arising from other directorships and no day to day operational responsibility within the Company. Executive Directors are entitled to accept appointments outside the Group providing that the Chairman's permission is sought.

Advisors to the Remuneration Committee

The Remuneration Committee is assisted in its work by Xaar's human resources department. The Chief Executive Officer is consulted on the remuneration of those who report directly to him and also of other senior executives. No Executive Director or employee is present or takes part in discussions in respect of matters relating directly to their own remuneration.

During the year, the Remuneration Committee was assisted in its work by the following external consultants:

Advisor	Details of appointment	Services provided by the advisor	Fees paid by the Company for advice to the Remuneration Committee and basis of charge	Other services provided to the Company in the year ended 31 December 2018
Willis Towers Watson	Appointed by the Remuneration Committee in 2016	Consulting advice regarding target setting	£3,795	–

Shareholder voting

The Company remains committed to ongoing shareholder dialogue and takes an active interest in voting outcomes. The following table sets out actual voting in respect of the resolution to approve the Directors' Remuneration report for the year ended 31 December 2017.

Number of votes	For (including discretion)	Against	Withheld
Resolution 11 – Directors' Remuneration report for the year ended 31 December 2017	60,110,387 (93.9%)	3,892,068 (6.1%)	500,253
Resolution 13 – Directors' Remuneration policy – approved at the 2017 AGM	54,599,814 (86.2%)	8,720,060 (13.8%)	1,527,691

Directors' Remuneration Policy

This part of the report sets out the Company's Directors' Remuneration Policy, which took binding effect from 16 May 2017. The Policy is determined by the Remuneration Committee.

The Directors' Remuneration Policy is not audited.

Policy table for Executive Directors

The table below describes each of the elements of the remuneration package for the Executive Directors. This is the proposed policy to run until May 2020.

Base salary

Objective	Core element of fixed remuneration that provides the basis to recruit and retain talent necessary to deliver the business strategy.
Operation	Normally reviewed annually and any increases generally apply from 1 January or 1 July (but may be reviewed more frequently if required). When determining base salary levels, consideration is given to the following: • Role, responsibility and experience of the individual • Corporate and individual performance • Market conditions including typical pay levels for comparable roles in companies of a similar size and complexity • The range of salary increases awarded across the Group.
Opportunity	No maximum salary opportunity has been set out in this policy report to avoid setting expectations for Executive Directors and employees. The base salaries effective as at 1 January 2019, are shown on page 65. The Remuneration Committee resolved to move base salaries progressively to a level which is market competitive (in general, positioned below median) taking account of individual factors such as: • Increase in scope and responsibility • A new Executive Director being moved to market positioning over time • Alignment to market level.
Performance measure	Not applicable.

GOVERNANCE continued

Directors' Remuneration report continued

Benefits	
Objective	Provide a market-competitive benefits package to recruit and retain Directors of the calibre required for the business. Participation in the Company's Share Incentive Plan (SIP) and Share Save Scheme (SAYE) encourages share ownership and alignment with the wider workforce.
Operation	Executive Directors receive base benefits including car allowance, private medical insurance, and basic levels of other insurances (such as critical illness cover). All UK staff, including Executive Directors, are also provided with a benefit allowance which they can apply to a range of benefits, including pension contributions. In some circumstances, and subject to Remuneration Committee approval, the allowance may be paid in cash rather than utilised to purchase benefits. The SIP and SAYE are HMRC approved share plans for all employees facilitating the acquisition of shares in the Company at a discount. Other benefits may be provided based on individual circumstances, such as, but not limited to: housing or relocation allowances, travel allowance or other expatriate benefits.
Opportunity	Whilst the Remuneration Committee has not set an absolute maximum on the level of benefits Executive Directors receive, the value of benefits is set at a level which the Remuneration Committee considers to be appropriately positioned taking into account relevant market levels based on the nature and location of the role and individual circumstances. The flexible benefits allowance is currently up to 5% of base salary. The Remuneration Committee has the authority to review and amend this rate as appropriate. Individuals have the choice to invest all or part of this amount in their pension scheme, in addition to the benefits outlined in the 'Retirement benefits' section of this table. SAYE and SIP limits as permitted in accordance with the relevant tax legislation.
Performance measures	Not applicable.
Retirement benefits	
Objective	Provide market competitive post-employment benefits to recruit and retain Directors of the calibre required for the business.
Operation	Executive Directors are eligible to participate in the defined contribution pension scheme (or such other pension plan as may be deemed appropriate). In appropriate circumstances, Executive Directors may take a salary supplement instead of contributions into a pension plan.
Opportunity	10% of base salary for the Executive Directors. The Remuneration Committee has the authority to review and amend this rate as appropriate.
Performance measures	Not applicable.

Annual bonus

Objective	Rewards performance against annual targets which support the strategic direction of the Company. The majority of staff participate in the same scheme.
Operation	Targets are set annually and any pay-out is determined by the Remuneration Committee after the period-end, based on performance against those targets. The Remuneration Committee has discretion to vary the bonus pay-out should any formulaic output not produce a fair result for either the Executive Director or the Company, taking account of the Remuneration Committee's assessment of overall business performance. The annual bonus is delivered in cash. Additionally Directors may opt to invest in the Company SIP (refer to note 32 for details).
Opportunity	Overall maximum annual bonus is 125% of salary for Chief Executive Officer and 100% for Chief Financial Officer and Chief Operations Officer. This will normally be subject to the following performance components: Profit The Company profit performance element represents 60% of the bonus and has a direct relationship with adjusted profit before tax, excluding any impact of IAS 38. A minimum profit threshold is set. Revenue growth The Company revenue performance element represents 40% of the bonus. This measure is based on revenue growth performance with a minimum profit threshold. The pay-out has the following parameters: • Below threshold performance: 0% of the maximum opportunity • On-target performance: 50% of the maximum opportunity • Maximum: 100% of the maximum opportunity. The Committee may vary the weighting of these measures and could consider alternative measures in future years.
Performance measures	Stretching performance targets are set each year reflecting the business priorities that underpin Group strategy. 125% (Chief Executive Officer) and 100% (Chief Financial Officer and Chief Operations Officer) of salary can be earned based on achieving the maximum financial performance targets and subject to individual performance.

GOVERNANCE continued

Directors' Remuneration report continued

Long Term Incentive Plan

Objective	Drive and reward the achievement of longer term objectives aligned closely to shareholders' interests. Retain key Executives over a longer term measurement period. Provide alignment with shareholders' interests. Support retention and promote share ownership.
Operation	Following the approval by shareholders in May 2017, the LTIP will operate as follows: An award of performance shares (zero priced share options) may be granted on an annual basis. The award is composed of two elements: • The base LTIP award is the primary element and will vest after three years subject to the achievement of the applied performance conditions • An outperformance multiplier will be applied to the base LTIP grant for the delivery of results relative to the FTSE Small Cap market. For upper quartile results, the base award will be multiplied by x1.167. For upper decile results, the Chief Executive Officer's base award will be multiplied by x2 (x1.5 for the Chief Financial Officer and Chief Operations Officer). Vesting will occur at the end of a three year period. A two year hold is introduced with 33% being held for one year after vesting and 33% being held for two years after vesting. Vested LTIP options must be exercised within ten years of the date of grant. Under the rules of the LTIP, the Remuneration Committee has discretion to satisfy vested LTIP awards in cash. On the vesting/exercise of an LTIP award, the Remuneration Committee has the discretion to decide that Executives can receive an amount (in cash or shares) equal to the dividends paid or payable between the date of grant and the vesting of an award on the number of shares which have vested. Awards may vest early on a change of control (or other relevant event) subject to the satisfaction of the performance conditions (as determined by the Remuneration Committee) and pro-rating for the LTIP was previously approved by shareholders in April 2007. The Remuneration Committee may at its discretion structure awards as Approved Long Term Incentive Plan (ALTIP) awards. ALTIP awards enable the participant and Company to benefit from HMRC approved option tax treatment in respect of part of the award, without increasing the pre-tax value delivered to participants. ALTIP awards may be structured either as an approved option for the part of the award up to the HMRC limit (currently £30,000) with an unapproved option for the balance and a 'linked award' to fund the exercise price of the approved option, or as an approved option and an LTIP award, with the vesting of the LTIP award scaled back to take account of any gain made on the exercise of the approved option. Other than to enable the grant of ALTIP awards, the Company will not grant awards to Executive Directors under the Executive Share Option Plan.
Maximum opportunity	The maximum annual award of the base LTIP will be 150% of base salary for the Chief Executive Officer and 100% of salary for the Chief Financial Officer and Chief Operations Officer. The outperformance multiplier could increase the maximum opportunity for the Chief Executive Officer to 300% of salary and to 150% for the Chief Financial Officer and Chief Operations Officer. For the LTIP, for threshold performance, 25% of award will vest. Straight-line vesting applies between threshold and maximum vesting. These limits do not include the value of shares subject to any approved option granted as part of an LTIP award.
Performance measures	Stretching performance targets are set each year reflecting the business priorities that underpin longer term Group strategy. The base LTIP award will normally be measured using the following: • Three year cumulative EPS growth – 60% • Three year revenue growth – 40%. The Remuneration Committee retains the discretion to alter the weighting of measures and to apply alternative or additional measures in future years. The outperformance multiplier will be measured against relative TSR of the FTSE Small Cap index.

Malus, clawback and underpin provisions

The Remuneration Committee has the right to:

- Reduce any LTIP awards which have not yet vested (i.e. a malus provision) if an act or omission contributes to a material misstatement of the Group's financial statements or results in material loss or reputational damage for the Company
- Recover cash or shares which have been paid or transferred (i.e. a clawback provision) if an act or omission contributes to a material misstatement of the Group's financial statements or results in material loss or reputational damage for the Company, for a period up to two years following determination of the vesting outcome
- Apply an underpin to LTIP vesting and bonus achievement and to flex the weighting of performance measure in the event of early vesting as a result of change of control.

Chairman and Non-Executive Directors

The table below sets out an overview of the remuneration of Non-Executive Directors

Alignment with strategy/purpose	Approach of the Company
Chairman and Non-Executive Directors' fees Provide an appropriate reward to attract and retain Directors of the calibre required for the business.	The remuneration of the Chairman of the Board is set by the Remuneration Committee and the Chief Executive Officer. Fees are set at a level which reflects the skills, knowledge, and experience of the individual, whilst taking into account appropriate market data. The fee is set as a fixed annual fee and may be paid wholly or partly in cash or Company shares. The Chairman and the Chief Executive Officer are responsible for deciding Non-Executive Directors' fees. Fees are set taking into account several factors, including the size and complexity of the business, fees paid to Non-Executive Directors of UK listed companies of a similar size and complexity, and the expected time commitment and contribution for the role. The fees are set as a fixed annual fee and may be paid wholly or partly in cash or Company shares. Overall fees paid to Directors will remain within the limit stated of £300,000 in our Articles of Association. Non-Executive Directors do not participate in any incentive scheme. Directors may be eligible to benefits such as the use of secretarial support, travel costs or other benefits that may be appropriate.

Explanation of performance metrics chosen

The annual bonus is assessed against financial targets which are determined by the Remuneration Committee, typically Group adjusted profit before tax excluding any impact of IAS 38 and revenue growth. This incentivises Executive Directors to focus on delivering the key financial goals of the Company. These targets therefore ensure that the interests of the Executive Directors are aligned with those of the shareholders.

For the LTIP, long term performance measures are chosen by the Remuneration Committee to provide a robust and transparent basis on which to measure Xaar's performance over the longer term and to provide alignment with Xaar's business strategy. EPS, Revenue growth and TSR are deemed to be the key measure of success of the execution of our long term strategy.

The Remuneration Committee retains the discretion to adjust the performance targets and measures where it considers it appropriate to do so (for example, to reflect changes in the structure of the business and to assess performance on a fair and consistent basis from year to year), and has exercised its discretion in this area of leaver provisions as described under Chief Financial Officer transition in the 2016 Annual Report.

Awards may be adjusted in the event of a variation of capital in accordance with the scheme rules.

GOVERNANCE continued

Directors' Remuneration report continued

Pay policy for other employees

The Company values its wider workforce and aims to provide a remuneration package that is market competitive, complies with any statutory requirements, and is applied fairly and equitably across the wider employee population. Where remuneration is not determined by statutory regulation, the key principles of the compensation philosophy are as follows:

- We remunerate people in a manner that allows for stability of the business and the opportunity for sustainable long term growth
- We seek to remunerate fairly and consistently for each role with due regard to the marketplace, internal consistency and the Company's ability to pay
- The Company operates HMRC approved SIP and SAYE and invites all employees to participate, therefore encouraging wider workforce share ownership.

Illustrations of application of remuneration policy

The charts below set out an illustration of the remuneration policy, in line with the policy above and include base salary, pension, benefits and incentives. The charts provide an illustration of the proportion of total remuneration made up of each component of the policy and the value of each component.

For these purposes base salary reflects the salary at 1 January 2019. Bonus is based on anticipated base salary as at 31 December 2019. Benefits are calculated as 21% for the Chief Executive Officer and 12% for the Chief Financial Officer of average salary for 2019. Pension is based on the policy set out in the policy table. LTIP awards are based on a base salary level at 1 January 2019, and are calculated as set out in the policy on pages 67 to 70.

Three scenarios have been illustrated for each Executive Director.

Minimum performance	• No bonus pay-out • No vesting under the LTIP.
Performance at mid point	• 62.5% of salary pay-out under the annual bonus for the CEO, 50% for the CFO • Shares equivalent to 75% of salary vesting under the LTIP for the CEO, 50% for the CFO.
Maximum performance	• 125% of salary pay-out under the annual bonus for the CEO, 100% for the CFO • Shares equivalent to 300% of salary vesting under the LTIP for the CEO, 150% for the CFO.

As required by the regulations, the scenarios do not include any share price growth assumptions or take into account any dividends that may be paid.

Chief Executive Officer – Doug Edwards, total remuneration £'000

Chief Financial Officer – Shomit Kenkare, total remuneration $'000

Approach to recruitment remuneration

When appointing a new Executive Director, whether with an internal or external candidate, the Remuneration Committee will typically seek to use the policy detailed in the table on pages 67 to 70 to determine the Executive Director's ongoing remuneration package.

To facilitate the appointment of candidates of the appropriate calibre required to implement the Group's strategy, the Remuneration Committee also retains the discretion to include any other remuneration component or award which is outside the policy. The Remuneration Committee does not intend to use this discretion to make a non-performance related incentive payment (for example, a 'golden hello'). In determining appropriate remuneration, the Remuneration Committee will take into consideration all relevant factors (including the quantum and nature of remuneration) to ensure that the arrangements are in the best interests of the Company and its shareholders. This may, for example, include (but is not limited to) the following circumstances:

- An interim appointment being made to fill an Executive Director role on a short term basis
- Exceptional circumstances require that the Chairman or a Non-Executive Director takes on an Executive function on a short term basis
- An Executive Director is recruited at a time in the year when it would be inappropriate to provide a bonus or long term incentive award for that year as there would not be sufficient time to assess performance. The quantum in respect of the months employed during the year may be transferred to the subsequent year so that reward is provided on a fair and appropriate basis
- The Executive received benefits at his previous employer which the Remuneration Committee considers it appropriate to offer.

The Remuneration Committee may also alter the performance measures, performance period and vesting period of the annual bonus or long term incentive, subject to the rules of the scheme, if the Remuneration Committee determines that the circumstances of the recruitment merit such alteration. The rationale will be clearly explained.

In determining appropriate remuneration arrangements on hiring a new Executive Director, the Remuneration Committee will take into account relevant factors such as the calibre of the individual, local market practice, the existing remuneration arrangements for other Executives and the business circumstances. It will seek to ensure that arrangements are in the best interests of both the Company and its shareholders and not seek to pay more than is appropriate.

The Remuneration Committee may make an award or payment to 'buy-out' remuneration arrangements forfeited on leaving a previous employer. In doing so the Remuneration Committee will take account of relevant factors regarding the forfeited arrangements which may include the form of any forfeited awards (e.g. cash or shares), any performance conditions attached to these awards (and the likelihood of meeting those conditions), and the time over which they would have vested. It will generally seek to structure buy-out awards and payments on a comparable basis to remuneration arrangements forfeited. These awards or payments are excluded from the maximum level of variable pay referred to below; however, the Remuneration Committee's intention is that the value awarded or paid would be no higher than the expected value of the forfeited arrangements.

Directors' Remuneration report continued

Appropriate costs and support will be covered if the recruitment requires the relocation of the individual. All buy-out awards and payments will normally be liable to forfeiture or 'clawback' on early departure. For Executive Directors, early departure is typically defined as being within the first two years of employment although the Remuneration Committee has the ability to amend this definition in appropriate circumstances.

The maximum level of variable pay which may be awarded to new Executive Directors, excluding buy-out arrangements, would normally be in line with the maximum level of variable pay that may be awarded under the annual bonus plan and LTIP, but in any event the Remuneration Committee would not make an award of annual variable pay above 425% of salary. The Remuneration Committee may determine that such awards will be forfeited if performance or continued employment conditions are not met and it is deemed appropriate to do so.

Any share awards referred to in this section will be granted as far as possible under the Company's existing share plans. If necessary, and subject to the limits referred to above, in order to facilitate the awards mentioned above, the Committee may rely on exemption 9.4.2. of the Listing Rules which allows for the grant of awards to facilitate, in exceptional circumstances, the recruitment of a Director.

Where a position is fulfilled internally, any ongoing remuneration obligations or outstanding variable pay elements shall be allowed to continue according to the original terms.

Fees payable to a newly-appointed Chairman or Non-Executive Director will be in line with the fee policy in place at the time of appointment.

Service contracts

Executive Directors

It is the Group's policy that Executive Directors should have contracts with an indefinite term, providing for one year's notice.

	Date of contract	Date of appointment	Notice from the Company	Notice from Director
Doug Edwards	5 January 2015	5 January 2015	12 months	12 months
Shomit Kenkare	15 November 2018	15 November 2018	12 months	12 months

Non-Executive Directors

All Non-Executive Directors are appointed for an initial three year term with provision for two further three year terms, subject to satisfactory performance.

	Date of letter of appointment[1]	Date of appointment	Unexpired term of contract on 31 December 2018
Robin Williams (Chairman)	27 September 2016	1 October 2016	9 months
Margaret Rice-Jones	3 June 2015	1 August 2015	29 months
Chris Morgan	2 December 2015	4 January 2016	36 months
Andrew Herbert	15 April 2016	1 June 2016	6 months

1 The dates above refer to the dates of the latest service agreements for each of the Non-Executive Directors.

Robin Williams has served as Chairman for two years and five months, having previously been a Non-Executive Director of Xaar since 2010. The Board notes the guidance from the recent revisions to the Governance code. Especially in the light of the strategic review his length of tenure as Chairman will be determined by the succession cycle of the executive Board, but in light of his length of service on the Board, he would not expect to serve more than two three year terms of appointment as Chairman. Mr Williams has provided assurance to the Board that he has more than adequate time to devote to his role at Xaar.

All Directors offer themselves for annual re-election at each AGM in accordance with the UK Corporate Governance Code. Letters of appointment are available for inspection at the registered office address of the Company.

Payments for loss of office

The principles on which the determination of payments for loss of office will be approached is set out below. Where the Remuneration Committee retains discretion, as outlined below, it will be used to provide flexibility in certain situations, taking into account the particular circumstance of the Director's departure and recent performance of the Company.

Notice period on termination by employing company	12 months. The Committee has the discretion to determine what proportion of the notice period will be utilised in active service.
Termination payment	Severance payments are limited to no more than one year's salary plus benefits in kind (including company car or car allowance and private health insurance) and pension contributions (which may include salary supplements). Benefits provided in connection with termination of employment may also include, but are not limited to, outplacement and legal fees.

	Reason for cessation	**Calculation of vesting/payment**	**Timing of vesting**
Annual bonus	Termination with cause.	No bonus paid.	Not applicable.
	Resignation or retirement.	No bonus is normally paid unless the Committee in its absolute discretion (and on a case-by-case basis) determines otherwise.	Normal payment date.
	Redundancy, disability, illness, injury, death or any other reason as determined by the Remuneration Committee.	Typically bonus amounts will be determined by reference to the applicable performance targets, pro-rated for time served in relation to the performance period.	Normal payment date unless Remuneration Committee decides it should be earlier.
LTIP	Termination with cause.	Lapse.	Not applicable.
	Resignation or retirement.	Normally lapse but with Remuneration Committee discretion to determine otherwise.	Normal vesting date.
	Redundancy, disability, illness, injury, death or any other reason as determined by the Remuneration Committee.	Pro rated to proportion of period worked during vesting period. Remuneration Committee can decide not to pro rate.	Normal vesting unless Remuneration Committee decides it should be at cessation of employment.
	Death.	Discretion to disapply performance conditions.	Date of cessation – unless Remuneration Committee decides normal vesting date.
SIP and SAYE	Governed by the HMRC approved plan rules and which cover certain leaver provisions.		

GOVERNANCE continued

Directors' Remuneration report continued

Non-Executive Directors

Under the terms of their engagement, the notice period to be given by the Non-Executive Directors on the Company is six months and the Company is obliged to give the same length of notice. Discretion is retained to terminate with or without due notice or paying any payment in lieu of notice dependent on what is considered to be in the best interests of the Company in the particular circumstances.

Statement of consideration of employment conditions elsewhere in the Company

Salary, benefits and performance related reward provided to employees is taken into account when setting policy for Executive Directors' remuneration (although employees are not formally consulted in relation to the setting of the policy). This includes consideration of:

- Salary increases for the general employee population
- Company-wide benefit (including pension) offerings
- Overall spend and participation levels in the annual bonus and LTIP
- Relevant ad-hoc information.

Existing contractual arrangements

The Remuneration Committee reserves the right to make any remuneration payments and payments for loss of office notwithstanding that they are not in line with the policy set out below where the terms of the payment were agreed:

(i) before the policy came into effect, or
(ii) at a time when the relevant individual was not a Director of the Company and, in the opinion of the Remuneration Committee, the payment was not in consideration for the individual becoming a Director of the Company.

For these purposes 'payments' includes the Remuneration Committee satisfying awards of variable remuneration and, in relation to an award over shares, the terms of the payment are 'agreed' at the time the award is granted.

The Remuneration Committee may make minor changes to this policy, which do not have a material advantage to Directors, to aid in its operation or implementation without seeking shareholder approval but taking into account the interests of shareholders.

Statement of consideration of shareholder views

In the interests of ensuring ongoing and transparent dialogue with shareholders, the Remuneration Committee consulted major shareholders over its base salaries and proposed new three year policy outlined in this report.

Approval

This report was approved by the Board on 21 March 2019 and signed on its behalf by:

Margaret Rice-Jones
Remuneration Committee Chair

Directors' responsibilities statement

The Directors are responsible for preparing the Annual Report and the Financial Statements in accordance with applicable law and regulations.

Company law requires the Directors to prepare financial statements for each financial year. Under that law the Directors are required to prepare the Group financial statements in accordance with International Financial Reporting Standards ('IFRSs') as adopted by the European Union and Article 4 of the IAS Regulation and have also chosen to prepare the parent Company financial statements in accordance with Financial Reporting Standard 101 Reduced Disclosure Framework. Under Company law the Directors must not approve the accounts unless they are satisfied that they give a true and fair view of the state of affairs of the Company and of the profit or loss of the Company for that period.

In preparing the parent Company financial statements, the Directors are required to:

- Select suitable accounting policies and then apply them consistently
- Make judgements and accounting estimates that are reasonable and prudent
- State whether applicable UK Accounting Standards have been followed, subject to any material departures disclosed and explained in the financial statements
- Prepare the financial statements on the going concern basis unless it is inappropriate to presume that the Company will continue in business.

In preparing the Group financial statements, International Accounting Standard 1 requires that Directors:

- Properly select and apply accounting policies
- Present information, including accounting policies, in a manner that provides relevant, reliable, comparable and understandable information
- Provide additional disclosures when compliance with the specific requirements in IFRSs are insufficient to enable users to understand the impact of particular transactions, other events and conditions on the entity's financial position and financial performance
- Make an assessment of the Company's ability to continue as a going concern.

The Directors are responsible for keeping adequate accounting records that are sufficient to show and explain the Company's transactions and disclose with reasonable accuracy at any time the financial position of the Company and enable them to ensure that the financial statements comply with the Companies Act 2006. They are also responsible for safeguarding the assets of the Company and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

The Directors are responsible for the maintenance and integrity of the corporate and financial information included on the Company's website. Legislation in the United Kingdom governing the preparation and dissemination of financial statements may differ from legislation in other jurisdictions.

Responsibility statement

We confirm that to the best of our knowledge:

- The financial statements, prepared in accordance with the relevant financial reporting framework, give a true and fair view of the assets, liabilities, financial position and profit or loss of the Company and the undertakings included in the consolidation taken as a whole
- The Strategic Report includes a fair review of the development and performance of the business and the position of the Company and the undertakings included in the consolidation taken as a whole, together with a description of the principal risks and uncertainties that they face
- The Annual Report and Financial Statements, taken as a whole, are fair, balanced and understandable and provide the information necessary for shareholders to assess the Company's performance, business model and strategy.

This responsibility statement was approved by the Board of Directors and is signed on its behalf by:

Doug Edwards
Chief Executive Officer

Shomit Kenkare
Chief Financial Officer

21 March 2019

INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF XAAR PLC

Report on the audit of the financial statements

Opinion

In our opinion:
- the financial statements of Xaar plc (the 'parent Company') and its subsidiaries (the 'Group') give a true and fair view of the state of the Group's and of the parent Company's affairs as at 31 December 2018 and of the Group's loss for the year then ended;
- the Group financial statements have been properly prepared in accordance with International Financial Reporting Standards (IFRSs) as adopted by the European Union;
- the parent Company financial statements have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice, including Financial Reporting Standard 101 "Reduced Disclosure Framework"; and
- the financial statements have been prepared in accordance with the requirements of the Companies Act 2006 and, as regards the Group financial statements, Article 4 of the IAS Regulation.

We have audited the financial statements which comprise:
- the Consolidated Income Statement;
- the Consolidated Statement of Comprehensive Income;
- the Consolidated Statement of Financial Position;
- the Consolidated Statement of Changes in Equity;
- the Consolidated Cash Flow Statement;
- the related Consolidated notes 1 to 35;
- the Company Balance Sheet;
- the Company Statement of Changes in Equity; and
- the related Parent Company notes 1 to 9.

The financial reporting framework that has been applied in the preparation of the Group financial statements is applicable law and IFRSs as adopted by the European Union. The financial reporting framework that has been applied in the preparation of the parent Company financial statements is applicable law and United Kingdom Accounting Standards, including FRS 101 "Reduced Disclosure Framework" (United Kingdom Generally Accepted Accounting Practice).

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (UK) (ISAs (UK)) and applicable law. Our responsibilities under those standards are further described in the auditor's responsibilities for the audit of the financial statements section of our report.

We are independent of the Group and the parent Company in accordance with the ethical requirements that are relevant to our audit of the financial statements in the UK, including the Financial Reporting Council's (the 'FRC's') Ethical Standard as applied to listed public interest entities, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We confirm that the non-audit services prohibited by the FRC's Ethical Standard were not provided to the Group or the parent Company.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Summary of our audit approach

Key audit matters

The key audit matters that we identified in the current year were:

- Recoverability of receivables
- Valuation of inventory
- Capitalisation of internally generated intangible assets
- Impairment of internally generated intangible assets
- Manual adjustments to revenue

Within this report, any new key audit matters are identified with ⊙ and any key audit matters which are the same as the prior year identified with ⊙.

Materiality

The materiality that we used for the Group financial statements was £0.8 million which was determined based on a blended measure using a combination of profit, revenue and asset benchmarks.

Scoping

The scope of our audit was driven by our risk assessment and understanding of the business. This consisted of eight components subjected to full scope audits, one component subjected to a review and five components subject to analytical procedures at the Group level.

Summary of our audit approach continued

Significant changes in our approach	In the current year we have identified a number of new key audit matters in respect of recoverability of receivables, manual adjustments to revenue and impairment of internally generated intangible assets. The key audit matter identified in respect of manual adjustments to revenue replaces our previously identified significant risk in respect of revenue recognition relating to customer rebates. In the current year no material commercial income arrangements have been entered into. In addition to the above new key audit matters identified, we broadened our key audit matter relating to the valuation of inventory to consider all inventory rather than just new inventory. There have been no other significant changes in our approach in the current year.

Conclusions relating to principal risks, going concern and viability statement

Going concern	We have reviewed the Directors' statement in note 3 to the financial statements about whether they considered it appropriate to adopt the going concern basis of accounting in preparing them and their identification of any material uncertainties to the Group's and Company's ability to continue to do so over a period of at least twelve months from the date of approval of the financial statements. We considered as part of our risk assessment the nature of the Group, its business model and related risks including where relevant the impact of Brexit, the requirements of the applicable financial reporting framework and the system of internal control. We evaluated the Directors' assessment of the Group's ability to continue as a going concern, including challenging the underlying data and key assumptions used to make the assessment, and evaluated the Directors' plans for future actions in relation to their going concern assessment. We are required to state whether we have anything material to add or draw attention to in relation to that statement required by Listing Rule 9.8.6R(3) and report if the statement is materially inconsistent with our knowledge obtained in the audit.	We confirm that we have nothing material to report, add or draw attention to in respect of these matters.
Principal risks and viability statement	Based solely on reading the Directors' statements and considering whether they were consistent with the knowledge we obtained in the course of the audit, including the knowledge obtained in the evaluation of the Directors' assessment of the Group's and the Company's ability to continue as a going concern, we are required to state whether we have anything material to add or draw attention to in relation to: • the disclosures on pages 29 to 33 that describe the principal risks and explain how they are being managed or mitigated; • the Directors' confirmation on page 46 that they have carried out a robust assessment of the principal risks facing the Group, including those that would threaten its business model, future performance, solvency or liquidity; or • the Directors' explanation on page 46 as to how they have assessed the prospects of the Group, over what period they have done so and why they consider that period to be appropriate, and their statement as to whether they have a reasonable expectation that the Group will be able to continue in operation and meet its liabilities as they fall due over the period of their assessment, including any related disclosures drawing attention to any necessary qualifications or assumptions. We are also required to report whether the Directors' statement relating to the prospects of the Group required by Listing Rule 9.8.6R(3) is materially inconsistent with our knowledge obtained in the audit.	We confirm that we have nothing material to report, add or draw attention to in respect of these matters.

INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF XAAR PLC continued

Key audit matters

Key audit matters are those matters that, in our professional judgement, were of most significance in our audit of the financial statements of the current period and include the most significant assessed risks of material misstatement (whether or not due to fraud) that we identified. These matters included those which had the greatest effect on: the overall audit strategy, the allocation of resources in the audit; and directing the efforts of the engagement team.

These matters were addressed in the context of our audit of the financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Recoverability of receivables	**Our response and observation**
Key audit matter description	The Group has a significant gross trade receivables balance at 31 December 2018 of £23.8 million (2017: £25.7 million). In 2017 the Group, for commercial reasons, started selling on extended credit terms to some of its customers and in the current year management have provided for £5.2 million (2017: £0.5 million) of the total year end receivables balance. We have identified a key audit matter in respect of recoverability of the amounts due from such customers. This is due to the degree of judgement and estimation in determining the recoverability of these trade receivables and providing for them in accordance with IFRS 9. The accounting policy is disclosed in note 3 to the financial statements. Note 2 to the financial statements provides details of the critical accounting judgements and page 52 provides the Audit Committee's discussion on recoverability of receivables.
How the scope of our audit responded to the key audit matter	We reviewed management's accounting treatment of the provision made against trade receivables in the current year, to assess whether the methodology used is in line with the requirements of IFRS 9. We requested confirmations of debtor balances from significant customers with extended credit terms. We also traced a sample of debtors to cash received post-year end from the customers and assessed whether the cash receipts were in line with payment plan terms where such terms had been agreed. We challenged the assumptions made by management in determining the provision for doubtful debts, taking into consideration the procedures performed above and also considering publicly available information in respect of the customers. In addition we held discussions with senior operational management to understand the relationship with these customers and corroborate management's position in respect of the bad debt provision.
Key observations	Based on the audit procedures performed and the facts and circumstances at the date of our audit report, we consider the judgements applied by management are materially reasonable. Due to the nature of the balance and associated uncertainties there is residual recoverability risk and the debtor amounts that might be realised may differ significantly from the current value recognised in the financial statements. Management have highlighted the key sources of estimation uncertainty in respect of the recoverability of receivables in note 2 of the financial statements.

Valuation of inventory	**Our response and observation**
Key audit matter description	The Group's inventory balance at 31 December 2018 is £32.1 million (2017: £19.1 million). In the current year management provided for £3.3 million (2017: £1.8 million) of the Group inventory balance. The Group has experienced a challenging trading environment and there can be long lead times before a new product is integrated into its target market. This increases risk of stock obsolescence and we therefore considered there to be a key audit matter in respect of the valuation of inventory. This is due to the degree of judgement and estimation involved in stating inventory at the lower of cost and net realisable value and the estimation involved in the assumptions used by management such as absorption rates used to calculate a new product's operating standard cost in line with IAS 2. The accounting policy is disclosed in note 3 to the financial statements. Note 2 to the financial statements provides details of the critical accounting judgements and page 52 provides the Audit Committee's discussion on inventory valuation.

Recoverability of receivables	**Our response and observation**
How the scope of our audit responded to the key audit matter	We assessed management's inventory valuation method by challenging the assumptions used in the derivation of the absorption rates, such as the normal level of production outputs by considering yields and the costs that are required to be absorbed into inventory considering those that had and had not been absorbed to ensure the methodology used is in line with the requirements of IAS 2. We sampled post year end sale values and compared against the book value at year end, to test that the book value did not exceed the realisable value. Where the sale value was lower than the book value, we considered the implications for further provisioning against relevant product lines. We performed testing over the assumptions used by management in the derivation of the absorption rates for a sample of new product lines. This included assessing inputs such as the type of costs being absorbed and normal level of production outputs and their compliance with the requirements of IAS 2. We also re-calculated the direct labour cost absorption per unit and the overhead absorption rate used for each new inventory line. We performed analysis on inventory holdings and where significant volumes of inventory were on hand for any particular product we challenged management on the risk of obsolescence. As part of this we obtained customer purchase orders to support management's position. In addition to the above audit procedures we held discussions with a number of employees external to finance including senior operational and marketing management to assess the feasibility of management's plans to realise product sales to new customers and markets.
Key observations	Based on the audit procedures performed and the facts and circumstances at the date of our audit report, we consider the judgements applied by management are materially reasonable. Management's ability to realise the book value of inventory is dependent on the successful execution of the Group's sales and marketing plans and uncertainty arises from the challenging trading environment. Management have highlighted the key sources of estimation uncertainty in respect of the valuation of inventory in note 2 of the financial statements.

Capitalisation of internally generated intangible assets	**Our response and observation**
Key audit matter description	The Group incurred £15.0 million on research and development costs in the year ended 31 December 2018, excluding amortisation on internally generated research and development, (2017: £18.1 million), representing a decrease of 17% from 2017. Xaar management has concluded that there is one development project meeting the capitalisation criteria in IAS 38 "Intangible Assets" (IAS 38) in the current year known as Project Venice. The product began being capitalised in the prior year, development costs that have been capitalised during the year were £1.9 million (2017: £0.9 million). Because of the judgements applied in determining whether a product is technically feasible and commercially viable and the complexity of the criteria applied, we consider there to be a key audit matter in relation to development costs being incorrectly accounted for (i.e. capitalised or expensed through the income statement). The accounting policy is disclosed in note 3 to the financial statements. The carrying values of the capitalised development costs are disclosed in note 14 to the financial statements. Note 2 to the financial statements provides details of the critical accounting judgements and page 52 provides the Audit Committee's discussion on capitalisation of internally generated intangible assets.

INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF XAAR PLC continued

Capitalisation of internally generated intangible assets

Our response and observation

How the scope of our audit responded to the key audit matter

We audited management's accounting treatment of development costs by testing a sample of research and development (R&D) project costs to supporting documentation, to assess whether they are accurate and appropriately classified. We discussed Project Venice and other R&D, with R&D and operational management, in order for us to assess whether Project Venice continues to meet the development criteria during the year and therefore should continue to be capitalised. We obtained supporting evidence, as described below, to assess whether technical feasibility and commercial viability has continued to be demonstrated and supported throughout the year. We also considered whether any other projects have reached the development phase and therefore require capitalisation.

For the project capitalised in the year we made an assessment of the technical feasibility and likelihood of future economic benefit by reference to product test stage classifications, management's project appraisals, agreements entered into with partners and feedback from partners.

Research and development costs capitalised and expensed

We obtained revenue and contribution forecasts for the capitalised development projects and closely examined management estimates included in the forecast with references to industry statistics and historic performance of the Group's other products. Net present value of the forecast contribution was also compared to the carrying value of the capitalised development costs.

Key observations

Based on the audit procedures performed, we concur that management has appropriately applied the principles of IAS 38.

Impairment of internally generated intangible assets

Our response and observation

Key audit matter description

The Group has internally generated intangible assets relating to a technology product platform which stopped being capitalised in July 2017 and began being amortised in August 2017. The net book value of this intangible asset at 31 December 2018 was £29.2 million (2017: £30.9 million).

Judgement is required by management in determining whether any of the assets should be impaired based on the future cash flows expected to be generated by the asset. This assessment takes into consideration a range of factors such as the trading performance and discount rates. Due to the challenging trading environment generally and matters specific to the Group's product development pipeline, we have identified a key audit matter in respect of the impairment of the internally generated intangible assets in respect of the platform. Our key audit matter focuses on the revenue growth assumptions.

The accounting policy is disclosed in note 3 to the financial statements. The carrying value of the capitalised internally generated intangible asset is disclosed in note 14 to the financial statements.

Note 2 to the financial statements provides details of the critical accounting judgements and page 52 provides the Audit Committee's discussion on impairment of internally generated intangible assets.

Impairment of internally generated intangible assets	**Our response and observation**
How the scope of our audit responded to the key audit matter	We assessed the compliance of management's discounted cash flows in accordance with IAS 36 ensuring the period covered by the budget was reasonable. We audited management's inputs and challenged the revenue growth assumptions made in the discounted cash flow forecast model prepared to support the carrying value of the intangible asset. We obtained and evaluated management's assumptions regarding revenue growth and future cashflows by reference to corroborative documentation, including customer purchase orders and licence agreements, as well as available contradictory evidence. We utilised our valuation specialists to review the discount factor used by management in the discounted cash flows. In addition to the above procedures performed, we held discussions with a number of people external to finance including senior operational and marketing management to further substantiate management's assumptions. We performed sensitivity analysis on management's cash flows taking into consideration a number of different scenarios such as revenue and margin reductions.
Key observations	Based on the audit procedures performed, we concur that management has appropriately applied the principles of IAS 36. Management's assessment of the recoverability of the net book value of the technology is dependent on the successful execution of the Group's sales and marketing plans and uncertainty arises from the challenging trading environment. Management have highlighted the key sources of estimation uncertainty in respect of the impairment of internally generated intangible assets in note 2 of the financial statements.

Manual adjustments to revenue	**Our response and observation**
Key audit matter description	The printhead segment of the business manufactures and sells printheads to distributors and Original Equipment Manufacturers (OEMs). In the current year this segment generated £49.8 million (2017: £86.1 million) of revenue. In accordance with IFRS 15, revenue is recognised on printheads when control of the goods is transferred. In some instances, based on the facts and circumstances relating to the sale, manual adjustments are required to reflect the actual transaction that has taken place and to ensure revenue has been recognised in the correct period. There is a risk that manual adjustments are made to revenue incorrectly. Considering this, and due to the challenging trading environment generally and matters specific to the Group's product development pipeline, we have identified a key audit matter in respect of manual adjustments to revenue. The accounting policy is disclosed in note 3 to the financial statements. Page 52 provides the Audit Committee's discussion on revenue recognition.
How the scope of our audit responded to the key audit matter	We tested manual adjustments made pre-year end and credit notes issued post year end. For all samples selected we obtained supporting documentation to support the manual adjustment made or credit note raised and assessed whether revenue had been recognised in the correct financial year and in accordance with IFRS 15.
Key observations	Based on the audit procedures performed, we concur that all manual adjustments to revenue have appropriate business rationale.

Our application of materiality

We define materiality as the magnitude of misstatement in the financial statements that makes it probable that the economic decisions of a reasonably knowledgeable person would be changed or influenced. We use materiality both in planning the scope of our audit work and in evaluating the results of our work.

Based on our professional judgement, we determined materiality for the financial statements as a whole as follows:

	Group financial statements	**Company financial statements**
Materiality	£0.8 million (2017: £0.9 million)	£0.5 million (2017: £0.7 million)
Basis for determining materiality	We considered asset, revenue and profit bases in the determination of materiality.	We determine materiality based on 0.7% (2017: 0.5%) of net assets.

INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF XAAR PLC continued

	Group financial statements	Company financial statements
Rationale for the benchmark applied	In addition to a profit-based metric, we incorporated net assets and revenue measures in determining materiality to reflect the significant levels of capitalised research and development costs incurred in recent years and the loss generated in the current year. Materiality equates to 0.6% (2017: 0.6%) of net assets and 5.4% (2017: 7.5%) of pre-tax (loss)/ profit.	Net assets is considered the most appropriate benchmark as it is the key performance metric for users of the financial statements for Xaar plc Company only. Materiality has been capped at £0.5 million for the purpose of the Group audit.

We agreed with the Audit Committee that we would report to the Committee all audit differences in excess of £0.04 million (2017: £0.05 million), as well as differences below that threshold that, in our view, warranted reporting on qualitative grounds. We also report to the Audit Committee on disclosure matters that we identified when assessing the overall presentation of the financial statements.

An overview of the scope of our audit

Our Group audit was scoped by obtaining an understanding of the Group and its environment, including Group-wide controls, and assessing the risks of material misstatement at the Group level.

Based on that assessment, we focussed our Group audit scope primarily on the audit work at the UK headquarters in Cambridge and the Group's operations in America. Eight (2017: five) components were subject to a full scope audit by the Group audit team: Xaar plc, XaarJet Limited, Xaar Technology Limited, XaarJet (Overseas) Limited, Xaar Digital Limited, Xaar 3D Holdings Limited, Xaar 3D Limited, EPS (Engineered Printing Solutions Inc.). In the prior year EPS was subject to specified audit procedures where the extent of our testing was based on our assessment of the risks of material misstatement and of the materiality of the Group's operations at that component. One (2017: none) component (Xaar 3D ApS) was subject to a review at the component level using component materiality based on our assessment of the materiality of the Group's operations at that component. Five components (2017: six) were subject to a review at the Group level based on our assessment of the materiality of the Group's operations at that component. All components where our Group audit was focussed were audited by the Group team.

The eight components subject to a full audit account for 97% (2017: 93%) of the Group's revenue, 93% (2017: 93%) of the Group's (loss)/profit before tax and 85% (2017: 96%) of the Group's net assets. Our audit work for each component was executed at levels of materiality applicable to each individual component which were lower than Group materiality. The component materiality ranges between £0.2 million to £0.8 million (2017: £0.2 million to £0.8 million).

At the parent entity level we also tested the consolidation process and carried out analytical procedures to confirm our conclusion that there were no significant risks of material misstatement of the aggregated financial information of the remaining components not subject to audit or audit of specified account balances.

Other information

We have nothing to report in respect of these matters.

The Directors are responsible for the other information. The other information comprises the information included in the annual report, other than the financial statements and our auditor's report thereon.

Our opinion on the financial statements does not cover the other information and, except to the extent otherwise explicitly stated in our report, we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit or otherwise appears to be materially misstated.

If we identify such material inconsistencies or apparent material misstatements, we are required to determine whether there is a material misstatement in the financial statements or a material misstatement of the other information. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact.

In this context, matters that we are specifically required to report to you as uncorrected material misstatements of the other information include where we conclude that:

- Fair, balanced and understandable – the statement given by the directors that they consider the annual report and financial statements taken as a whole is fair, balanced and understandable and provides the information necessary for shareholders to assess the Group's position and performance, business model and strategy, is materially inconsistent with our knowledge obtained in the audit; or
- Audit Committee reporting – the section describing the work of the Audit Committee does not appropriately address matters communicated by us to the Audit Committee; or
- Directors' statement of compliance with the UK Corporate Governance Code – the parts of the directors' statement required under the Listing Rules relating to the Company's compliance with the UK Corporate Governance Code containing provisions specified for review by the auditor in accordance with Listing Rule 9.8.10R(2) do not properly disclose a departure from a relevant provision of the UK Corporate Governance Code.

Responsibilities of directors
As explained more fully in the Directors' responsibilities statement, the Directors are responsible for the preparation of the financial statements and for being satisfied that they give a true and fair view, and for such internal control as the directors determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Directors are responsible for assessing the Group's and the parent Company'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 the parent Company or to cease operations, or have no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial statements
Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

Details of the extent to which the audit was considered capable of detecting irregularities, including fraud are set out below.

A further description of our responsibilities for the audit of the financial statements is located on the FRC's website at: www.frc.org.uk/auditorsresponsibilities. This description forms part of our auditor's report.

Extent to which the audit was considered capable of detecting irregularities, including fraud
We identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and then design and perform audit procedures responsive to those risks, including obtaining audit evidence that is sufficient and appropriate to provide a basis for our opinion.

Identifying and assessing potential risks related to irregularities
In identifying and assessing risks of material misstatement in respect of irregularities, including fraud and non-compliance with laws and regulations, our procedures included the following:

- enquiring of management and the Audit Committee, including obtaining and reviewing supporting documentation, concerning the Group's policies and procedures relating to:
  - identifying, evaluating and complying with laws and regulations and whether they were aware of any instances of non-compliance;
  - detecting and responding to the risks of fraud and whether they have knowledge of any actual, suspected or alleged fraud;
  - the internal controls established to mitigate risks related to fraud or non-compliance with laws and regulations;
- discussing among the engagement team and involving relevant internal specialists, including tax, valuations and IT, regarding how and where fraud might occur in the financial statements and any potential indicators of fraud. As part of this discussion, we identified potential for fraud in the following areas: inventory valuation, manual adjustments to revenue, receivables recoverability and impairment of internally generated intangible assets; and
- obtaining an understanding of the legal and regulatory frameworks that the Group operates in, focusing on those laws and regulations that had a direct effect on the financial statements or that had a fundamental effect on the operations of the Group. The key laws and regulations we considered in this context included the UK Companies Act, Listing Rules and tax legislation.

Audit response to risks identified
As a result of performing the above, we identified manual adjustments to revenue as a key audit matter. The key audit matters section of our report explains the matter in more detail and also describes the specific procedures we performed in response to that key audit matter.

In addition to the above, our procedures to respond to risks identified included the following:

- *reviewing the financial statement disclosures and testing to supporting documentation to assess compliance with relevant laws and regulations* discussed above;
- enquiring of management, the Audit Committee and external legal counsel concerning actual and potential litigation and claims;
- performing analytical procedures to identify any unusual or unexpected relationships that may indicate risks of material misstatement due to fraud;
- reading minutes of meetings of those charged with governance, reviewing internal audit reports and reviewing correspondence with HMRC; and
- in addressing the risk of fraud through management override of controls, testing the appropriateness of journal entries and other adjustments; assessing whether the judgements made in making accounting estimates are indicative of a potential bias; and evaluating the business rationale of any significant transactions that are unusual or outside the normal course of business.

We also communicated relevant identified laws and regulations and potential fraud risks to all engagement team members including internal specialists, and remained alert to any indications of fraud or non-compliance with laws and regulations throughout the audit.

INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF XAAR PLC continued

Report on other legal and regulatory requirements

Opinions on other matters prescribed by the Companies Act 2006

In our opinion the part of the Directors' remuneration report to be audited has been properly prepared in accordance with the Companies Act 2006.

In our opinion, based on the work undertaken in the course of the audit:

- the information given in the strategic report and the Directors' report for the financial year for which the financial statements are prepared is consistent with the financial statements; and
- the strategic report and the Directors' report have been prepared in accordance with applicable legal requirements.

In the light of the knowledge and understanding of the Group and of the parent Company and their environment obtained in the course of the audit, we have not identified any material misstatements in the strategic report or the Directors' report.

Matters on which we are required to report by exception

Adequacy of explanations received and accounting records Under the Companies Act 2006 we are required to report to you if, in our opinion: • we have not received all the information and explanations we require for our audit; or • adequate accounting records have not been kept by the parent Company, or returns adequate for our audit have not been received from branches not visited by us; or • the parent Company financial statements are not in agreement with the accounting records and returns.	**We have nothing to report in respect of these matters.**
Directors' remuneration Under the Companies Act 2006 we are also required to report if in our opinion certain disclosures of directors' remuneration have not been made or the part of the Directors' remuneration report to be audited is not in agreement with the accounting records and returns.	**We have nothing to report in respect of these matters.**

Other matters

Auditor tenure

Following the recommendation of the Audit Committee, we were appointed by the Board of Directors of Xaar plc on 24 July 2009 to audit the financial statements for the year ending 31 December 2009 and subsequent financial periods. The period of total uninterrupted engagement including previous renewals and reappointments of the firm is 10 years, covering the years ending 2009 to 2018.

Consistency of the audit report with the additional report to the Audit Committee

Our audit opinion is consistent with the additional report to the Audit Committee we are required to provide in accordance with ISAs (UK).

Use of our report

This report is made solely to the Company's members, as a body, in accordance with Chapter 3 of Part 16 of the Companies Act 2006. Our audit work has been undertaken so that we might state to the Company's members those matters we are required to state to them in an auditor's report and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the Company and the Company's members as a body, for our audit work, for this report, or for the opinions we have formed.

Paul Schofield

Paul Schofield FCA (Senior statutory auditor)
For and on behalf of Deloitte LLP
Statutory Auditor
Cambridge, United Kingdom
21 March 2019

CONSOLIDATED INCOME STATEMENT
for the year ended 31 December 2018

	Notes	2018 £'000	2017 £'000
Revenue	5	**63,534**	100,142
Cost of sales		**(39,085)**	(53,097)
Gross profit		**24,449**	47,045
Research and development expenses		**(14,682)**	(12,318)
Research and development expenditure credit		**1,737**	411
Sales and marketing expenses		**(9,071)**	(7,860)
General and administrative expenses		**(7,512)**	(12,610)
Impairment losses on financial assets		**(4,681)**	(17)
Restructuring and investment expenses		**(5,337)**	(2,553)
Operating (loss)/profit		**(15,097)**	12,098
Investment income	9	**170**	192
(Loss)/profit before tax		**(14,927)**	12,290
Tax	10	**2,589**	(1,358)
(Loss)/profit for the year		**(12,338)**	10,932
Attributable to:			
Owners of the Company		**(12,276)**	10,932
Non-controlling interest		**(62)**	–
(Loss)/profit for the year		**(12,338)**	10,932
Earnings per share			
Basic	12	**(16.0p)**	14.3p
Diluted	12	**(16.0p)**	14.0p

Dividends paid in the year amounted to £6,009,000 (2017: £7,728,000). Further disclosures are given in note 11.

All activities relate to continuing operations.

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME
for the year ended 31 December 2018

	Notes	2018 £'000	2017 £'000
(Loss)/profit for the year attributable to shareholders		**(12,338)**	10,932
Items that may be reclassified subsequently to profit or loss:			
Exchange differences on retranslation of net investment	28/29	**202**	(721)
Tax charge on share option	10	**(41)**	(20)
Other comprehensive income/(loss) for the year		**161**	(741)
Total comprehensive (loss)/income for the year		**(12,177)**	10,191
Total comprehensive (loss)/income attributable to:			
Owners of the Company		**(12,113)**	10,191
Non-controlling interests		**(64)**	–
		(12,177)	10,191

FINANCIAL STATEMENTS

CONSOLIDATED STATEMENT OF FINANCIAL POSITION
as at 31 December 2018

	Notes	2018 £'000	2017 £'000
Non-current assets			
Goodwill	13	**5,522**	5,212
Other intangible assets	14	**32,796**	32,678
Property, plant and equipment	15	**28,044**	33,471
Receivables	19	**–**	858
Current assets		**66,362**	72,219
Inventories	18	**32,142**	19,119
Trade and other receivables	19	**21,398**	30,303
Current tax asset	19	**5,142**	3,412
Treasury deposits	19	**3,277**	753
Cash and cash equivalents	19	**24,669**	43,944
		86,628	97,531
Total assets		**152,990**	169,750
Current liabilities			
Trade and other payables	22	**(18,958)**	(16,583)
Other financial liabilities	23	**(33)**	(30)
Provisions	24	**(499)**	(1,911)
Derivative financial instruments	20	**(643)**	–
		(20,133)	(18,524)
Net current assets		**66,495**	79,007
Non-current liabilities			
Deferred tax liabilities	21	**(870)**	(3,905)
Other financial liabilities	23	**(103)**	(137)
Total non-current liabilities		**(973)**	(4,042)
Total liabilities		**(21,106)**	(22,566)
Net assets		**131,884**	147,184
Equity			
Share capital	25	**7,833**	7,833
Share premium	26	**29,328**	29,317
Own shares	27	**(3,113)**	(3,642)
Other reserves	29	**15,144**	14,638
Translation reserve	28	**817**	613
Retained earnings	29	**79,675**	98,425
Equity attributable to owners of the Company		**129,684**	147,184
Non-controlling interest		**2,200**	–
Total equity		**131,884**	147,184

The financial statements of Xaar plc, registered number 3320972, were approved by the Board of Directors and authorised for issue on 21 March 2019.

They were signed on its behalf by:

Doug Edwards
Chief Executive Officer

Shomit Kenkare
Chief Financial Officer

CONSOLIDATED STATEMENT OF CHANGES IN EQUITY
for the year ended 31 December 2018

	Notes	Share capital £'000	Share premium £'000	Own shares £'000	Other reserves £'000	Translation reserve £'000	Retained earnings £'000	Total £'000	Non-controlling interest £'000	Total equity £'000
Balance at 1 January 2017		7,778	27,854	(3,642)	11,891	807	95,768	140,456	–	140,456
Profit for the year		–	–	–	–	–	10,932	10,932	–	10,932
Tax on items taken directly to equity		–	–	–	–	–	(20)	(20)	–	(20)
Exchange differences on retranslation of net investment		–	–	–	–	(194)	(527)	(721)	–	(721)
Total comprehensive income for the year		–	–	–	–	(194)	10,385	10,191	–	10,191
Issue of share capital		55	1,463	–	–	–	–	1,518	–	1,518
Dividends paid	11	–	–	–	–	–	(7,728)	(7,728)	–	(7,728)
Credit to equity for equity-settled share-based payments		–	–	–	2,747	–	–	2,747	–	2,747
Balance at 1 January 2018		**7,833**	**29,317**	**(3,642)**	**14,638**	**613**	**98,425**	**147,184**	**–**	**147,184**
Loss for the year		–	–	–	–	–	(12,276)	(12,276)	(62)	(12,338)
Tax on items taken directly to equity		–	–	–	–	–	(41)	(41)	–	(41)
Exchange differences on retranslation of net investment		–	–	–	–	204	–	204	(2)	202
Total comprehensive income for the year		–	–	–	–	204	(12,317)	(12,113)	(64)	(12,177)
Issue of share capital		–	11	–	–	–	–	11	–	11
Own shares sold in the year		–	–	529	–	–	(424)	105	–	105
Dividends paid	11	–	–	–	–	–	(6,009)	(6,009)	–	(6,009)
Credit to equity for equity-settled share-based payments		–	–	–	506	–	–	506	–	506
Adjustment arising from change in non-controlling interest		–	–	–	–	–	–	–	2,264	2,264
Balance at 31 December 2018		**7,833**	**29,328**	**(3,113)**	**15,144**	**817**	**79,675**	**129,684**	**2,200**	**131,884**

The nature of retained earnings and other reserves in equity are described in note 29.

FINANCIAL STATEMENTS

CONSOLIDATED CASH FLOW STATEMENT
for the year ended 31 December 2018

	Notes	2018 £'000	2017 £'000
Net cash from operating activities	30	**(9,862)**	12,473
Investing activities			
Investment income		**171**	190
Treasury amounts deposited		**(2,524)**	(753)
Redemption of investment		**–**	1,000
Purchases of property, plant and equipment		**(2,790)**	(5,517)
Proceeds on disposal of property, plant and equipment		**584**	–
Expenditure on software		**(160)**	(19)
Expenditure on licence		**(177)**	–
Expenditure on capitalised product development		**(1,915)**	(6,451)
Net cash used in investing activities		**(6,811)**	(11,551)
Financing activities			
Dividends paid		**(6,009)**	(7,728)
Proceeds from issue of financial instrument		**753**	–
Income from non-controlling interest		**2,264**	–
Proceeds from the sale of ordinary share capital		**105**	–
Proceeds from issue of ordinary share capital		**11**	1,518
Net cash used in financing activities		**(2,876)**	(6,210)
Net decrease in cash and cash equivalents		**(19,549)**	(5,287)
Effect of foreign exchange rate changes on cash balances		**274**	(90)
Cash and cash equivalents at beginning of year		**43,944**	49,321
Cash and cash equivalents at end of year		**24,669**	43,944

Cash and cash equivalents (which are presented as a single class of asset on the face of the consolidated statement of financial position) comprise cash at bank and other short term highly liquid investments with a maturity of three months or less. The carrying amount of these assets is approximately equal to their fair value.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
for the year ended 31 December 2018

1. General information
Xaar plc ('the Group') is incorporated in England and Wales under the Companies Act 2006. The address of the registered office is given on the inside back cover. The nature of the Group's operations and its principal activity is set out in the Strategic Report starting on page 1.

2. Key sources of estimation uncertainty and critical accounting judgements
The key assumptions concerning the future and other sources of estimation uncertainty at the date of the statement of financial position that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are as follows:

Inventory provision (estimation uncertainty)
The Group's inventory provision at 31 December 2018 includes £2,490,000 relating to slow moving finished goods. These provisions have been made based on management's assessment of customer sell through, market conditions, current and potential competitors, the ageing profile of the inventory and the volume of inventory on hand. Furthermore, management has assessed the likely time period to sell the inventory and the ability to decrease prices to drive sales.

Further information can be found on page 110 (note 18).

Credit provision for the allowance of doubtful debts (estimation uncertainty)
The Group's provision for doubtful debts of £5,178,000 relates to management's assessment of the ageing profile of receivables and the risk of collecting unpaid overdue balances. In making the estimate, management has taken steps to assess the ongoing viability of the customers, the probability and timing of repayment, external factors which may affect the customers' ability to pay and historical data relating to settlement of aged debts.

Further information can be found on page 111 (note 19).

Capitalisation of development costs (accounting judgement)
As described in note 3, the Group capitalises development expenditure as an intangible asset where the criteria under IAS 38 Intangible Assets is met. This requires management to make judgement on when all of the criteria for capitalisation are met and when to cease capitalisation and start amortising the asset. In 2018, total capitalised development expenditure amounted to £1,915,000 (2017: £6,451,000).

Impairment of Capitalised development costs (estimation uncertainty)
The Group determines whether capitalised development costs, and all other non-current assets, are impaired at least on an annual basis. This requires an estimation of the 'value-in-use' of the cash-generating units to which the capitalised development costs are allocated. Estimating a value-in-use amount requires management to make an estimate of the expected future cash flows from the cash-generating unit and also to choose a suitable discount rate in order to calculate the present value of those cash flows. The carrying amount of capitalised development costs at 31 December 2018 was £32,337,000 (2017: £32,491,000).

3. Significant accounting policies
Basis of accounting
The financial statements have been prepared in accordance with International Financial Reporting Standards (IFRS), as adopted for use in the European Union. Therefore the Group financial statements have been prepared in accordance with Article 4 of the EU IAS regulation.

The financial information has been prepared on the basis of all applicable IFRS, including all International Accounting Standards (IAS), Standing Interpretations Committee (SIC) interpretations and International Financial Reporting Interpretations Committee (IFRIC) interpretations issued by the International Accounting Standards Board (IASB) that are applicable to the financial period, as adopted by the European Union.

The financial statements have been prepared on the historical cost basis, except for the revaluation of financial instruments. The Group financial statements are presented in Sterling and all values are rounded to the nearest thousand pounds (£'000) except when otherwise indicated.

The principal accounting policies adopted are set out below.

Basis of consolidation
The consolidated financial statements incorporate the financial statements of the Company and entities controlled by the Company ('its subsidiaries') made up to 31 December each year. Control is achieved where the Company has the power to govern the financial and operating policies of an investee entity so as to obtain benefits from its activities.

The results of subsidiaries acquired or disposed of during the year are included in the consolidated income statement from the effective date of acquisition or up to the effective date of disposal, as appropriate. Where necessary, adjustments are made to the financial statements of subsidiaries to bring the accounting policies used in line with those used by the Group.

All intra-group transactions, balances, income and expenses are eliminated on consolidation. Foreign exchange gains and losses arising on the retranslation of trading balances with subsidiaries with different functional currencies are reported in the income statement.

Non-controlling interests in subsidiaries are identified separately from the Group's equity therein. Those interests of non-controlling shareholders that are present ownership interests entitling their holders to a proportionate share of net assets upon liquidation may initially be measured at fair value or at the non-controlling interests' proportionate share of the fair value of the acquiree's identifiable net assets. The choice of measurement is made on an acquisition-by-acquisition basis. Subsequent to acquisition, the carrying amount of non-controlling interests is the amount of those interests at initial recognition plus the non-controlling interests' share of subsequent changes in equity.

FINANCIAL STATEMENTS

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
for the year ended 31 December 2018

3. Significant accounting policies continued

Basis of consolidation continued

Profit or loss and each component of other comprehensive income are attributed to the owners of the Company and to the non-controlling interests. Total comprehensive income of subsidiaries is attributed to the owners of the Company and to the non-controlling interests even if this results in the non-controlling interests having a deficit balance.

Changes in the Group's interests in subsidiaries that do not result in a loss of control are accounted for as equity transactions. The carrying amount of the Group's interests and the non-controlling interests are adjusted to reflect the changes in their relative interests in the subsidiaries. Any difference between the amount by which the non-controlling interests are adjusted and the fair value of the consideration paid or received is recognised directly in equity and attributed to the owners of the Company.

Going concern

The Group's business activities, together with the factors likely to affect its future development, performance and position, are set out in the Strategic Report. Although there is still uncertainty surrounding the outcome of the UK exiting the EU, we do not expect the direct consequences to have a material impact on the Group, as discussed in our Chief Executive Officer's report and our Risk management section. Notes 19, 20 and 23 include a description of the Group's objectives; policies and processes for managing its capital; its financial risk management objectives; details of its financial instruments and hedging activities; and its exposure to credit risk and liquidity risk.

After making enquiries, the Directors have a reasonable expectation that the Group has adequate resources to continue in operational existence for the foreseeable future, based on the Group's forecasts and projections for the next 12 months, taking account of reasonably possible changes in trading performance. For this reason, we continue to adopt the going concern basis in preparing the financial statements.

Adjusted financial measures

Adjusted financial measures comprise adjusted operating profit/(loss) and margin, adjusted profit/(loss) before tax, adjusted profit/(loss) before tax excluding the impact of IAS 38 and adjusted diluted earnings per share. These measures are alternative performance measures (APMs) which are not defined or specified under the requirements of IFRS. These APMs adjust for recurring and non-recurring items which management consider to have a distorting effect on the underlying results of the Group. Items adjusted for include share-based payment charges, exchange differences on intra-group transactions, restructuring and investment expenses, gains and losses on derivative financial instruments and the research and development expenditure credit. Recurring items are adjusted each year irrespective of materiality to ensure consistent treatment. Net cash includes cash, cash equivalents and treasury deposits. Gross R&D investment includes the capitalised costs of the High Speed Sintering development programme (and P4 (Thin Film) technology platform in 2017), and excludes the amortisation cost of P4 (Thin Film) technology platform.

Business combinations

The acquisition of subsidiaries is accounted for using the acquisition method.

Goodwill arising on acquisition is recognised as an asset and initially measured at cost, being the excess of the sum of consideration transferred, the amount of any non-controlling interests in the acquiree over the net of the acquisition-date amounts of the identifiable assets, liabilities and contingent liabilities recognised. If after reassessment, the Group's interest in the net fair value of the acquiree's identifiable assets, liabilities and contingent liabilities exceeds the cost of the business combination, the excess is recognised immediately in the income statement.

Goodwill

Goodwill arising on consolidation is initially recognised as an asset at cost and is subsequently measured at cost less any accumulated impairment losses. Goodwill which is recognised as an asset is reviewed for impairment at least annually. Any impairment is recognised immediately in the income statement and is not subsequently reversed.

For the purposes of impairment testing, goodwill is allocated to each of the Group's cash-generating units expected to benefit from the synergies of the combination. Cash-generating units to which goodwill has been allocated are tested for impairment annually, or more frequently when there is an indication that the unit may be impaired. If the recoverable amount of the cash-generating unit is less than the carrying amount of the unit, the impairment loss is allocated first to reduce the carrying amount of any goodwill allocated to the unit and then to the other assets of the unit pro rata on the basis of the carrying amount of each asset in the unit.

On disposal of the cash-generating unit, the attributable amount of goodwill is included in the determination of the profit or loss on disposal.

Goodwill arising on acquisitions before the date of transition to IFRS has been retained at the previous UK GAAP amounts subject to being tested for impairment at that date. Goodwill written off to reserves under UK GAAP prior to 1998 has not been reinstated and is not included in determining any subsequent profit or loss on disposal.

Revenue recognition

Revenue is measured based on the consideration to which the Group expects to be entitled in a contract with a customer and excludes amounts collected on behalf of third parties. The Group recognises revenue when it transfers control of a product or service to a customer.

Revenue from goods and services is recognised in accordance with IFRS 15 when control has been transferred to the customer. For sale of goods and services revenue is recognised at a point in time, unless specific conditions have been satisfied allowing revenue to be recognised over a period of time.

Development fees gained from joint development agreements are treated as income over the periods necessary to match them with the related costs.

Funding received for internally generated intangible assets is recognised on a straight-line basis to match the amortisation period of the related intangible fixed asset.

Royalties are recognised on an accruals basis in accordance with the actual revenue trend in the most recent quarterly statements received from each licensee.

Interest income is accrued on a time basis, by reference to the principal outstanding and at the effective interest rate applicable, which is the rate that discounts estimated future cash receipts through the expected life of the financial asset to that asset's net carrying amount.

Printheads are sold to certain customers with volume discounts. Revenue from these sales is recorded based on the contracted price less the estimated volume discount based on the anticipated volume of sales.

3. Significant accounting policies continued

Leases

Rentals payable under operating leases are charged to income on a straight-line basis over the term of the relevant lease, except where another more systematic basis is more representative of the time pattern in which the economic benefits from the lease asset are consumed. Contingent rentals arising under operating leases are recognised as an expense in the period in which they are incurred.

In the event that lease incentives are received to enter into operating leases, such incentives are recognised as a liability. The aggregate benefit of incentives is recognised as a reduction of rental expense on a straight-line basis, except where another systematic basis is more representative of the time pattern in which economic benefits from the leased asset are consumed.

Foreign currencies

The individual financial statements of each Group Company are presented in the currency of the primary economic environment in which it operates (its functional currency). For the purpose of the consolidated financial statements, the results and financial position of each Group Company are expressed in Sterling, which is the functional currency of the Company and the presentation currency for the consolidated financial statements.

Exchange differences arising on the settlement of monetary assets and liabilities, and on the retranslation of monetary assets and liabilities, are included in the income statement for the period.

In order to hedge its exposure to certain foreign exchange risks, the Group may enter into forward contracts (see page 94 for details of the Group's accounting policies in respect of such derivative financial instruments).

For the purposes of presenting consolidated financial statements, the assets and liabilities of the Group's foreign operations are translated at the exchange rates prevailing on the date of the statement of financial position. Income and expense items are translated at the average exchange rates for the period.

Exchange differences arising are recognised in other comprehensive income and taken to the translation reserve. Exchange differences on the translation of net investments are taken to the translation reserve of the applicable entity.

Goodwill and fair value adjustments arising on the acquisition of a foreign entity are treated as assets and liabilities of the foreign entity and translated at the closing rate.

Government and EU grants

Government and EU grants are not recognised until there is reasonable assurance that the Group will comply with the conditions attached to them and that the grant will be received. Government and EU grants relating to research and development are treated as income over the periods necessary to match them with the related costs.

Operating profit/(loss)

Operating profit/(loss) is stated after charging restructuring costs but before investment income and finance costs.

Retirement benefit costs

Payments to defined contribution retirement benefit schemes are charged as an expense as they fall due. Payments made to state managed retirement benefit schemes are dealt with as payments to defined contribution schemes where the Group's obligations under the schemes are equivalent to those arising in a defined contribution retirement benefit scheme.

Taxation

The tax expense represents the sum of the tax currently payable and deferred tax, including UK corporation tax and foreign tax.

The tax currently payable is based on taxable profit for the year. Taxable profit differs from net profit as reported in the income statement because it excludes items of income or expense that are taxable or deductible in other years and it further excludes items that are never taxable or deductible. The Group's liability for current tax is calculated using tax rates that have been enacted or substantively enacted by date of the statement of financial position.

Deferred tax is the tax expected to be payable or recoverable on differences between the carrying amounts of assets and liabilities in the financial statements and the corresponding tax bases used in the computation of taxable profit and is accounted for using the statement of financial position liability method. Deferred tax liabilities are generally recognised for all taxable temporary differences and deferred tax assets are recognised to the extent that it is probable that taxable profits will be available against which deductible temporary differences can be utilised. Such assets and liabilities are not recognised if the temporary difference arises from the initial recognition of goodwill or from the initial recognition (other than in a business combination) of other assets and liabilities in a transaction that affects neither the tax profit nor the accounting profit.

Deferred tax liabilities are recognised for taxable temporary differences arising on investments in subsidiaries, except where the Group is able to control the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future.

The carrying amount of deferred tax assets is reviewed at the date of each statement of financial position and reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow all or part of the asset to be recovered.

Deferred tax is calculated at the tax rates that are expected to apply in the period when the liability is settled or the asset is realised. Deferred tax is charged or credited in the income statement, except when it relates to items charged or credited directly to equity, in which case the deferred tax is also dealt with in equity.

To the extent that the Group receives a tax deduction relating to share-based payment transactions, deferred tax is provided at the appropriate tax rate on the difference in value between the market price of the underlying equity as at the date of the financial statements and the exercise price of the outstanding share options. As a result, the deferred tax impact of share options will not be derived directly from the expense reported in the consolidated income statement. The amount by which the deductible difference exceeds the cumulative charge to the consolidated income statement is recorded in the consolidated statement of comprehensive income.

Deferred tax assets and liabilities are measured on an undiscounted basis and are offset when there is a legally enforceable right to set off current tax assets against current tax liabilities and when they relate to income taxes levied by the same taxation authority and the Group intends to settle its current tax assets and liabilities on a net basis.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
for the year ended 31 December 2018

3. Significant accounting policies continued

Property, plant and equipment

All property, plant and equipment is shown at original historical cost less accumulated depreciation and any recognised impairment loss.

Assets in the course of construction for production or administrative purposes are carried at cost, less any recognised impairment loss. Depreciation of these assets, on the same basis as other assets in the same class, commences when the assets are ready for their intended use.

Freehold land is not depreciated.

Depreciation is charged so as to write off the cost or valuation of assets, less their residual values, other than assets in the course of construction, over their estimated useful lives, using the straight-line method, on the following bases:

Leasehold property improvements	Up to 20 years
Plant and machinery	Three to 20 years
Buildings	Up to 40 years

Assets held under finance leases are depreciated over their expected useful lives on the same basis as owned assets or, where shorter, over the term of the relevant lease.

The gain or loss arising on the disposal of an asset is determined as the difference between the sales proceeds and the carrying amount of the asset and is recognised in income.

Internally generated intangible assets – research and development expenditure

Expenditure on research activities is recognised as an expense in the period in which it is incurred.

In accordance with IAS 38 Intangible Assets where a project has entered the development phase and is sufficiently self-contained that the expected future economic benefits can be traced directly to the assets developed within the project, it is probable that the expected future economic benefits that are attributable to the asset will flow to the entity, and the cost of the asset can be measured reliably, the development costs related to the project will be capitalised as an intangible asset.

Internally generated intangible assets are amortised on a straight-line basis over their useful lives. Where no internally generated intangible asset can be recognised, development expenditure is recognised as an expense in the period in which it is incurred.

Other intangible assets

Costs incurred in maintaining the patent and trademark portfolio are written off to the income statement as incurred.

Payments in respect of software, external product development costs and licence rights acquired are capitalised at cost and amortised on a straight-line basis over their estimated useful lives.

Impairment of tangible and intangible assets excluding goodwill

At the date of each statement of financial position, the Group reviews the carrying amounts of its tangible and intangible assets to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss (if any). Where the asset does not generate cash flows that are independent from other assets, the Group estimates the recoverable amount of the cash-generating unit to which the asset belongs.

Recoverable amount is the higher of fair value less costs to sell and value-in-use. In assessing value-in-use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset for which the estimates of future cash flows have not been adjusted.

If the recoverable amount of an asset (or cash-generating unit) is estimated to be less than its carrying amount, the carrying amount of the asset (cash-generating unit) is reduced to its recoverable amount. An impairment loss is recognised as an expense immediately.

Where an impairment loss is subsequently reversed, the carrying amount of the asset (or cash-generating unit) is increased to the revised estimate of its recoverable amount, but so that the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognised for the asset (or cash-generating unit) in prior years. A reversal of an impairment loss is recognised as income immediately.

Inventories

Inventories are stated at the lower of cost and net realisable value. Cost is calculated using the first in, first out (FIFO) cost formula, by applying the standard cost methodology, with costs including direct materials, direct labour costs and an attributable proportion of manufacturing overheads based on normal levels of activity that have been incurred in bringing the inventories to their present location and condition. Net realisable value represents the estimated selling price less all estimated costs of completion and costs to be incurred in marketing, selling and distribution. Provision is made for obsolete, slow-moving or defective items where applicable.

Financial instruments

Financial assets and financial liabilities are recognised in the Group's statement of financial position when the Group becomes a party to the contractual provisions of the instrument.

Financial assets and financial liabilities are initially measured at fair value. Transaction costs that are directly attributable to the acquisition or issue of financial assets and financial liabilities are added to or deducted from the fair value of the financial assets or financial liabilities, as appropriate, on initial recognition. Transaction costs directly attributable to the acquisition of financial assets or financial liabilities at fair value through profit or loss are recognised immediately in profit or loss.

3. Significant accounting policies continued

Financial assets

All regular way purchases or sales of financial assets are recognised and derecognised on a trade date basis. Regular way purchases or sales are purchases or sales of financial assets that require delivery of assets within the time frame established by regulation or convention in the marketplace.

All recognised financial assets are measured subsequently in their entirety at either amortised cost or fair value, depending on the classification of the financial assets.

Effective interest method

The effective interest method is a method of calculating the amortised cost of a debt instrument and of allocating interest income over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash receipts through the life of the debt instrument, or, where appropriate, a shorter period, to the net carrying amount on initial recognition.

Impairment of financial assets

Financial assets are assessed for indicators of impairment at the date of each statement of financial position. Financial assets are impaired where there is objective evidence that, as a result of one or more events that occurred after the initial recognition of the financial asset, the estimated future cash flows of the investment have been affected.

For financial assets carried at amortised cost, the amount of the impairment is the differences between the asset's carrying amount and the present value of the estimated future cash flows, discounted at the financial asset's original effective interest rate.

Derecognition of financial assets

The Group derecognises a financial asset only when the contractual rights to the cash flows from the asset expire, or when it transfers the financial asset and substantially all the risks and rewards of ownership of the asset to another entity. If the Group neither transfers nor retains substantially all the risks and rewards of ownership and continues to control the transferred asset, the Group recognises its retained interest in the asset and an associated liability for amounts it may have to pay. If the Group retains substantially all the risks and rewards of ownership of a transferred financial asset, the Group continues to recognise the financial asset and also recognises a collateralised borrowing for the proceeds received.

On derecognition of a financial asset, the difference between the asset's carrying amount and the sum of the consideration received and receivable and the cumulative gain or loss that had been recognised in other comprehensive income and accumulated in equity is recognised in profit or loss.

Financial liabilities and equity

Debt and equity instruments are classified as either financial liabilities or as equity in accordance with the substance of the contractual arrangement.

Financial liabilities

All financial liabilities are measured subsequently at amortised cost using the effective interest method or at FVTPL.

However, financial liabilities that arise when a transfer of a financial asset does not qualify for derecognition or when the continuing involvement approach applies, and financial guarantee contracts issued by the Group, are measured in accordance with the specific accounting policies set out below.

Financial liabilities are classified at FVTPL when the financial liability is (i) contingent consideration of an acquirer in a business combination, (ii) held for trading or (iii) it is designated as at FVTPL.

Financial liabilities at FVTPL are measured at fair value, with any gains or losses arising on changes in fair value recognised in profit or loss to the extent that they are not part of a designated hedging relationship. The net gain or loss recognised in profit or loss incorporates any interest paid on the financial liability and is included within 'other gains and losses' in profit or loss.

The effective interest method is a method of calculating the amortised cost of a financial liability and of allocating interest expense over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash payments (including all fees and points paid or received that form an integral part of the effective interest rate, transaction costs and other premiums or discounts) through the expected life of the financial liability, or (where appropriate) a shorter period, to the amortised cost of a financial liability.

Derecognition of financial liabilities

The Group derecognises financial liabilities when, and only when, the Group's obligations are discharged, cancelled or have expired. The difference between the carrying amount of the financial liability derecognised and the consideration paid and payable is recognised in profit and loss.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
for the year ended 31 December 2018

3. Significant accounting policies continued

Derivative financial instruments

The Group's activities expose it primarily to the financial risks of changes in foreign currency exchange rates and interest rates and liquidity risk. The Group uses derivative financial instruments (primarily foreign currency forward contracts) to hedge its risks associated with foreign currency fluctuations relating to certain firm commitments and forecast transactions.

Derivatives are recognised initially at fair value at the date a derivative contract is entered into and are subsequently remeasured to their fair value at each reporting date. The resulting gain or loss is recognised in profit or loss immediately unless the derivative is designated and effective as a hedging instrument, in which event the timing of the recognition in profit or loss depends on the nature of the hedge relationship.

A derivative with a positive fair value is recognised as a financial asset whereas a derivative with a negative fair value is recognised as a financial liability. Derivatives are not offset in the financial statements unless the Group has both legal right and intention to offset. The impact of the Master Netting Agreements on the Group's financial position is disclosed in note 20. A derivative is presented as a non-current asset or a non-current liability if the remaining maturity of the instrument is more than 12 months and it is not expected to be realised or settled within 12 months. Other derivatives are presented as current assets or current liabilities.

Embedded derivatives

An embedded derivative is a component of a hybrid contract that also includes a non-derivative host with the effect that some of the cash flows of the combined instrument vary in a way similar to a stand-alone derivative.

Derivatives embedded in hybrid contracts with a financial asset host within the scope of IFRS 9 are not separated. The entire hybrid contract is classified and subsequently measured as either amortised cost or fair value as appropriate.

Derivatives embedded in hybrid contracts with hosts that are not financial assets within the scope of IFRS 9 (e.g. financial liabilities) are treated as separate derivatives when they meet the definition of a derivative, their risks and characteristics are not closely related to those of the host contracts and the host contracts are not measured at FVTPL.

If the hybrid contract is a quoted financial liability, instead of separating the embedded derivative, the Group generally designates the whole hybrid contract at FVTPL.

An embedded derivative is presented as a non-current asset or non-current liability if the remaining maturity of the hybrid instrument to which the embedded derivative relates is more than 12 months and is not expected to be realised or settled within 12 months.

The Group's interest rate risk arises mainly from its funds invested in short term bank deposits. To mitigate these risks, limits have been set by the Board in relation to maturity period and maximum deposits with any one institution.

In order to mitigate the Group's liquidity risks, the Group can choose to fund significant fixed asset purchases by finance leases repayable over a period of three to five years dependent on the individual asset being financed and interest-bearing loans.

The use of financial derivatives is governed by the Group's policies approved by the Board of Directors, which provides written principles on the use of financial derivatives consistent with the Group's risk management strategy. The Group does not use derivative financial instruments for speculative purposes.

Cash and cash equivalents

Cash and cash equivalents comprise cash on hand and demand deposits and other short term highly liquid investments that are readily convertible to a known amount of cash within a period of up to three months post the date of the statement of financial position and are subject to an insignificant risk of changes in value.

Treasury deposits

Treasury deposits comprise demand deposits that are convertible to a known amount of cash with an original maturity of between three months and 12 months and are subject to an insignificant risk of changes in value.

Interest-bearing loans and borrowings

Interest-bearing loans and bank overdrafts are measured initially at fair value, net of direct issue costs. Finance charges, including premiums payable on settlement or redemption and direct issue costs, are accounted for on an accrual basis in the income statement using the effective interest rate method and are added to the carrying amount of the instrument to the extent that they are not settled in the period in which they arise.

Equity instruments

Equity instruments issued by the Company are recorded as the proceeds received, net of direct issue costs.

Provisions

Provisions are recognised when the Group has a present obligation as a result of a past event and it is probable that the Group will be required to settle that obligation. Provisions are measured at the Directors' best estimate of the expenditure required to settle the obligation at the date of the statement of financial position and are discounted where the effect of the time value of money is material.

A restructuring provision is recognised when the Group has developed a detailed formal plan for the restructuring and has raised a valid expectation in those affected that it will carry out the restructuring by starting to implement the plan or announcing its main features to those affected by it, and the plan has reached a stage where the decision is unlikely to be reversed. The measurement of a restructuring provision includes only the direct expenditures arising from the restructuring, which are those amounts that are both necessarily entailed by the restructuring and not associated with the ongoing activities of the entity.

Provisions for the expected cost of warranty obligations under local sale of goods legislation are recognised in the month of sale of the relevant products, at the Directors' best estimate of the expenditure required to settle the Group's obligation.

3. Significant accounting policies continued

Share-based payments

The Group has applied the requirements of IFRS 2 Share-based Payment. In accordance with the transitional provisions, IFRS 2 has been applied to all grants of equity instruments after 7 November 2002 that were unvested at 1 January 2005.

The Group issues equity-settled share-based payments to certain employees. These payments are measured at fair value (excluding the effect of non-market based vesting conditions) at the date of grant. The fair value determined at the grant date of the equity-settled share-based payments is expensed on a straight-line basis over the vesting period, based on the Group's estimate of the shares that will eventually vest and adjusted for the effect of non-market based vesting conditions.

The fair value of options issued under the Group's Long Term Incentive Plan is measured using a stochastic (Monte Carlo binomial) model for grants made with market based vesting conditions since 2007. The fair value of all other equity-settled share-based payments is measured using the Black-Scholes pricing model. The expected life used in these models has been adjusted, based on management's best estimate, for the effects of non-transferability, exercise restrictions and behavioural considerations.

SAYE share options granted to employees are treated as cancelled when employees cease to contribute to the scheme. This results in accelerated recognition of the expenses that would have arisen over the remainder of the original vesting period.

Own shares

Own shares are deducted from equity. No gain or loss is recognised in the income statement on the purchase, sale, issue or cancellation of the Group's own shares.

Adoption of new and revised standards

New and amended IFRS standards that are effective for the current period commencing 1 January 2018 are listed below:

IFRS 9 'Financial Instruments'

IFRS 9 'Financial instruments' is effective from 1 January 2018 and replaces the existing standard IAS 39 'Financial Instruments Recognition and Measurement'. IFRS 9 is applicable to financial assets and financial liabilities, and covers classification, measurement and derecognition. The Group considers there to be no material impact on the financial statements as a result from adoption of the new standard IFRS 9.

IFRS 15 'Revenue from Contracts with Customers'

IFRS 15 establishes a comprehensive framework for determining whether, how much and when revenue is recognised. It replaces existing revenue recognition guidance, IAS 18 Revenue. IFRS 15 uses a five step model to account for how revenue is recognised as goods or services are transferred to a customer. The standard is effective for periods commencing on or after 1 January 2018 and the Group has adopted this standard in the 2018 financial statements. For the majority of the Group's revenue streams the adoption of IFRS 15 has not had an impact. The key revenue stream impacted has been listed below.

Sales of custom-built printing machines

The Group's US subsidiary EPS sells custom-built printing machines to industrial customers. As required by the standard, where certain conditions are satisfied (IFRS 15, paragraph 35), revenue is recognised over a period of time. Where the required conditions are not satisfied, revenue is recognised at a point in time (when control is transferred). Each contract is assessed on a case by cases basis to determine if the conditions are satisfied in order to recognise revenue over a period of time.

Transition

When adopting IFRS 15 the Group has applied the modified retrospective approach, with any cumulative effect of initially applying this standard recognised at the date of initial application (i.e. 1 January 2018). As a result, the Group is not required to restate comparative periods.

New standards and interpretations

A number of new standards are effective for annual periods beginning on or after 1 January 2019. The following standards are expected to have an impact on the Group's financial statements in the period of initial application.

IFRS 16 'Leases'

IFRS 16 replaces existing leases guidance, including IAS 17 'Leases', IFRIC 4 'Determining whether an Arrangement contains a Lease', SIC-15 'Operating Leases' – Incentives and SIC-27 'Evaluating the Substance of Transactions Involving the Legal Form of a Lease.'

The standard is effective for annual periods beginning on or after 1 January 2019.

IFRS 16 introduces a single, on-statement of financial position lease accounting model for lessees. A lessee recognises a right-of-use asset representing its right to use the underlying asset and a lease liability representing its obligation to make lease payments. There are recognition exemptions for short term leases and leases of low-value items.

In addition, the nature of expenses related to those leases will now change as IFRS 16 replaces the straight-line operating lease expense with a depreciation charge for right-of-use assets and interest expense on lease liabilities.

The Group has completed a detailed assessment to quantify the impact on its reported assets and liabilities of IFRS 16. The Group will transition to IFRS 16 using the modified retrospective application approach with no restatement of prior year comparatives. On 1 January 2019 the Group expects to recognise new right-of-use assets of approximately £2.8 million and lease liabilities of approximately £2.9 million for its operating leases in respect of premises, vehicles and equipment. The nature of expenses relating to these leases will also change as the straight-line operating lease expense will be replaced with a depreciation charge for right-of-use asset and interest expense on lease liabilities. In the first year of adoption these are expected to be approximately £0.6 million and £0.3 million respectively. The Group plans to adopt IFRS 16 in its financial statements for the year ended 31 December 2019.

The Group does not currently have any finance leases, but were it to take out any in the future, they would not be expected to be significantly impacted by IFRS 16.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
for the year ended 31 December 2018

3. Significant accounting policies continued

Transition

As a lessee, the Group can elect to apply the standard using a retrospective approach, or a modified retrospective approach with optional practical expedients. The lessee applies this election consistently to all of its leases.

The Group plans to apply IFRS 16 initially on 1 January 2019, using the modified retrospective approach. Therefore, the cumulative effect of adopting IFRS 16 will be recognised as an adjustment to the opening balance of retained earnings at 1 January 2019, with no restatement of comparative information.

When applying the modified retrospective approach to leases previously classified as operating leases under IAS 17, the lessee can elect, on a lease-by-lease basis, whether to apply a number of practical expedients on transition. The Group is assessing the potential impact of using these practical expedients.

Other standards

The following new standards, amended standards and interpretations are not expected to have a significant impact on the Group's financial statements:

IFRS 2 (amendments)	Classification and Measurement of Share-based Payment Transactions
IFRIC Interpretation 22	Foreign Currency Transactions and Advance Consideration
IFRIC Interpretation 23	Uncertainty over Income Tax Treatments
IFRS 9 (amendments)	Prepayment Features with Negative Compensation
IAS 28 (amendments)	Long-term Interests in Associates and Joint Ventures
IAS 19 (amendments)	Plan Amendment, Curtailment or Settlement
IFRS 10 and IAS 28 (amendments)	Sales or Contribution of Assets Between an Investor and its Associate or Joint Venture
IFRIC 23	Uncertainty over Income Tax Treatments
Annual Improvements to IFRSs (amendments)	

Changes to reportable segments

Following changes to the structure of the Group's internal organisation and subsequent changes in the way in which financial and management information is presented to both the Board and the Executive Team, the composition of the Group's reportable segments changed in the year ended 31 December 2018.

The changes to the Group's organisational structure has followed the acquisition of EPS and the investment in 3D Printing solutions. The activities of the Group are managed in three distinct business units with a more focused approach. As a result of these changes, activities are now reported under three new operating segments, 'Printhead', 'Product Print Systems' and '3D Printing'.

3. Significant accounting policies continued

Changes to reportable segments continued

The changes to reported segments can be summarised as follows:

The segment disclosure note for the year ended 31 December 2017 has been amended as follows:

		12 months ended 31 December 2017	
	As reported £'000	Adjustment £'000	Restated £'000
Revenue			
Product sales, commissions and fees	83,758	**(83,758)**	–
Royalties	16,384	**(16,384)**	–
Printhead	–	**86,086**	86,086
Product Print Systems	–	**13,973**	13,973
3D Printing	–	**83**	83
Total revenue	100,142	**–**	100,142
Result			
Product sales, commissions and fees	(687)	**687**	–
Royalties	15,842	**(15,842)**	–
Unallocated	192	**(192)**	–
Printhead	–	**15,539**	15,539
Product Print Systems	–	**527**	527
3D Printing	–	**(719)**	(719)
Total segment result	15,347	**–**	15,347
Segment assets			
Product sales, commissions and fees	123,800	**(123,800)**	–
Royalties	1,253	**(1,253)**	–
Unallocated	44,697	**(44,697)**	–
Printhead	–	**154,756**	154,756
Product Print Systems	–	**13,519**	13,519
3D Printing	–	**1,475**	1,475
Total assets	169,750	**–**	169,750
Other segment information: depreciation and amortisation			
Product sales, commissions and fees	8,944	**(8,944)**	–
Printhead	–	**8,488**	8,488
Product Print Systems	–	**317**	317
3D Printing	–	**139**	139
Total depreciation and amortisation	8,944	**–**	8,944
Capital expenditure			
Product sales, commissions and fees	11,947	**(11,947)**	–
Printhead	–	**10,117**	10,117
Product Print Systems	–	**631**	631
3D Printing	–	**1,199**	1,199
Total capital expenditure	11,947	**–**	11,947

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
for the year ended 31 December 2018

4. Reconciliation of adjusted financial measures

	2018 £'000	2017 £'000
(Loss)/profit before tax	**(14,927)**	12,290
Share-based payment charges	**235**	3,057
Exchange differences on intra-group transactions	**(629)**	523
Restructuring and investment expenses	**5,337**	2,553
Research and development expenditure credit	**(1,737)**	(411)
Adjusted (loss)/profit before tax	**(11,721)**	18,012
Capitalised research and development expense and related amortisation	**(339)**	(5,795)
Adjusted (loss)/profit before tax excluding the impact of IAS 38	**(12,060)**	12,217

Adjusted financial measures are alternative performance measures, which adjust for recurring and non-recurring items that management consider to have a distorting effect on the underlying results of the Group.

Share-based payment charges include the IFRS 2 charge for the period of £506,000 (2017: £2,747,000) and the credit relating to National Insurance on the outstanding potential share option gains of £271,000 (2017: charge of £310,000). These costs were included in the general and administrative expenses in the Consolidated income statement.

Exchange differences relating to the United States, Danish and Swedish operations represent exchange gains or losses recorded in the consolidated income statement as a result of operating in the United States, Denmark and Sweden. These costs were included in general and administrative expenses in the Consolidated income statement.

Restructuring costs of £5,337,000 in 2018 (2017: £2,553,000) relates mainly to the impairment of fixed assets of £3,126,000 used by the Printhead Business Unit. The fair value less costs of disposal is less than the value in use and hence the recoverable amount of the relevant assets has been determined on the basis of their value in use. The remaining costs relate to expenses incurred and provisions made in relation to a reorganisation, the closure of the manufacturing facility in Sweden in 2016, and investment related expenditure.

The research and development expenditure credit relates to the corporation tax relief receivable relating to qualifying research and development expenditure. This item is shown on the face of the Consolidated income statement.

	2018 Pence per share	2017 Pence per share
Diluted earnings per share	**(16.0p)**	14.0p
Share-based payment charges	**0.3p**	3.9p
Exchange differences on intra-group transactions	**(0.8p)**	0.7p
Restructuring and investment expenses	**6.9p**	3.3p
Tax effect of adjusting items	**(0.1p)**	(1.2p)
Adjusted diluted earnings per share	**(9.7p)**	20.7p

5. Revenue

The Group derives its revenue from contracts with customers for the transfer of goods and services over time and at a point in time in the following major segments. The revenue for 2017 has been restated following changes to the Group's reportable segments. This is consistent with the revenue information that is disclosed for each reportable segment under IFRS 8 Operating Segments (note 6).

	2018 £'000	2017 £'000 Restated (note 3)
Printhead	**49,775**	86,086
Product Print Systems	**13,658**	13,973
3D Printing	**101**	83
	63,534	100,142

Product Print Systems has contracts with customers where the performance obligations are partially unsatisfied at 31 December 2018. The transaction price allocated to the total value of these contracts is £1,461,000. Included within this value is £395,000 was the transaction price allocated to unsatisfied performance obligations as at 31 December 2018. Management expect to recognise the full £395,000 relating to unsatisfied performance obligations in the year ended 31 December 2019.

6. Business and geographical segments

Products and services from which reportable segments derive their revenues.

For management reporting purposes, the Group's operations are analysed according to the three operating segments of 'Printhead', 'Product Print Systems', and '3D Printing'. These three operating segments are the basis on which the Group reports its primary segment information and on which decisions are made by the Group's Chief Executive Officer and Board of Directors, and resources allocated. The Group's chief operating decision maker is the Chief Executive Officer.

Segment information is presented below:

Year ended 31 December 2018	Printhead £'000	Product Print Systems £'000	3D Printing £'000	Unallocated £'000	Consolidated £'000
Revenue					
Total segment revenue	**49,775**	**13,658**	**101**	**–**	**63,534**
Result					
Adjusted (loss)/profit before tax	(11,677)	406	(450)	–	(11,721)
Share-based payment charges	–	–	–	(235)	(235)
Exchange differences relating to intra-group transactions	631	–	(2)	–	629
Restructuring and investment expenses	(4,381)	(982)	26	–	(5,337)
Research and development expenditure credit	1,733	–	4	–	1,737
Loss before tax	**(13,694)**	**(576)**	**(422)**	**(235)**	**(14,927)**

Share-based payment charges include the IFRS 2 charge for the period and the charge relating to National Insurance on the outstanding potential share option gains.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
for the year ended 31 December 2018

6. Business and geographical segments continued

Year ended 31 December 2017	Printhead £'000	Product Print Systems £'000	3D Printing £'000	Unallocated £'000	Consolidated £'000
Revenue					
Total segment revenue	86,086	13,973	83	–	100,142
Result					
Adjusted profit/(loss) before tax	17,571	1,163	(722)	–	18,012
Share-based payment charges	–	–	–	(3,057)	(3,057)
Exchange differences relating to intra-group transactions	(523)	–	–	–	(523)
Restructuring and investment expenses	(1,917)	(636)	–	–	(2,553)
Research and development expenditure credit	408	–	3	–	411
Profit/(loss) before tax	15,539	527	(719)	(3,057)	12,290

Segment assets

	2018 £'000	2017 £'000
Printhead	**124,242**	154,264
Product Print Systems	**15,611**	14,011
3D Printing	**13,137**	1,475
Total assets	**152,990**	169,750

Assets are allocated to the segment which has responsibility for their control.

No information is provided for segment liabilities as this measure is not provided to the chief operating decision maker.

6. Business and geographical segments continued

Other segment information

Year ended 31 December 2018	Notes	Printhead £'000	Product Print Systems £'000	3D Printing £'000	Unallocated £'000	Consolidated £'000
Depreciation and amortisation	14, 15	**6,430**	**366**	**68**	**–**	**6,864**
Share-based payment charges		**–**	**–**	**–**	**235**	**235**
Capital expenditure	14, 15	**2,861**	**217**	**2,169**	**–**	**5,247**

Year ended 31 December 2017	Notes	Printhead £'000	Product Print Systems £'000	3D Printing £'000	Unallocated £'000	Consolidated £'000
Depreciation and amortisation	14, 15	8,488	317	139	–	8,944
Share-based payment charges		–	–	–	3,057	3,057
Capital expenditure	14, 15	10,117	631	1,199	–	11,947

Revenues from major products and services

	2018 £'000	2017 £'000
Printhead	**49,775**	86,086
Product Print Systems	**13,658**	13,973
3D Printing	**101**	83
Consolidated revenue (excluding investment income)	**63,534**	100,142

Geographical information

The Group operates in three principal geographical areas: EMEA, the Americas and Asia. The Group's revenue from external customers and information about its segments (non-current assets excluding deferred tax assets and other financial assets) by geographical location is detailed below:

	Revenue from external customers	
	2018 £'000	2017 £'000
EMEA	**22,761**	29,784
Asia		
– China	**6,737**	32,139
– Japan	**12,117**	18,214
– Other	**940**	594
The Americas (including USA)	**20,979**	19,411
	63,534	100,142

Revenues are attributed to geographical areas on the basis of the customer's operating location.

	Non-current assets	
	2018 £'000	2017 £'000
EMEA	**58,128**	63,298
Asia	**8**	15
The Americas (including USA)	**8,226**	8,906
	66,362	72,219

Non-current assets, being property, plant and equipment, goodwill, other intangible assets, investments and the deferred tax asset, are attributed to the location where they are situated.

Information about major customers

Included in Printhead revenues arising from royalties, is one customer whose revenue exceeds 10% of total revenues, with revenue of £9.9 million (16% of total revenues) (2017: one customer whose revenue exceeds 10% of total revenues, with revenue of £14.7 million (15% of total revenues)). No other single customer contributed 10% or more to the Group's revenue in either 2018 or 2017.

Revenue from the top five customers represents 31% of revenues (2017: 42%).

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
for the year ended 31 December 2018

7. (Loss)/profit for the year
(Loss)/profit for the year has been arrived at after charging/(crediting):

	2018 £'000	2017 £'000
Research and development expenses (net of capitalised development costs)*	**14,682**	12,318
Grants towards research and development including the research and development expenditure credit	**(1,823)**	(489)
Depreciation of property, plant and equipment	**4,725**	7,795
Amortisation of capitalised development costs (included in research and development expenses)	**2,069**	1,149
Amortisation of software (included in general and administrative expenses)	**63**	25
Amortisation of licence (included in general and administrative expenses)	**7**	–
Loss on disposal of property, plant and equipment	**–**	351
Cost of inventories recognised as expense	**39,085**	53,097
Impairment of other financial assets	**4,681**	17
Total fees payable to the Company's auditor and its associates	**288**	173

* Total spend on research and development in 2018, before capitalised and amortised development costs included in note 14, was £15,021,000 (2017: £18,113,000).

Grant income includes £1,737,000 in respect of the research and development expenditure credit and £86,000 of grant income in support of the Xaar 3D Centre.

Auditor's remuneration

	2018 £'000	2017 £'000
Fees payable to the Company's auditor for the audit of the Company's annual accounts	**22**	22
Fees payable to the Company's auditor and its associates for other services to the Group		
– The audit of the Company's subsidiaries	**240**	119
Total audit fees	**262**	141
– Interim review	**26**	26
– Taxation compliance services	**–**	6
Total non-audit fees	**26**	32
Total fees payable to the Company's auditor and its associates	**288**	173

The Audit Committee has considered the independence of the auditor in relation to non-audit services throughout the year. A description of the work of the Audit Committee is set out in the Corporate Governance statement on page 56.

8. Staff costs
The average monthly number of persons employed by the Group including Executive Directors was as follows:

	2018 Number	2017 Number
Research and development	**74**	113
Sales and marketing	**86**	54
Manufacturing and engineering	**291**	364
Administration	**65**	72
	516	603

Their aggregate remuneration comprised:

	Notes	2018 £'000	2017 £'000
Wages and salaries		**21,894**	26,918
Social security costs		**2,341**	2,741
Pension costs	33	**1,053**	1,216
Share-based payments		**235**	3,057
		25,523	33,932

Share-based payment charges include the IFRS 2 charge for the period and the charge relating to National Insurance on the outstanding potential share option gains.

9. Investment income

	2018 £'000	2017 £'000
Interest receivable on cash and bank balances, and treasury deposits	**170**	192

10. Tax

	Notes	2018 £'000	2017 £'000
Current tax – UK		**241**	1,516
Current tax – overseas		**10**	(229)
		251	1,287
Amounts under/(over) provided in previous years		**238**	(1,102)
Total current income tax		**489**	185
Deferred tax – origination and reversal		**(3,355)**	279
Adjustment in respect of prior years		**277**	894
Total deferred tax charge	21	**(3,078)**	1,173
Total tax expense for the year		**(2,589)**	1,358

The blended standard rate of tax for the year, based on the UK standard rate of corporation tax, is 19% (2017: 19.25%). Taxation for other jurisdictions is calculated at the rates prevailing in the respective jurisdictions.

The Finance (No 2) Act 2015 provided for a reduction in the main rate of corporation tax from 20% to 19%, which was effective from 1 April 2017, and a reduction to 18% effective from 1 April 2020. Finance Act 2016, provides for a further reduction in the main rate of corporation tax to 17% effective from 1 April 2020. These rate reductions have been reflected in the calculation of deferred tax at the balance sheet date.

The note to the cash flow statement (note 30) shows payments of tax of £471,000 during the year (2017: repayments of £457,000).

The closing deferred tax liability at 31 December 2018 has been calculated at 17% reflecting the tax rate at which the deferred tax liability is expected to be reversed in future periods. Details on deferred tax liabilities are disclosed in note 21.

In addition to the amount charged to the income statement and other comprehensive income, the following amounts relating to tax have been recognised directly in equity:

	Notes	2018 £'000	2017 £'000
Current tax			
Excess tax deductions in relation to share-based payments on exercised options	21	**(1)**	(26)
		(1)	(26)
Deferred tax			
Arising on transactions with equity participants:			
Change in estimated excess tax deductions in relation to share-based payments	21	**42**	46
		42	46
Total income tax recognised directly in equity		**41**	20

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10. Tax continued
The (credit)/charge for the year can be reconciled to the profit per the income statement as follows:

	2018 £'000	2017 £'000
(Loss)/profit on ordinary activities before tax	**(14,927)**	12,290
Tax at a blended standard UK rate of 19.00% (2017: 19.25%)	**(2,836)**	2,366
Effect of:		
Expenses not deductible for tax purposes	**392**	518
(Non-taxable)/non-deductible foreign exchange differences	**(25)**	126
Effect of different tax rates of subsidiaries operating overseas	**(110)**	19
Enhanced tax deduction for patent box	**(904)**	(1,411)
Effect of change in UK corporation tax rate on deferred tax	**379**	(52)
Prior year adjustments	**515**	(208)
Total tax (credit)/expense for the year	**(2,589)**	1,358

The expenses not deductible for tax purposes mainly relate to depreciation on non-qualifying assets and share-based payments.

The effective tax rate for the year is 17% (2017: 11%). For 2018 if the prior year adjustments were excluded the effective tax rate would have been 20% (2017: 13%).

11. Dividends

	2018 £'000	2017 £'000
Amounts recognised as distributions to equity holders in the year:		
Final dividend for the year ended 31 December 2017 of 6.8p (2016: 6.7p) per share	**5,238**	5,126
Interim dividend for the year ended 31 December 2018 of 1.0p (2017: 3.4p) per share	**771**	2,602
Total distributions to equity holders in the year	**6,009**	7,728
Proposed final dividend for the year ended 31 December 2018 of nil (2017: 6.8p) per share	**–**	5,326

12. Earnings per ordinary share – basic and diluted
The calculation of basic and diluted earnings per share is based on the following data:

	2018 £'000	2017 £'000
Earnings		
Earnings for the purposes of basic earnings per share being net (loss)/profit attributable to equity holders of the parent	**(12,338)**	10,932
Number of shares		
Weighted average number of ordinary shares for the purposes of basic earnings per share	**76,957,142**	76,469,128
Effect of dilutive potential ordinary shares:		
Share options	**–**	1,441,475
Weighted average number of ordinary shares for the purposes of diluted earnings per share	**76,957,142**	77,910,603

	2018 Pence per share	2017 Pence per share
Basic	**(16.0p)**	14.3p
Diluted	**(16.0p)**	14.0p

Potential ordinary shares are treated as dilutive if their conversion to ordinary shares would decrease earnings per share or increase loss per share. Therefore in 2018, the diluted earnings per share is not impacted by the effect of dilutive potential ordinary shares.

The weighted average number of ordinary shares for the purposes of basic earnings per share is calculated after the exclusion of ordinary shares in Xaar plc held by Xaar Trustee Ltd, the Xaar plc ESOP Trust and the matching shares held in trust for the Share Incentive Plan.

For 2018, there were share options granted over 541,008 shares that would not have been included in the diluted earnings per share calculation because they were anti-dilutive at the year end (2017: 382,843 shares had not been included).

12. Earnings per ordinary share – basic and diluted continued

The performance conditions for LTIP awards over 1,581,632 shares (2017: 657,355 shares) have not been met in the current financial year or are not expected to be met in future financial periods, and therefore the dilutive effect of those shares have not been included in the diluted earnings per share calculation.

Adjusted earnings per share

This adjusted earnings per share information is considered to provide a fairer representation of the Group's trading performance year on year, as it removes items which, in the Board's opinion, do not reflect the underlying performance of the Group.

The calculation of adjusted EPS excluding share-based payment charges, exchange differences relating to intra-group transactions, restructuring and acquisition expenses, is based on earnings of:

	2018 £'000	2017 £'000
Earnings for the purposes of basic earnings per share being net (loss)/profit attributable to equity holders of the parent	**(12,338)**	10,932
Share-based payment charges	**235**	3,057
Exchange differences relating to intra-group transactions	**(629)**	523
Restructuring and acquisition expenses	**5,337**	2,553
Tax effect of adjusting items	**(68)**	(929)
Adjusted (loss)/profit after tax	**(7,463)**	16,136
Adjusted (loss)/profit after tax excluding the net of tax impact of IAS 38*	**(7,890)**	11,959

The denominators used are the same as those detailed above for both basic and diluted earnings per share.

Adjusted earnings per share is earnings per share excluding the items adjusted for as detailed above:

	2018 Pence per share	2017 Pence per share
Adjusted basic	**(9.7p)**	21.1p
Adjusted diluted	**(9.7p)**	20.7p
Adjusted basic excluding the impact of IAS 38*	**(10.3p)**	15.6p

* Adjusted profit after tax excluding the net of tax impact of IAS 38 and adjusted basic EPS excluding the impact of IAS 38 Capitalisation of Development Costs are the measures deemed most appropriate by the Remuneration Committee to determine the achievement of the performance conditions for the LTIP awards that are subject to the EPS performance conditions.

Adjusted EPS is considered to provide a fairer representation of the Group's trading performance year on year.

13. Goodwill

The carrying amount of goodwill at 31 December 2018 was £5,522,000 (2017: £5,212,000).

Goodwill acquired in a business combination is allocated, at acquisition, to the cash-generating units (CGUs) that are expected to benefit from that business combination. Goodwill occurred from the acquisition of EPS in July 2016.

	2018 £'000	2017 £'000
Product Print Systems (a single CGU)		
Balance at the beginning of the year	**5,212**	5,776
Foreign currency translation	**310**	(564)
Balance at the end of the year	**5,522**	5,212

Goodwill relates to the acquisition of a EPS in July 2016 (a Company incorporated in USA). As part of the changes to the reportable segments in the current year, the goodwill stated above is now wholly attributed to Product Print Systems (a single CGU). In the year ended 31 December 2017 this was attributed to Printheads and related products (a single CGU). Further information on changes on reportable segments can be found on page 99.

The Group tests goodwill annually for impairment or more frequently if there are indications that goodwill might be impaired. Having performed impairment testing, no impairment has been identified and therefore no impairment loss has been recognised in 2018 (2017: £nil).

The recoverable amount of the CGU is determined from a value-in-use calculation. The key assumptions to which the value-in-use calculation is most sensitive are those regarding the discount rates and expected changes to selling prices and direct costs during the period.

The Group prepares cash flow forecasts derived from the most recent financial forecasts reviewed by management for the next three years and these have been used in the value-in-use calculation. The discount rate applied to the cash flow projections is 8.4% (2017: 8.1%) and reflects management's estimate of return on capital employed.

Sensitivity analysis has been completed on each key assumption in isolation and this indicates that reasonable changes in key assumptions on which we have based our determination of the recoverable amount would not cause the carrying amount of goodwill to exceed its recoverable amount.

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14. Other intangible assets

	Capitalised development costs £'000	Licences acquired £'000	Software £'000	Total £'000
Cost				
At 1 January 2017	33,116	617	3,173	36,906
Additions	6,451	–	19	6,470
Transfers	(17)	(84)	101	–
Exchange movements	–	–	(6)	(6)
Disposals	–	–	(64)	(64)
At 1 January 2018	**39,550**	**533**	**3,223**	**43,306**
Additions	1,915	177	160	2,252
Exchange movements	–	5	–	5
At 31 December 2018	**41,465**	**715**	**3,383**	**45,563**
Amortisation				
At 1 January 2017	5,935	533	3,075	9,543
Charge for the year	1,124	–	25	1,149
Disposals	–	–	(64)	(64)
At 1 January 2018	**7,059**	**533**	**3,036**	**10,628**
Charge for the year	2,069	7	63	2,139
At 31 December 2018	**9,128**	**540**	**3,099**	**12,767**
Carrying amount				
At 31 December 2017	32,491	–	187	32,678
At 31 December 2018	**32,337**	**175**	**284**	**32,796**

Internally generated product development costs relate to the Platform 2, Platform 3 and Platform 4 ranges of printheads and technology. Platform 2 and Platform 3 are fully amortised. Amortisation of Platform 4 commenced in August 2017 and is being amortised over a period of 20 years.

Licences acquired are amortised over their estimated useful lives which is, on average, ten years.

The amortisation period for software is three to five years and for other product development costs incurred on the Group's product development is 10 years.

15. Property, plant and equipment

	Land and buildings £'000	Leasehold property £'000	Plant and machinery £'000	Furniture, fittings and equipment £'000	Assets in the course of construction £'000	Total £'000
Cost						
At 1 January 2017	1,230	14,899	75,336	4,492	2,657	98,614
Additions	–	185	4,673	134	485	5,477
Transfers	–	(78)	(744)	(12)	834	–
Exchange movements	(105)	(69)	(123)	(47)	(2)	(346)
Disposals	–	–	(930)	(378)	–	(1,308)
At 1 January 2018	**1,125**	**14,937**	**78,212**	**4,189**	**3,974**	**102,437**
Additions	–	1,145	1,503	96	251	2,995
Transfers	–	788	1,300	15	(2,103)	–
Exchange movements	67	(9)	(187)	16	2	(111)
Disposals	–	(3,440)	(10,094)	(551)	(2)	(14,087)
At 31 December 2018	**1,192**	**13,421**	**70,734**	**3,765**	**2,122**	**91,234**
Depreciation						
At 1 January 2017	57	9,331	49,320	3,554	–	62,262
Charge for the year	–	1,482	6,124	189	–	7,795
Exchange movements	–	(15)	(72)	(47)	–	(134)
Disposals	–	–	(579)	(378)	–	(957)
At 1 January 2018	**57**	**10,798**	**54,793**	**3,318**	**–**	**68,966**
Charge for the year	7	654	3,969	95	–	4,725
Exchange movements	–	(55)	(194)	(10)	–	(259)
Disposals	–	(3,235)	(9,747)	(518)	–	(13,500)
Impairment	–	60	3,195	3	–	3,258
At 31 December 2018	**64**	**8,222**	**52,016**	**2,888**	**–**	**63,190**
Carrying amount						
At 31 December 2017	1,068	4,139	23,419	871	3,974	33,471
At 31 December 2018	**1,128**	**5,199**	**18,718**	**877**	**2,122**	**28,044**

As at 31 December 2018 the Group had entered into contractual commitments for the acquisition of property, plant and equipment amounting to £90,000 (2017: £1,030,000).

16. Subsidiaries

A list of the investments in subsidiaries, including the name, country of incorporation and proportion of ownership interest, is given in note 9 to the Company's separate financial statements.

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17. Investments

	2018 £'000	2017 £'000
Held-to-maturity investments		
At beginning of the year	–	1,000
Disposals	–	(1,000)
At the end of the year	–	–

Held-to-maturity investments were bonds returning interest at 3% per annum, which were due to mature on 22 November 2018. The option to redeem the bonds was exercised on 21 November 2017.

18. Inventories

	2018 £'000	2017 £'000
Raw materials and consumables	**11,124**	8,533
Work in progress	**2,315**	3,027
Finished goods	**18,703**	7,559
	32,142	19,119

The cost of inventories recognised as an expense includes £3,299,000 (2017: £1,825,000) in respect of inventory write-downs, and has been offset by £1,745,000 (2017: £660,000) in respect of the reversal of such write-downs.

19. Other financial assets

The fair value of all financial assets and financial liabilities approximates their carrying value.

Receivables

	2018 £'000	2017 £'000
Non-current portion of Trade Receivables	–	858

The non-current receivable as at 31 December 2017 related to a last time buy offer and had a settlement term of 23 months. The receivable balance was settled in February 2019. As at 31 December 2018 there were no non-current receivables.

Trade and other receivables

	2018 £'000	2017 £'000
Amount receivable for the sale of goods	**23,825**	25,722
Allowance for doubtful debts	**(5,178)**	(510)
	18,647	25,212
Other debtors	**894**	2,373
Prepayments	**1,857**	2,718
	21,398	30,303

Current tax asset	**5,142**	3,412

No amounts are expected to be settled in more than 12 months.

19. Other financial assets continued
Trade receivables
The average credit period taken on sales of goods is 107 days (2017: 92 days). No interest is charged on the receivables for the period agreed in the Requirements Contract or, if not specified or applicable, the first 30 days from the date of the invoice. Thereafter, the Group reserves the right to charge interest at a daily rate of the greater of either 3% per annum above the base rate of the Bank of England from time to time, or the maximum rate of interest allowable under the Late Payment of Commercial Debts (Interest) Act 1998, on all sums outstanding until payment in full is received. Trade receivables over 120 days are provided for based on estimated irrecoverable amounts from the sale of goods, determined by reference to past default experience.

The maximum exposure to credit risk is the carrying amount of the financial assets as disclosed on page 110. Before accepting any new customer, the Group uses an external credit scoring system to assess the potential customer's credit quality and defines credit limits by customer. Credit limits are reviewed at least once per year. Of the trade receivables balance at the end of the year, four customers each represented greater than 5% of the total receivables balance, totalling £13.6 million (2017: £16.9 million). The total due from these customers represents 21% (2017: 17%) of the Group's revenue.

Included in the Group's trade receivables balance are debtors with a carrying amount of £7.6 million (2017: £3.8 million) which are past due at the reporting date for which the Group has not provided as there has not been a significant change in credit quality and the amounts are still considered recoverable.

Ageing of past due but not impaired receivables:

	2018 £'000	2017 £'000
1–30 days overdue	**1,575**	2,886
30–60 days overdue	**451**	358
60–90 days overdue	**252**	257
90–120 days overdue	**353**	273
Over 120 days overdue	**4,995**	67
Total	**7,626**	3,841
Non-current receivables		
Over 12 months	**–**	–
Total receivables	**7,626**	3,841

Movement in the allowance for doubtful debts:

	2018 £'000	2017 £'000
Balance at the beginning of the year	**510**	480
Impairment losses increased	**4,668**	30
Balance at the end of the year	**5,178**	510

The Group always measures the loss allowance for trade receivables at an amount equal to lifetime ECL. The expected credit losses on trade receivables are estimated using a provision matrix by reference to past default experience of the debtor and an analysis of the debtor's current financial position, adjusted for factors that are specific to the debtors, general economic conditions of the industry in which the debtors operate and an assessment of both the current as well as the forecast direction of conditions at the reporting date. The Group has recognised a loss allowance of 1.5% against all receivables over 120 days past due because historical experience has indicated that these receivables are generally not recoverable.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
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19. Other financial assets continued
Trade receivables continued
Ageing of impaired trade receivables:

	2018 £'000	2017 £'000
Current	–	190
1–30 days overdue	–	–
30–60 days overdue	–	–
60–90 days overdue	–	–
90–120 days overdue	–	–
Over 120 days overdue	**5,178**	320
Total	**5,178**	510

The Directors consider that the carrying amount of trade and other receivables approximates their fair value.

Treasury deposits
Treasury deposits comprise bank deposits with an original maturity of between three months and 12 months. The carrying amount of these assets approximates their fair value.

	2018 £'000	2017 £'000
Treasury deposits	**3,277**	753

Cash and cash equivalents
Cash and cash equivalents comprise cash held by the Group and short term bank deposits with an original maturity of three months or less. The carrying amount of these assets approximates their fair value.

The analysis of cash and short term bank deposits is as follows:

	2018 £'000	2017 £'000
Cash	**24,669**	43,944

The credit risk on liquid funds and derivative financial instruments is limited because the counterparties are banks with high credit ratings assigned by international credit-rating agencies.

20. Financial instruments

Fair value measurements

The following table combines information about:

- Classes of financial instruments based on their nature and characteristics;
- The carrying amounts of financial instruments;
- Fair values of financial instruments (except financial instruments when carrying amount approximates their fair value); and
- Fair value hierarchy levels of financial assets and financial liabilities for which fair value was disclosed.

Fair value hierarchy Levels 1 to 3 are based on the degree to which the fair value is observable:

- Level 1 fair value measurements are those derived from quoted prices (unadjusted) in active markets for identical assets or liabilities
- Level 2 fair value measurements are those derived from inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices)' and
- Level 3 fair value measurements are those derived from valuation techniques that include inputs for the asset or liability that are not based on observable market data (unobservable inputs).

	Financial assets			Financial liabilities		
	FVTPL – designated £'000	FVTPL – mandatorily measured £'000	Amortised cost £'000	FVTPL – mandatorily measured £'000	Amortised cost £'000	Total £'000
Trade and other receivables	–	–	19,541	–	–	19,541
Treasury deposits	–	–	3,277	–	–	3,277
Cash and bank balances	–	–	24,669	–	–	24,669
Trade and other payables	–	–	–	–	(18,958)	(18,958)
Other financial liabilities due within one year	–	–	–	–	(33)	(33)
Other financial liabilities due after more than one year	–	–	–	–	(103)	(103)
Derivative financial instrument	–	–	–	(643)	–	(643)

Fair value of the Group's financial assets and financial liabilities that are measured at fair value on a recurring basis

Some of the Group's financial assets and financial liabilities are measured at fair value at the end of each reporting period. The following table gives information about how the fair value of these financial assets and financial liabilities are determined (in particular, the valuation technique(s) and inputs used).

Financial asset/ financial liabilities	Valuation technique(s) and key input(s)	Significant unobservable input(s)	Relationship and sensitivity of unobservable inputs to fair value
Derivative financial instrument (Level 3)	Black-Scholes model The following variables were taken into consideration: current underlying price of the commodity, options strikeprice, time until expiration (expressed as a percent of a year), implied volatility of the commodity and LIBOR.	n/a	n/a

There were no transfers between Level 1 and 2 during the current or prior year.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
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20. Financial instruments continued

Reconciliation of Level 3 fair value measurements of financial instruments

The only financial assets measured subsequently at fair value on Level 3 fair value measurement represent contingent consideration relating to a business combination.

	£'000
Balance at 1 January 2018	–
Issues	**(753)**
Total gains or losses:	
– in profit or loss	110
Balance at 31 December 2018	**(643)**

Financial risk management objectives

The Group's policy is to manage the Group's financial risk, secure cost effective funding for the Group's operations and to minimise the adverse effects of fluctuations in the financial markets on the value of the Group's financial assets and liabilities, on reported profitability and on the cash flows of the Group.

The Group finances its activities with a combination of cash and treasury deposits. Other financial assets and liabilities, such as trade debtors and trade creditors, arise directly from the Group's operating activities.

Financial instruments give rise to foreign currency, interest rate, credit and liquidity risk. The Group's management of its exposure to credit risk is discussed in note 19 and to liquidity risk is discussed in note 23.

Interest rate risk

As the Group currently has no borrowings, its exposure to interest rate risk relates to the interest rate on its cash, cash equivalent and treasury deposit balances.

The Group's exposure has been calculated with reference to these balances as at the year end. A 2% increase or a reduction to 0% represents management's assessment of the reasonably possible change in interest rates.

If interest rates had been 2% higher/reduced to 0% and all other variables were held constant, the Group's profit for the year ended 31 December 2018 would increase by £0.6 million or decrease by £0.2 million (2017: increase by £0.9 million/decrease by £0.2 million). There would be no effect on equity reserves.

20. Financial instruments continued

Foreign currency risk

The Group receives approximately 35% of its revenues in US Dollars and 10% of its revenue in Euros, which are partially naturally hedged by supplies in these currencies, but the remainder requires conversion into Sterling in order to fund the remaining costs of the UK operations. The Group has R&D operations in Sweden, and therefore incurs costs and holds cash balances in Swedish Krona. In 2017, the Group had a manufacturing facility in Sweden which was closed in 2016 and legacy working capital balances denominated in Swedish Krona remain in the Group's Swedish companies prior to the dissolution of these entities.

The Group is mainly exposed to foreign currency risk resulting from transactions in US Dollars, Euros and Swedish Krona. The following table demonstrates the Group's sensitivity to a 10% increase and decrease in the Sterling exchange rate against the relevant foreign currencies on the Group's profit before tax and equity (due to changes in the fair value of monetary assets, liabilities and forward currency contracts). 10% represents management's assessment of the reasonably possible movement in exchange rates. The sensitivity analysis includes only outstanding foreign currency denominated monetary items and adjusts their translation at the period end for a 10% change in foreign currency rates. The sensitivity analysis includes inter Company balances within the Group where the denomination of the balance is in a currency other than the functional currency of the debtor or the creditor. A positive number below indicates an increase in profit or equity.

	Euro currency impact		US Dollar currency impact		Swedish Krona currency impact	
	2018 £'000	2017 £'000	**2018 £'000**	2017 £'000	**2018 £'000**	2017 £'000
Effect of a 10% increase in relevant exchange rate on:						
Profit or loss	**(229)**	(200)	**(1,024)**	(927)	**(22)**	(144)
Other equity	**–**	–	**(202)**	(289)	**40**	151
Effect of a 10% decrease in relevant exchange rate on:						
Profit or loss	**280**	245	**1,251**	1,132	**27**	176
Other equity	**–**	–	**247**	353	**(52)**	(185)

Capital risk management

The primary objective of the Group's capital management is to ensure that it maintains a strong credit rating and healthy capital ratios in order to support its business, maximise shareholder value and provide flexibility for value enhancing investments. The Group manages its capital structure and makes adjustments to it in light of changes in economic conditions or as a result of corporate strategy. To maintain or adjust the capital structure, the Group may adjust the dividend payment to shareholders, return capital to shareholders or issue new shares. In addition, any potential value enhancing investments may be funded through additional debt instruments. No changes were made in the objectives, policies or processes during the current or prior year, except for proposing no final dividend for 2018, as detailed in note 11 on page 106.

The Group monitors capital using a gearing ratio, which is determined as the proportion of debt to equity. Debt is defined as long and short term borrowings. Equity includes all capital and reserves of the Group attributable to the equity holders of the parent. The Group's policy for its existing business is to use debt where appropriate, whilst maintaining the gearing ratio at a level under 10%.

The gearing ratio at the year-end is as follows:

	2018 £'000	2017 £'000
Net debt	**–**	–
Equity	**131,884**	147,748
Gearing ratio	**0%**	0%

The Group is not subject to externally imposed capital requirements.

Credit risk management

Credit risk refers to the risk that a counterparty will default on its contractual obligations resulting in financial loss to the Group. The Group has adopted a policy of only dealing with creditworthy counterparties and obtaining sufficient collateral where appropriate, as a means of mitigating the risk of financial loss from defaults.

Trade receivables consist of a large number of customers, spread across different industries and geographical areas. Ongoing credit evaluation is performed on the financial condition of accounts receivable.

The credit risk on liquid funds is limited because the counterparties are banks with high credit ratings assigned by international credit rating agencies.

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21. Deferred tax

The following are the major deferred tax liabilities and assets recognised by the Group and movements thereon during the current and prior reporting periods:

	Accelerated tax depreciation £'000	Share-based payment £'000	Untaxed reserves £'000	Tax losses £'000	Other temporary difference £'000	Total £'000
At 1 January 2017	3,618	(496)	–	(204)	(232)	2,686
Charge/(credit) to income	1,601	(99)	–	99	(428)	1,173
Charge to equity	–	46	–	–	–	46
At 1 January 2018	**5,219**	**(549)**	**–**	**(105)**	**(660)**	**3,905**
(Credit)/charge to income	(162)	356	148	(3,306)	(114)	(3,078)
Charge to equity	–	43	–	–	–	43
At 31 December 2018	**5,057**	**(150)**	**148**	**(3,411)**	**(774)**	**870**

Certain deferred tax assets and liabilities have been offset. The following is the analysis of the deferred tax balances (after offset) for financial reporting purposes:

	2018 £'000	2017 £'000
Deferred tax liabilities	**870**	3,905

The decrease in the deferred tax liability arose from increased tax losses in the year.

As at 31 December 2018, the Group has unused capital losses of £1.1 million (2017: £1.1 million) available for offset against future gains. No deferred tax asset has been recognised in respect of these capital losses as it is not considered probable that there will be future chargeable gains available. These losses may be carried forward indefinitely.

22. Trade and other payables

	2018 £'000	2017 £'000
Trade payables and accruals	**18,958**	16,583

Trade payable and accruals principally comprise amounts outstanding for trade purchases and ongoing costs. The average credit taken for trade purchases is 45 days (2017: 28 days).

The Directors consider that the carrying amount of trade payables approximates to their fair value.

23. Other financial liabilities

Other financial liabilities consist of lease incentives.

The borrowings are repayable as follows:

	2018 £'000	2017 £'000
Within one year	**33**	30
In the second year	**31**	31
In the third to fifth years inclusive	**67**	71
Over five years	**5**	35
	136	167
Less: amount due for settlement within 12 months (shown under current liabilities)	**(33)**	(30)
Amount due for settlement after 12 months	**103**	137

The amounts included above are not considered to be materially different from the present value of their carrying amounts.

Liquidity risk

The Group aims to mitigate liquidity risk by managing cash generation by its operations and applying cash collection targets throughout the Group. Investment is carefully controlled, with authorisation limits operating up to Group Board level and cash payback periods applied as part of the investment appraisal process. In this way the Group aims to maintain a good credit rating to facilitate fund raising.

In its funding strategy, the Group's objective is to maintain a balance between continuity of funding and flexibility through the use of overdrafts, bank loans, finance leases and hire purchase contracts. The Group manages liquidity risk by maintaining adequate reserves and banking facilities by continuously monitoring cash flows and matching the maturity profiles of financial assets and liabilities.

Non-derivative financial liabilities of £19,094,000 (2017: £16,750,000) comprise trade creditors of £18,958,000 and lease incentives of £136,000. The trade creditors are within current liabilities. Of the lease incentives, £33,000 are within current liabilities and £103,000 within non-current liabilities with a range of maturity dates which are set out above. The inherent liquidity risk of these financial liabilities is managed within the overall liquidity risk of the Group as described above.

The Group is inherently a net generator of cash at the operating level. Excess cash used in managing liquidity is only invested in financial instruments exposed to insignificant risk of changes in market value, being placed on interest-bearing deposit with maturities no more than twelve months. Short term flexibility is achieved by overdraft facilities.

24. Provisions

	Warranty and commercial agreements £'000	Restructuring £'000	Total £'000
At 1 January 2017	159	615	774
Additional provision in the year	231	1,125	1,356
Utilisation of provision	(128)	–	(128)
Release of provision	(91)	–	(91)
At 1 January 2018	**171**	**1,740**	**1,911**
Additional provision in the year	592	891	1,483
Utilisation of provision	(105)	(2,339)	(2,444)
Release of provision	(451)	–	(451)
At 31 December 2018	**207**	**292**	**499**

The warranty and commercial agreements provision represents management's best estimate of the Group's liability related to claims against product warranties or commercial sales agreements. The timing of the utilisation of this provision is uncertain.

Additional restructuring provisions of £891,000 have been added primarily in relation to the reorganisation of the Printhead business unit whilst the utilisation of £2,339,000 relates to the consolidation of the office and research facilities in the Cambridge area, the closure of the manufacturing facility in Sweden in 2016, and the reorganisation of the Printhead business unit.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
for the year ended 31 December 2018

25. Share capital

	2018 £'000	2017 £'000
Issued and fully paid:		
78,334,296 (2017: 78,329,296) ordinary shares of 10.0p each	**7,833**	7,833

The Companies Act 2006 abolished the legal requirement for a Company to have an authorised share capital. The Articles of Association were amended to remove the authorised share capital article following approval via special resolution at the AGM on 19 May 2010.

The movement during the year on the Company's issued and fully paid shares was as follows:

	2018 Number	2017 Number	2018 £'000	2017 £'000
At beginning of year	**78,329,296**	77,776,755	**7,833**	7,778
Exercise of share options	**5,000**	552,541	**1**	55
At end of year	**78,334,296**	78,329,296	**7,833**	7,833

The Company has one class of ordinary shares which carry no right to fixed income.

Scheme	Date of grant	Number of shares under option as at 31 December 2018	Number of shares under option as at 31 December 2017	Subscription price per share
Xaar plc 2004 Share Option Plan	21 August 08	–	1,000	108.25p
	22 November 10	**10,000**	10,000	211p
	1 June 11	**65,000**	75,091	250p
	1 May 12	**100,000**	105,000	226.5p
		175,000	191,091	
Xaar plc Share Save Scheme	1 November 14	–	54,896	338p
	1 November 15	**79,176**	170,759	417p
	1 November 16	**45,129**	147,297	407p
		124,305	372,952	
Xaar plc 2017 Share Save Scheme	1 November 17	**96,933**	389,243	344p
	1 November 18	**918,341**	–	142p
		1,015,274	389,243	
Xaar plc 2013 Share Incentive Plan	17 April 13	**8,422**	13,796	0.0p
	16 April 14	**12,956**	15,973	0.0p
	14 April 16	**19,870**	23,070	0.0p
	13 April 17	**11,280**	12,174	0.0p
		52,528	65,013	
Total share options outstanding at 31 December		**1,367,107**	1,018,299	

Options granted under the Xaar plc 2004 Share Option Plan are ordinarily exercisable within three to ten years after the date of the grant.
The maximum value of approved options, under the Xaar plc 2004 Share Option Plan, which may be granted to individual employees is £30,000.

Options under the Xaar plc Share Save Scheme are ordinarily exercisable between 36 and 42 months after the date of the grant.

Awards under the Xaar plc Share Incentive Plan are ordinarily exercisable between three and five years after the date of the grant.

25. Share capital continued

Long Term Incentive Plan

Performance Share Awards outstanding under the Xaar plc 2007 Long Term Incentive Plan are as follows:

Date of grant	**Number of shares under option as at 31 December 2018**	Number of shares under option as at 31 December 2017
3 May 11	**7,081**	7,081
2 April 12	**60,417**	60,417
1 May 12	**79,564**	80,599
2 April 15	**184,628**	489,780
28 September 15	**9,033**	23,926
7 December 15	**12,088**	12,088
1 April 16	**370,759**	400,936
11 May 16	**57,018**	59,027
27 June 16	**18,000**	18,000
25 August 16	**57,710**	57,710
6 September 16	**8,250**	8,250
1 December 16	**22,640**	29,840
	887,188	1,247,654

All awards under this scheme are exercisable within three to ten years after the date of grant.

Performance share awards have been made under the Xaar plc 2017 Long Term Incentive Plan as follows:

Date of grant	**2018 Number of shares**	2017 Number of shares
16 May 17	**537,777**	745,291
3 April 18	**615,044**	–
1 June 18	**40,000**	–
	1,192,821	745,291

All awards under this scheme are exercisable within three to ten years after the date of grant.

26. Share premium account

	£'000
Balance at 1 January 2017	27,854
Premium arising on issue of equity shares	1,463
Balance at 1 January 2018	**29,317**
Premium arising on issue of equity shares	11
Balance at 31 December 2018	**29,328**

27. Own shares

	£'000
Balance as at 1 January 2017 and 1 January 2018	(3,642)
Sold in the year	529
Balance at 31 December 2018	**(3,113)**

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
for the year ended 31 December 2018

27. Own shares continued
Of this balance, £20,000 (2017: £20,000) represents 91,250 ordinary shares in Xaar plc held in trust by Xaar Trustee Ltd. Xaar Trustee Ltd was formed in 1995 to act as trustee to the Employee Benefit Trust established in 1995 to hold shares for the benefit of the employees of the Company and the Group. There has been no movement in the number of shares held in trust by Xaar Trustee Ltd during the year.

The remaining balance of £3,093,000 (2017: £3,622,000) represents the cost of 1,125,304 (2017: 1,317,727) shares in Xaar plc purchased in the market at market value and held by the Xaar plc ESOP trust to satisfy options granted under the Company's share option schemes.

The market value of own shares at 31 December 2018 was £1,765,000 (2017: £5,210,000).

28. Translation reserve

	£'000
Balance at 1 January 2017	807
Exchange differences on retranslation of net investment	(194)
Balance at 1 January 2018	**613**
Exchange differences on retranslation of net investment	204
Balance at 31 December 2018	**817**

Exchange differences relating to the translation of the net assets of the Group's foreign operations, which relate to subsidiaries only, from their functional currency into the parent's functional currency, being Sterling, are recognised directly in the translation reserve.

29. Retained earnings and other reserves

	Notes	Merger reserve £'000	Share-based payments £'000	Other reserves £'000	Total other reserves £'000	Retained earnings £'000	Total £'000
Balance at 1 January 2017		1,105	10,301	485	11,891	95,768	107,659
Net profit for the year		–	–	–	–	10,932	10,932
Dividends paid	11	–	–	–	–	(7,728)	(7,728)
Tax taken directly to equity		–	–	–	–	(20)	(20)
Exchange differences on retranslation of net investment		–	–	–	–	(527)	(527)
Movement in valuation of share options		–	2,747	–	2,747	–	2,747
Balance at 1 January 2018		**1,105**	**13,048**	**485**	**14,638**	**98,425**	**113,063**
Net loss for the year		–	–	–	–	(12,276)	(12,276)
Dividends paid	11	–	–	–	–	(6,009)	(6,009)
Tax taken directly to equity		–	–	–	–	(41)	(41)
Own shares sold in the period		–	–	–	–	(424)	(424)
Movement in valuation of share options		–	506	–	506	–	506
Balance at 31 December 2018		**1,105**	**13,554**	**485**	**15,144**	**79,675**	**94,819**

The merger reserve and other reserves are not distributable. The merger reserve represents the share premium account in Xaar Technology Limited.

The share-based payment reserve represents the cumulative charge made under IFRS 2 in relation to share options and LTIP awards. Other reserves represent the non-distributable portion of the dividend received in Xaar plc from Xaar Digital Limited.

30. Notes to the cash flow statement

	2018 £'000	2017 £'000
(Loss)/profit before tax	**(14,927)**	12,290
Adjustments for:		
Share-based payments	**235**	3,057
Depreciation of property, plant and equipment	**4,725**	7,795
Amortisation of intangible assets	**2,139**	1,149
Impairment of assets	**3,258**	–
Research and development expenditure credit	**(1,737)**	(411)
Investment income	**(170)**	(186)
Foreign exchange (gains)/losses	**(689)**	32
Other gains and losses	**(110)**	–
(Profit)/loss on disposal of property, plant and equipment	**(3)**	351
(Decrease)/increase in provisions	**(1,383)**	1,133
Operating cash flows before movements in working capital	**(8,662)**	25,210
Increase in inventories	**(12,817)**	(5,071)
Decrease/(increase) in receivables	**9,364**	(9,226)
Increase in payables	**2,724**	1,103
Cash (used in)/generated by operations	**(9,391)**	12,016
Income taxes (paid)/received	**(471)**	457
Net cash from operating activities	**(9,862)**	12,473

31. Operating lease arrangements

	2018 £'000	2017 £'000
Minimum lease payments under operating leases recognised as an expense in the year:		
Fixtures, fittings and equipment	**82**	93
Land and buildings	**1,692**	1,689
	1,774	1,782

At the date of the statement of financial position, the Group had outstanding commitments for future minimum lease payments under non-cancellable operating leases, which fall due as follows:

	Fixtures, fittings and equipment		Land and buildings	
	2018 £'000	2017 £'000	2018 £'000	2017 £'000
Within one year	**12**	76	**741**	1,539
In the second to fifth years inclusive	**17**	94	**2,262**	2,402
After five years	**–**	–	**116**	523
	29	170	**3,119**	4,464

The operating leases in respect of fixtures, fittings and equipment extend over a period of up to five years.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
for the year ended 31 December 2018

32. Share-based payments

Equity-settled share option scheme

The Company's share option schemes are open to all employees of the Group. Options are exercisable at a price equal to the average quoted market price of the Company's shares on the date of grant. The standard vesting period is three years.

An option granted under the Xaar plc 2004 Share Option Plan before 2011 will be exercisable over shares with a market value at the date of grant not exceeding a person's annual salary if at the third anniversary of grant the EPS growth of the Company since grant has exceeded the growth in the Retail Prices Index (RPI) over the same period by at least 12%. To the extent that an option relates to shares with a market value as at the date of grant in excess of a person's annual salary, the option will be exercisable over all of the excess shares if EPS growth over this period has exceeded RPI growth by at least 15%. For EPS performance between these two points, options will be exercisable over the excess shares on a sliding scale. In addition, options can only be exercised if EPS is at least 5.5p for the financial year preceding the third anniversary of grant. Performance may be retested once only from the date of grant to the fourth or fifth anniversary of grant (at the discretion of the Remuneration Committee), but the original EPS growth targets will be increased from 12/15% to 16/20% and 20/25% respectively. The 5.5p target will apply for the final financial year in the extended period.

An option granted under the Xaar plc 2004 Share Option Plan from 2011 onwards will be exercisable over shares with a market value at the date of grant not exceeding a person's annual salary, if at the third anniversary of grant, Xaar plc has achieved positive adjusted profit before tax as shown in the consolidated income statement in the Company's Annual Report and Accounts for any of the three years ending during the vesting period. One third of the shares subject to the option granted rounded to the nearest whole share, will vest based on the performance condition being met per year for each of the three years ending in the vesting period. If the adjusted profit before tax as shown in the consolidated income statement in Xaar plc's Annual Report and Accounts for any relevant year is restated before the option becomes exercisable, the restated figure shall, unless the Remuneration Committee determines otherwise, be applied in determining whether the above targets are met. In addition, options shall only become exercisable in respect of any shares if the committee in its absolute discretion determines that the overall financial performance of Xaar plc over the performance period is satisfactory.

The Xaar 2007 and 2017 Share Save Schemes provides an opportunity to all UK employees to save a set monthly amount (up to £500) over three years towards the exercise of a discounted share option, which is granted at the start of the three years.

The Xaar Share Incentive Plan provides an opportunity for all UK employees to buy shares from their pre-tax remuneration up to the limit permitted by the relevant tax legislation (£1,500 per year for the awards made in 2013 and 2014, £1,800 per year for awards made from 2015) and are awarded additional shares for free on a matching basis; the Company currently operates the plan on the basis of a 1:1 match but may award matching shares up to the maximum ratio permitted by the relevant tax legislation (currently a 2:1 ratio).

Options and awards under the Xaar 2007 and 2017 Share Save Schemes and Xaar Share Incentive Plan are not subject to performance conditions.

If the options remain unexercised after a period of ten years from the date of grant, or 42 months in the case of the Share Save Scheme, or five years in the case of the Share Incentive Plan (being the contractual lives), the options expire. Save as permitted in the share option scheme rules, options ordinarily lapse on an employee leaving the Group.

Details of the share options outstanding during the year are as follows:

		2018		2017
	Number of share options	**Weighted average exercise price (£)**	Number of share options	Weighted average exercise price (£)
Outstanding at beginning of year	**1,018,299**	**3.22**	1,280,204	3.14
Granted during the year	**931,141**	**1.42**	411,576	3.33
Lapsed during the year	**(535,097)**	**3.59**	(186,840)	3.83
Exercised during the year	**(47,236)**	**2.48**	(486,641)	3.10
Outstanding at the end of the year	**1,367,107**	**1.87**	1,018,299	3.22
Exercisable at the end of the year	**275,554**	**2.69**	275,756	2.30

The weighted average share price at the date of exercise for share options exercised during the period was £3.34 (2017: £4.58). The options outstanding at 31 December 2018 had a weighted average remaining contractual life of three years (2017: Three years). In 2018, options were granted on 1 November. The aggregate of the estimated fair values of the options granted on those dates is £0.82 million. In 2017, options were granted on 13 April and 1 November. The aggregate of the estimated fair values of the options granted on those dates is £0.61 million.

32. Share-based payments continued
Equity-settled share option scheme continued
The inputs into the Black-Scholes model are as follows:

	2018	2017
Weighted average share price	**£1.78**	£4.28
Weighted average exercise price	**£1.42**	£3.33
Weighted average expected volatility	**62%**	35%
Expected life	**3 years**	3 years
Risk-free rate	**1.00%**	0.50%
Weighted average expected dividends	**0.15%**	0.59%

Expected volatility was determined by calculating the historical volatility of the Group's share price over periods ranging from the previous one to three years. The expected life used in the model has been adjusted, based on management's best estimate, for the effects of non-transferability, exercise restrictions and behavioural considerations.

Long Term Incentive Plan
The Company's Long Term Incentive Plan is open to all employees of the Group.

All LTIP share awards granted before 2015 are subject to the achievement of EPS performance conditions, the number of shares that vest will depend on the EPS growth of the Company for the three financial years of the Company commencing on 1 January of the year of grant, as follows:

(1) None of the Awards will vest if the Company's EPS growth does not exceed growth in the Retail Prices Index (RPI) by at least 4% compound p.a.
(2) 35% of the Awards will vest if the Company's EPS growth exceeds growth in the RPI by at least 4% compound p.a.
(3) All of the Awards will vest if the Company's EPS growth exceeds growth in the RPI by at least 10% compound p.a.
(4) Awards will vest on a straight-line basis for EPS growth in excess of growth in the RPI of between 4% and 10% compound p.a.

LTIP share awards granted in 2015 onwards are subject to the achievement of different performance conditions depending on the level of the employee. The number of shares that vest will depend on for the three financial years of the Company commencing on 1 January of the year of grant, and are subject to one, two, three, four or five of the conditions as set out below:

(1) Absolute cumulative EPS performance over the period, whereby 25% of the Awards will vest if the threshold target is achieved, below threshold 0% will vest and up to a maximum of 100% if the maximum EPS target or higher is achieved.
(2) For 2015 and 2016 grants,TSR relative to FTSE TechMARK All Share Index, whereby 25% of the Awards will vest if the median rank in the comparator Group is achieved, below median 0% will vest and up to a maximum of 100% if the upper quartile or higher is achieved. For 2017 and 2018 grants,TSR outperformance multiplier determined by comparison to the FTSE Small Cap Index, whereby a performance multiplier of between 116.7% (for upper quartile performance) and 150% or 200% (for upper decile performance) is applied to the base award relating to awards granted with EPS and revenue performance conditions.
(3) Achievement of positive adjusted profit before tax as shown in the consolidated income statement in the Company's Annual Report and Accounts for any of the three years ending during the vesting period. One third of the shares subject to the option granted rounded to the nearest whole share, will vest based on the performance condition being met per year for each of the three years ending in the vesting period. If the adjusted profit before tax as shown in the consolidated income statement in Xaar plc's Annual Report and Accounts for any relevant year is restated before the option becomes exercisable, the restated figure shall, unless the Remuneration Committee determines otherwise, be applied in determining whether the above targets are met. In addition, options shall only become exercisable in respect of any shares if the Committee in its absolute discretion determines that the overall financial performance of Xaar plc over the performance period is satisfactory.
(4) From 2017, revenue growth over the period, whereby 25% of the Awards will vest if the threshold target is achieved, below threshold 0% will vest and up to a maximum of 100% if the maximum revenue growth target or higher is achieved.
(5) From 2018, revenue from new products in the third year in the vesting period, whereby 25% of the Awards will vest if the threshold target is achieved, below threshold 0% will vest and up to a maximum of 100% if the maximum revenue target or higher is achieved.

There are also a number of LTIP share awards granted that are subject to the achievement of different performance conditions for specific individuals, dependent on revenue or profit performance over a set performance period.

In addition, options shall only become exercisable in respect of any shares if the Committee in its absolute discretion determines that the overall financial performance of Xaar plc over the performance period is satisfactory. All awards that will vest will be calculated on a straight-line basis. All awards made under this scheme are exercisable within three to ten years after the date of grant. Save as permitted in the Long Term Incentive Plan rules, awards lapse on an employee leaving the Group.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
for the year ended 31 December 2018

32. Share-based payments continued
Long Term Incentive Plan continued

Key individuals have previously been invited to participate in a bonus matching scheme where matching LTIP share awards are granted when the employee invests their bonus in Xaar shares and retains ownership of these shares for the duration of the LTIP share award vesting period. The matching share award is a 1 for 1 match on the pre-tax value of the bonus used to acquire bonus investment shares. Matching LTIP share awards are subject to the same performance criteria as all other LTIP awards.

Details of performance share awards outstanding during the year are as follows:

	2018	2017
Awards outstanding at start of year	**1,992,945**	1,731,001
Granted during the year	**909,737**	770,091
Lapsed during the year	**(662,185)**	(432,023)
Exercised during the year	**(160,488)**	(76,124)
Awards outstanding at end of year	**2,080,009**	1,992,945
Exercisable at the end of the year	**352,811**	148,097

The weighted average share price at the date of exercise for awards exercised during the period was £2.76 (2017: £3.65). The options outstanding at 31 December 2018 had a weighted average remaining contractual life of eight years (2017: eight years). In 2018, Performance Share Awards were made on 3 April and 1 June. The aggregate of the estimated fair values of grants made on those dates is £2.2 million. In 2017, Performance Share Awards were made on 16 May. The aggregate of the estimated fair values of grants made on those dates is £2.8 million.

The estimated fair values for grants with non-market based performance conditions were calculated using the Black-Scholes model. The inputs into the Black-Scholes model were as follows:

	2018	2017
Weighted average share price	**£3.34**	£3.75
Weighted average exercise price	**£nil**	£nil
Weighted average expected volatility	**36%**	50%
Weighted average expected life	**3 years**	6 years
Weighted average risk free rate	**0.87%**	0.48%
Weighted average expected dividends	**3.05%**	0.67%

The estimated fair values for grants with market based performance conditions were calculated using the Monte Carlo model. The inputs into the Monte Carlo model were as follows:

	2018	2017
Weighted average share price	**£3.34**	£3.75
Weighted average exercise price	**£nil**	£nil
Weighted average expected volatility	**36%**	42%
Weighted average expected life	**4 years**	3 years
Weighted average risk free rate	**0.98%**	0.12%
Weighted average expected dividends	**3.05%**	2.66%

The Group recognised total expenses of £506,000 and £2,747,000 related to all equity-settled share-based payment transactions in 2018 and 2017, respectively.

33. Retirement benefit schemes

Defined contribution schemes

The UK based employees of the Group's UK companies have the option to be members of a defined contribution pension scheme managed by a third party pension provider. For each employee who is a member of the scheme the Company will contribute a fixed percentage of each employee's salary to the scheme. The only obligation of the Group with respect to this scheme is to make the specified contributions.

The total cost charged to the income statement in respect of these schemes during 2018 was £1,053,000 (2017: £1,216,000). As at 31 December 2018 contributions of £215,000 (2017: £128,000) due in respect of the current reporting period had not been paid over to the schemes.

34. Related party transactions

Transactions between the Company and its subsidiaries, which are related parties, have been eliminated on consolidation and are not disclosed in this note.

There were no transactions during the year with related parties who are not members of the Group.

Remuneration of key management personnel

The remuneration of the Directors, who are the key management personnel of the Group, is set out below in aggregate for each of the categories specified in IAS 24 "Related Party Disclosures". Further information about the remuneration of individual Directors is provided in the audited part of the Directors' Remuneration report on page 58.

	2018 £'000	2017 £'000
Short term employee benefits	**780**	1,195
Post-employment benefits	**71**	76
Share-based payments	**(140)**	597
	711	1,868

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NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS continued
for the year ended 31 December 2018

35. Non-controlling interest

Summarised financial information in respect of each of the Group's subsidiaries that has material non-controlling interest is set out below. The summarised financial information below represents amounts before intra-group eliminations. During the year the Group invested in Xaar 3D Limited, a newly formed Company. The Group owns 85% of Xaar 3D Limited with the remaining 15% held by a non-controlling interest.

Xaar 3D Limited

Statement of financial position	2018 £000
Current assets	9,347
Non-current assets	3,549
Current liabilities	(2,601)
Non-current liabilities	(143)
Equity attributable to owners of the Company	10,152
Non-controlling interests	1,523

Income statement and other comprehensive income	2018 £000
Revenue	60
Expenses	(472)
Loss for the year	(412)
Loss attributable to owners of the Company	(350)
Loss attributable to the non-controlling interests	(62)
Loss for the year	(412)
Total comprehensive loss attributable to owners of the Company	(350)
Total comprehensive loss attributable to the non-controlling interest	(64)
Total comprehensive loss for the year	(414)

Cash flow statement	2018 £000
Net cash inflow from operating activities	645
Net cash inflow from investing activities	4,580
Net cash inflow from financing activities	3,017
Net cash inflow	8,242

Non-controlling interest equity	2018 £000
Balance at 1 January 2017 and 1 January 2018	–
Adjustment arising from change in non-controlling interest	2,264
Share of loss for year	(64)
Balance at 31 December 2018	2,200

COMPANY BALANCE SHEET
as at 31 December 2018

	Notes	2018 £'000	2017 £'000
Fixed assets			
Investments	3	**32,062**	25,473
		32,062	25,473
Current assets			
Debtors – due within one year	4	**58,748**	61,733
Debtors – due after one year	4	**44**	135
Cash at bank and in hand		**245**	9,323
		59,037	71,191
Total assets		**91,099**	96,664
Creditors: amounts falling due within one year			
Trade and other payables	5	**(12,116)**	(11,859)
Provisions		**(78)**	–
		(12,194)	(11,859)
Net current assets		**46,843**	59,332
Total assets less current liabilities		**78,905**	84,805
Net assets		**78,905**	84,805
Capital and reserves			
Called up share capital	7	**7,833**	7,833
Share premium account	7	**29,328**	29,317
Other reserves		**35,729**	35,169
Own shares		**(3,093)**	(3,622)
Share-based payment reserve		**3,160**	3,214
Profit and loss account		**5,948**	12,894
Equity shareholders' funds		**78,905**	84,805

Xaar plc reported a loss for the financial year ended 31 December 2018 of £506,000 (2017: loss of £1,067,000).

The financial statements of Xaar plc, registered number 3320972, were approved by the Board of Directors and authorised for issue on 21 March 2019. They were signed on its behalf by:

Doug Edwards
Chief Executive Officer

Shomit Kenkare
Chief Financial Officer

FINANCIAL STATEMENTS

COMPANY STATEMENT OF CHANGES IN EQUITY
for the year ended 31 December 2018

	Notes	Called up share capital £'000	Share premium account £'000	Other reserves £'000	Own shares £'000	Share-based payments £'000	Profit and loss account £'000	Total £'000
At 1 January 2017		7,778	27,854	33,249	(3,622)	2,387	21,695	89,341
Loss for the financial year		–	–	–	–	–	(1,067)	(1,067)
Total comprehensive income for the period		–	–	–	–	–	(1,067)	(1,067)
New shares issued		55	1,463	–	–	–	–	1,518
Dividends paid	6	–	–	–	–	–	(7,728)	(7,728)
Deferred tax on share-based payment transactions		–	–	–	–	–	(6)	(6)
Capital contribution for share-based payments	3	–	–	1,920	–	–	–	1,920
Share-based payments		–	–	–	–	827	–	827
At 1 January 2018		**7,833**	**29,317**	**35,169**	**(3,622)**	**3,214**	**12,894**	**84,805**
Loss for the financial year		–	–	–	–	–	(506)	(506)
Total comprehensive income for the period		–	–	–	–	–	(506)	(506)
New shares issued		–	11	–	–	–	–	11
Own shares sold in the period		–	–	–	529	–	–	529
Dividends paid	6	–	–	–	–	–	(6,009)	(6,009)
Share option exercises		–	–	–	–	–	(424)	(424)
Deferred tax on share-based payment transactions		–	–	–	–	–	(7)	(7)
Capital contribution for share-based payments	3	–	–	560	–	–	–	560
Share-based payments		–	–	–	–	(54)	–	(54)
At 31 December 2018		**7,833**	**29,328**	**35,729**	**(3,093)**	**3,160**	**5,948**	**78,905**

The share premium account and other reserves are non-distributable.

Other reserves represent the profit from the sale of a subsidiary, the non-distributable portion of the dividend received in Xaar plc from Xaar Digital Limited and the capital contribution to investments relating to share-based payments.

The share-based payment reserve represents the cumulative charge made under IFRS 2 in relation to share options and LTIP awards.

Full details of share capital, share premium and own shares are given in notes 25, 26 and 27 to the consolidated financial statements.

NOTES TO THE COMPANY FINANCIAL STATEMENTS
for the year ended 31 December 2018

1. Significant accounting policies
Basis of accounting
The separate financial statements of the Company are presented as required by the Companies Act 2006 and in accordance with FRS 101 (Financial Reporting Standard 101) 'Reduced Disclosure Framework' as issued by the Financial Reporting Council. The results of Xaar plc are included in the consolidated financial statements of Xaar plc.

As permitted by FRS 101, the Company has taken advantage of the disclosure exemptions available under that standard in relation to share-based payments, financial instruments, capital management, presentation of comparative information in respect of certain assets, presentation of a cash flow statement and certain related party transactions.

Where required, equivalent disclosures are given in the consolidated financial statements of Xaar plc.

The financial statements have been prepared under the historical cost convention.

The principal accounting policies adopted are the same as those set out in note 3 of the consolidated financial statements except as noted below. They have all been applied consistently throughout the year and the preceding year.

Investments
Fixed asset investments in subsidiaries are shown at cost less provision for impairment and capital related to share-based payments. Contributions in respect of share-based payments are recognised in line with the policy set out in note 32.

For investments in subsidiaries acquired for consideration, including the issue of shares qualifying for merger relief, cost is measured by reference to the nominal value only of the shares issued. Any premium is ignored.

Bonds with fixed or determinable payments and fixed maturity dates that the Group has the positive intent and ability to hold to maturity are classified as held-to-maturity investments and are measured at amortised cost using the effective interest method less any impairment.

Dividends
Dividend income is recognised when an irrevocable right to receive payment has been established provided that it is probable that the economic benefits will flow to the Company and the amount of income can be measured reliably.

2. Loss for the year
As permitted by section 408 of the Companies Act 2006, the Company has elected not to present its own profit and loss account for the year.

The average number of employees throughout 2018 was 34 (2017: 47). Staff costs amounted to £2.5 million (2017: £2.8 million). Information about the remuneration of Directors is provided in the audited part of the Directors' Remuneration report on page 58. For the remuneration of key management personnel of the Company see note 34 of the consolidated financial statements.

The audit fee for the audit of the Company's financial statements in 2018 was £22,000 (2017: £22,000).

3. Fixed and current asset investments

	2018 £'000	2017 £'000
Subsidiary undertakings		
At beginning of the year	**25,473**	23,547
Additions in the year	**6,035**	6
Disposals in the year	**(6)**	–
Capital contributions arising from share-based payments	**560**	1,920
At end of the year	**32,062**	25,473
Held-to-maturity investments		
At beginning of the year	**–**	1,000
Disposals during the year	**–**	(1,000)
At end of the year	**–**	–

The Directors believe that the carrying value of the investments is supported by their underlying net assets.

Held-to-maturity investments represented investment in bonds returning interest at 3% per annum, which were due to mature on 22 November 2018. The option to redeem the bonds was exercised on 21 November 2017.

NOTES TO THE COMPANY FINANCIAL STATEMENTS continued
for the year ended 31 December 2018

4. Debtors

	2018 £'000	2017 £'000
Amounts receivable within one year		
Amounts owed by Group undertakings	**58,748**	61,731
Prepayments and accrued income	**–**	2
	58,748	61,733
Amounts receivable after more than one year		
Deferred tax asset (see below)	**44**	135
	58,792	61,868

	2018 £'000	2017 £'000
Deferred tax asset at 1 January	**135**	139
Deferred tax movement on share option	**(91)**	(4)
Deferred tax asset at 31 December	**44**	135
Deferred tax asset due within one year	**–**	–
Deferred tax asset due after more than one year	**44**	135
	44	135

Amounts owed by Group undertakings are trading balances under normal commercial terms and interest is not charged.

The Finance (No 2) Act 2015, provided for a reduction in the main rate of corporation tax from 20% to 19% effective from 1 April 2017, and a reduction to 18% effective from 1 April 2020. Finance Act 2016 provides for a further reduction in the main rate of corporation tax to 17% effective from 1 April 2020. These rate reductions have been reflected in the calculation of deferred tax at the balance sheet date.

The deferred tax asset relates to amounts recognised in respect of share-based payments.

5. Creditors

	2018 £'000	2017 £'000
Amounts falling due within one year		
Amounts owed to Group undertakings	**11,862**	11,293
Accruals	**253**	566
	12,115	11,859

Amounts owed to Group undertakings are trading balances under normal commercial terms and interest is not charged.

For additional disclosures relating to financial liabilities, see note 23 to the consolidated financial statements.

6. Dividends

	2018 £'000	2017 £'000
Amounts recognised as distributions to equity holders in the period:		
Final dividend for the year ended 31 December 2017 of 6.8 pence (2016: 6.7 pence) per share	**5,238**	5,126
Interim dividend for the year ended 31 December 2018 of 1.0 pence (2017: 3.4 pence) per share	**771**	2,602
Total distributions to equity holders in the period	**6,009**	7,728
Proposed final dividend for the year ended 31 December 2018 of nil (2017: 6.8 pence) per share	**–**	5,326

7. Share capital and share premium account

Full details of movements in share capital and the share option schemes, and share premium are given in notes 25 and 26 to the consolidated financial statements.

8. Share-based payments

Equity-settled share option scheme

The Company's share option schemes are open to all employees of the Company. Options are exercisable at a price equal to the average quoted market price of the Company's shares on the date of grant. The vesting period is three years. The vesting criteria of these options are disclosed in note 32 to the consolidated financial statements. If the options remain unexercised after a period of ten years from the date of grant, 42 months in the case of the Share Save Scheme, or five years in the case of the Share Incentive Plan, the options expire. Save as permitted in the share option scheme rules, options lapse on an employee leaving the Company.

The weighted average share price at the date of exercise for share options exercised during the period was £3.01 (2017: £3.94). The options outstanding at 31 December 2018 had a weighted average remaining contractual life of nine years (2017: three years), and a range of exercise prices between 0 pence and 417 pence (2017: 0 pence and 417 pence).

The performance conditions relating to the above share options and the exercise prices of options outstanding at the year-end are given in note 32 to the consolidated financial statements.

Long Term Incentive Plan

The Company's Long Term Incentive Plan is open to all employees of the Company. Vesting of Performance Share Awards made under this scheme is conditional upon the achievement of performance conditions. Full details of the performance conditions are shown in note 32 of the consolidated financial statements. All awards made under this scheme are exercisable within three to ten years after the date of grant. Save as permitted in the Long Term Incentive Plan rules, awards lapse on an employee leaving the Company.

The weighted average share price at the date of exercise for awards exercised during the period was £3.40 (2017: £3.60). The awards outstanding at 31 December 2018 had a weighted average remaining contractual life of eight years (2017: nine years). All awards have a £nil exercise price.

9. Subsidiary undertakings

The following entities are the subsidiary undertakings of the Company:

Name	Country of incorporation	Address of registered office	Principal activity	Issued and fully paid up share capital	Proportion of ordinary share capital held by the Company
Xaar Technology Limited	England & Wales	Science Park, Cambridge, CB4 0XR	Research and development	4,445,322 ordinary £1 shares	100%
XaarJet Limited	England & Wales	Science Park, Cambridge, CB4 0XR	Manufacturing, research and development and sales and marketing	2 ordinary £1 shares	100%
XaarJet (Overseas) Limited	England & Wales	Science Park, Cambridge, CB4 0XR	Sales and marketing	1 ordinary £1 share	100%
Xaar Trustee Limited[1]	England & Wales	Science Park, Cambridge, CB4 0XR	Trustee	2 ordinary £1 shares	100%
Xaar Digital Limited	England & Wales	Science Park, Cambridge, CB4 0XR	Treasury	100 ordinary £1 shares	100%
Xaar 3D Holdings Limited	England & Wales	Science Park, Cambridge, CB4 0XR	Holding Company	1,100 ordinary shares of £0.01 each	100%
Xaar 3D Limited[2]	England & Wales	Science Park, Cambridge, CB4 0XR	Manufacturing, research and development	2,000 ordinary shares of £0.01 each	85%
Xaar 3D ApS[3]	Denmark	c/o Bygning OBV 028, Otto Busses Vej 5 A,1. sal., 2450 Kobenhavn SV, Denmark	Research and development	500 ordinary shares of DKK 100 each	85%
Xaar Group AB	Sweden	Science Park, Cambridge, CB4 0XR	Holding Company	1,137,000 ordinary shares of SEK 0.09 each	100%
XaarJet AB[4]	Sweden	Science Park, Cambridge, CB4 0XR	Manufacturing	1,000 ordinary shares of SEK 100 each	100%
Xaar US Holdings Inc.	USA	1209 Orange Street, Wilmington, New Castle County, Delaware, USA	Holding Company	6,000 shares of common stock US$1 each	100%
Engineered Printing Solutions[5]	USA	201 Tennis Way, East Dorset, VT 05253, USA	Manufacturing, sales and marketing	100 shares of common stock US$1 each	100%
Xaar Americas Inc.[5]	USA	1000 Post and Paddock, Suite 405, Grand Prairie, TX 75050, USA	Sales and marketing	10,000 shares of common stock US$1 each	100%

1 Xaar Trustee Limited shares are held by Xaar Technology Limited.
2 Xaar 3D Limited shares are held by Xaar 3D Holdings Limited.
3 Xaar 3D ApS shares are held by Xaar 3D Limited.
4 XaarJet AB shares are held by Xaar Group AB.
5 Xaar Americas Inc and Engineering Printing Solutions are held by Xaar US Holdings Inc.

FINANCIAL STATEMENTS

FIVE YEAR RECORD

	2018 £'000	2017 £'000	2016 £'000	2015 £'000	2014 £'000
Summarised consolidated results					
Results					
Revenue	**63,534**	100,142	96,178	93,472	109,150
Gross profit	**24,449**	47,045	44,667	44,690	48,602
Adjusted (loss)/profit before tax	**(11,721)**	18,012	19,482	20,819	24,610
Adjusted (loss)/profit after tax	**(7,483)**	16,413	16,587	19,024	20,229
Adjusted diluted earnings per share	**(9.7p)**	20.7p	21.2p	24.5p	26.4p
Adjusted basic earnings per share excluding the impact of IAS 38	**(10.3p)**	15.6p	11.0p	17.0p	17.2p
Dividends pence per share	**1.0p**	10.2p	10.0p	9.45p	9.0p
Assets employed					
Net cash*	**27,946**	44,697	49,321	69,747	46,963

* Net cash is made up of cash and cash equivalents, treasury deposits less borrowings.

NOTICE OF THE ANNUAL GENERAL MEETING

Notice is hereby given that the twenty-second Annual General Meeting ('AGM') of Xaar plc (the 'Company') will be held at Xaar plc, 316 Science Park, Milton Road, Cambridge, CB4 0XR on Tuesday 21 May 2019 at 9:30am for the following purposes:

Ordinary business

To consider and, if thought fit, pass the following resolutions which will be proposed as Ordinary Resolutions:

1. To receive the Company's annual financial statements for the financial year ended 31 December 2018.
2. To reappoint Deloitte LLP as auditor to hold office from the conclusion of this meeting until the conclusion of the next general meeting of the Company at which Financial Statements are laid.
3. To authorise the Directors to determine the remuneration of the auditors.
4. To re-elect Doug Edwards as a Director.
5. To re-elect Andrew Herbert as a Director.
6. To re-elect Shomit Kenkare as a Director.
7. To re-elect Chris Morgan as a Director.
8. To re-elect Margaret Rice-Jones as a Director.
9. To re-elect Robin Williams as a Director.
10. To approve the Directors' Remuneration report (excluding the Directors' remuneration policy which is set out on pages 67 to 71 of the Annual Report) for the year ended 31 December 2018.

Special business

To consider and, if thought fit, pass the following resolutions which will be proposed in the case of Resolutions 11 and 13 as Ordinary Resolutions and in the case of Resolutions 12 and 14 as Special Resolutions:

11. That the Company be authorised, subject to and in accordance with the provisions of the Companies Act 2006 (the 'Act'), to send, convey or supply all types of notices, documents or information to the shareholders by means of electronic equipment for the processing (including digital compression), storage and transmission of data, employing wires, radio optical technologies or any other electromagnetic means, including by making such notices, documents or information available on a website and this Resolution will supersede any provision in the Company's articles of association to the extent that it is inconsistent with this Resolution.
12. That the Company be generally and unconditionally authorised for the purposes of section 701 of the Companies Act 2006 (the 'Act') to make one or more market purchases (within the meaning of section 693(4) of the Act) of ordinary shares of 10p in the capital of the Company (ordinary shares) provided that:
    - the maximum aggregate number of ordinary shares authorised to be purchased is 11,671,810 (representing 14.9% of the issued ordinary share capital);
    - the minimum price (excluding expenses) which may be paid for an ordinary share is the par value of the shares;
    - the maximum price (excluding expenses) which may be paid for an ordinary share is an amount equal to the higher of (i) 105% of the average of the middle market quotations for an ordinary share as derived from the London Stock Exchange Daily Official List for the five business days immediately preceding the day on which that ordinary share is purchased, and (ii) the amount stipulated by article 5(1) of the Buy-back and Stabilisation Regulation 2003;
    - this authority shall expire at the conclusion of the next Annual General Meeting of the Company, or, if earlier, at the close of business on the date which is 15 months after the passing of this resolution unless renewed, revoked or varied before that time; and
    - the Company may make a contract to purchase ordinary shares under this authority before the expiry of the authority which will or may be executed wholly or partly after the expiry of the authority, and may make a purchase of ordinary shares in pursuance of any such contract.
13. That, in substitution for all existing authorities including the authority conferred on the Directors by Article 4(b) of the Company's Articles of Association, in accordance with section 551 of the Act the Directors be and they are generally and unconditionally authorised to exercise all powers of the Company to allot equity securities (within the meaning of section 560 of the Act), or grant rights to subscribe for, or convert any security into, shares in the Company:
    (a) up to an aggregate nominal amount of £5,222,286.40 (such amount to be reduced by the nominal amount of any equity securities allotted pursuant to the authority in Resolution 13(b)) in connection with a rights issue (as defined in the Listing Rules issued by the Financial Conduct Authority pursuant to Part VI of the Financial Services and Markets Act 2000), to holders of equity securities, in proportion to their respective entitlements to such equity securities, but subject to such exclusions or other arrangements as the Directors may deem necessary or expedient in relation to treasury shares, fractional entitlements, record dates, legal or practical problems in or under the laws of any territory or the requirements of any regulatory body or stock exchange; and
    (b) otherwise up to an aggregate nominal amount of £2,611,143.20 (such amount to be reduced by the nominal amount of any equity securities allotted pursuant to the authority in Resolution 13(a)), provided that this authority shall expire at the conclusion of the next Annual General Meeting of the Company, or, if earlier, at the close of business on the date which is 15 months after the passing of this resolution, save that the Company may before such expiry make an offer or agreement which would or might require equity securities to be allotted after such expiry and the Directors may allot such equity securities in pursuance of such an offer or agreement as if the authority conferred by this resolution had not expired.

NOTICE OF THE ANNUAL GENERAL MEETING continued

Special business continued

14. Subject to the passing of Resolution 13 of the notice of meeting, that, in substitution for all existing authorities, including the authority conferred on the Directors by Article 4(c) of the Company's Articles of Association:
    (a) the Directors be and they are empowered pursuant to section 570 of the Act to allot equity securities pursuant to the authority conferred by Resolution 13(a) as if section 561 of the Act did not apply to any such allotment, provided that this authority shall be limited to the allotment of equity securities in connection with a rights issue (as defined in the Listing Rules issued by the Financial Conduct Authority pursuant to Part VI of the Financial Services and Markets Act 2000) but subject to such exclusions or other arrangements as the Directors may deem necessary or expedient in relation to treasury shares, fractional entitlements, record dates, legal or practical problems in or under the laws of any territory or the requirements of any regulatory body or stock exchange; and
    (b) the Directors be and they are empowered pursuant to section 570 of the Act to allot equity securities for cash pursuant to the authority conferred by Resolution 13(b) as if section 561 of the Act did not apply to any such allotment, provided that this authority shall be limited to the allotment of equity securities (otherwise than in connection with any rights issue (as defined in the Listing Rules issued by the Financial Conduct Authority pursuant to Part VI of the Financial Services and Markets Act 2000)):
    (i) up to an aggregate nominal value of up to £391,671.40 (being the nominal value of approximately 5% of the issued share capital of the Company); and
    (ii) up to a further maximum aggregate nominal value of £391,671.40 (being the nominal value of 5% of the issued share capital of the Company) provided that it is used only in connection with an acquisition or a specified capital investment, provided that this authority shall expire at the conclusion of the next Annual General Meeting of the Company, or, if earlier, at the close of business on the date which is 15 months from the passing of this resolution, save that the Company may before such expiry make an offer or agreement which would or might require equity securities to be allotted after such expiry and the Directors may allot equity securities in pursuance of such an offer or agreement as if the authority conferred by this resolution had not expired.

By order of the Board

Camila Cottage
Company Secretary

21 March 2019

Notes

1. A member entitled to attend and vote at the meeting may appoint one or more proxies to exercise all or any of the member's rights to attend, speak and vote at the meeting. A proxy need not be a member of the Company but must attend the meeting for the member's vote to be counted. If a member appoints more than one proxy to attend the meeting, each proxy must be appointed to exercise the rights attached to a different share or shares held by the member. If a member wishes to appoint one or more proxies they may do so at www.signalshares.com, if not already registered you will need your Investor code to do so, this can be found on your share certificate. If paper proxy forms are required, the member should contact the registrars' helpline on 0871 664 0300 (calls cost 12p per minute plus network extras). If you are outside the United Kingdom, please call +44 371 664 0300 (calls will be charged at the applicable international rate). We are open between 9.00 a.m. – 5.30 p.m., Monday to Friday excluding public holidays in England and Wales. Submission of a proxy vote shall not preclude a member from attending and voting in person at the meeting in respect of which the proxy is appointed or at any adjournment thereof.
2. To be effective, the proxy vote must be submitted at www.signalshares.com so as to have been received by the Company's registrars not less than 48 hours (excluding weekends and public holidays) before the time appointed for the meeting or any adjournment of it. Any power of attorney or other authority under which the proxy is submitted must be returned to the Company's registrars, Link Asset Services, PXS1, 34 Beckenham Road, Beckenham, Kent, BR3 4ZF. If a paper form of proxy is requested from the registrar, it should be completed and returned to Link Asset Services, PXS1, 34 Beckenham Road, Beckenham, Kent, BR3 4ZF to be received not less than 48 hours before the time of the meeting.
3. Any person to whom this notice is sent who is a person nominated under section 146 of the Companies Act 2006 to enjoy information rights (a 'Nominated Person') may, under an agreement between him/her and the shareholder by whom he/she was nominated, have a right to be appointed (or to have someone else appointed) as a proxy for the Annual General Meeting. If a Nominated Person has no such proxy appointment right or does not wish to exercise it, he/she may, under any such agreement, have a right to give instructions to the shareholder as to the exercise of voting rights.
4. The statement of the rights of shareholders in relation to the appointment of proxies in paragraphs 1 and 2 above does not apply to Nominated Persons. The rights described in these paragraphs can only be exercised by shareholders of the Company.
5. In accordance with Regulation 41 of the Uncertified Securities Regulations 2001, the Company specifies that only those members entered on the register of members of the Company as at close of business on 17 May 2019 (or in the event the meeting is adjourned, on the register of members 48 hours before the time of any adjourned meeting) shall be entitled to attend or vote at the meeting in respect of the number of shares registered in their name at that time. Changes to entries on the register of members after close of business on 17 May 2019 (or in the event the meeting is adjourned, on the register of members less than 48 hours before the time of any adjourned meeting) shall be disregarded in determining the rights of any person to attend or vote at the meeting.
6. Copies of Directors' service agreements, the terms of appointment of Non-Executive Directors, the register of Directors' interests kept by the Company under section 808 of the Companies Act 2006, the Xaar plc 2004 Share Option Plan, the Xaar plc 2007 Share Save Plan, the Xaar plc 2017 Share Save Plan, Xaar plc 2007 Long Term Incentive Plan, the Xaar Share Incentive Plan and the Xaar 2017 Long Term Incentive Plan will be available 15 minutes prior to the commencement of the meeting and will remain open and accessible during the continuance of the meeting to any person attending the meeting.
7. Biographical details of all Directors offering themselves for re-appointment are set out on pages 38 and 39 of the Annual Report and Accounts.
8. Shareholders should note that it is possible that, pursuant to requests made by shareholders of the Company under section 527 of the Companies Act 2006, the Company may be required to publish on a website a statement setting out any matter relating to: (i) the audit of the Company's accounts (including the auditor's report and the conduct of the audit) that are to be laid before the Annual General Meeting; or (ii) any circumstance connected with an auditor of the Company ceasing to hold office since the previous meeting at which annual accounts and reports were laid in accordance with section 437 of the Companies Act 2006. The Company may not require the shareholders requesting any such website publication to pay its expenses in complying with sections 527 or 528 of the Companies Act 2006. Where the Company is required to place a statement on a website under section 527 of the Companies Act 2006, it must forward the statement to the Company's auditor not later than the time when it makes the statement available on the website. The business which may be dealt with at the Annual General Meeting includes any statement that the Company has been required under section 527 of the Companies Act 2006 to publish on a website.
9. In order to facilitate voting by corporate representatives at the meeting, arrangements will be put in place at the meeting so that: (i) if a corporate shareholder has appointed the Chairman of the meeting as its corporate representative to vote on a poll in accordance with the directions of all of the other corporate representatives for that shareholder at the meeting, then on a poll those corporate representatives will give voting directions to the Chairman and the Chairman will vote (or withhold a vote) as corporate representative in accordance with those directions; and (ii) if more than one corporate representative for the same corporate shareholder attends the meeting but the corporate shareholder has not appointed the Chairman of the meeting as its corporate representative, a designated corporate representative will be nominated, from those corporate representatives who attend, who will vote on a poll and the other corporate representatives will give voting directions to that designated corporate representative. Corporate shareholders are referred to in the guidance issued by the Institute of Chartered Secretaries and Administrators on proxies and corporate representatives (www.icsa.org.uk) for further details of this procedure. The guidance includes a sample form of appointment letter if the Chairman is being appointed as described in (i) above.
10. CREST members who wish to appoint a proxy or proxies through the CREST electronic proxy appointment service may do so by using the procedures described in the CREST Manual. CREST Personal Members or other CREST sponsored members, and those CREST members who have appointed a service provider(s), should refer to their CREST sponsor or voting service provider(s), who will be able to take the appropriate action on their behalf.

NOTICE OF THE ANNUAL GENERAL MEETING continued

Notes continued

11. In order for a proxy appointment or instruction made using the CREST service to be valid, the appropriate CREST message (a 'CREST Proxy Instruction') must be properly authenticated in accordance with CRESTCo's specifications, and must contain the information required for such instruction, as described in the CREST Manual. The message, regardless of whether it constitutes the appointment of a proxy or is an amendment to the instruction given to a previously appointed proxy must, in order to be valid, be transmitted so as to be received by the issuer's agent (ID RA10) by 9:30 am on 19 May 2019. For this purpose, the time of receipt will be taken to be the time (as determined by the timestamp applied to the message by the CREST Application Host) from which the issuer's agent is able to retrieve the message by enquiry to CREST in the manner prescribed by CREST. After this time any change of instructions to proxies appointed through CREST should be communicated to the appointee through other means.
12. CREST members and, where applicable, their CREST sponsors, or voting service providers should note that CRESTCo does not make available special procedures in CREST for any particular message. Normal system timings and limitations will, therefore, apply in relation to the input of CREST Proxy Instructions. It is the responsibility of the CREST member concerned to take (or, if the CREST member is a CREST personal member, or sponsored member, or has appointed a voting service provider, to procure that his CREST sponsor or voting service provider(s) take(s)) such action as shall be necessary to ensure that a message is transmitted by means of the CREST system by any particular time. In this connection, CREST members and, where applicable, their CREST sponsors or voting system providers are referred, in particular, to those sections of the CREST Manual concerning practical limitations of the CREST system and timings.
13. The Company may treat as invalid a CREST Proxy Instruction in the circumstances set out in Regulation 35(5)(a) of the Uncertificated Securities Regulations 2001 (as amended).
14. As at 7.00am on 21 March 2019, the Company's issued share capital comprised 78,334,296 ordinary shares of 10p each. Each ordinary share carries the right to one vote at a general meeting of the Company, except for the shares held in trust for the Xaar Share Incentive Plan totalling 113,208 ordinary shares and, therefore, the total number of voting rights in the Company as at 7.00am on 21 March 2019 is 78,221,088.
15. Any member attending the meeting has the right to ask questions. The Company must answer any such question relating to the business being dealt with at the meeting but no such answer need be given if: (a) to do so would interfere unduly with the preparation for the meeting or involve the disclosure of confidential information; (b) the answer has already been given on a website in the form of an answer to a question; or (c) it is undesirable in the interests of the Company or the good order of the meeting that the question be answered.
16. You may vote your shares electronically at www.signalshares.com. On the home page, search "Xaar plc" and then log in or register, using your Investor Code. To vote, click on the "Vote Online Now" button.
17. A copy of this Notice, and other information required by section 311A of the Companies Act 2006, can be found at www.xaar.com.

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Registered number
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