

XAAR®

# Corporate Overview

June 2017



# Overview

Xaar is a world leader in the development of inkjet technology and the leading independent manufacturer of industrial inkjet printheads

- Founded in 1990 – 25 years of inkjet innovation
- 1997 London Listing (XAR)
- 2016 Turnover: £96.2m
- Over 250 patents granted/pending
- Licensees include Konica Minolta, Seiko and Toshiba Tec
- HQ – Science Park, Cambridge, UK
- Manufacturing – Xaar: Huntingdon, UK EPS: Vermont, USA
- Regional offices – Hong Kong, India, USA



# Delivering transformational solutions



## Xaar designs

Xaar invests a substantial proportion of sales (over 20% in 2016) in R&D to remain the world leader in inkjet technology. Xaar's innovative products are used in a wide range of applications around the world, from ceramic tiles to semi-conductors.



## Xaar manufactures

Xaar's manufacturing is relatively capital intensive; the Group has invested over £60 million in assets and production facilities in Huntingdon since the plant opened in 2007. EPS, a Xaar company, manufactures customised and bespoke printing solutions in Vermont, USA.



## Xaar sells

Xaar sells direct to OEMs around the world through its global sales team. 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.



## Xaar markets

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

Primary markets include wide-format graphics, ceramics tiles, labels, packaging, coding and marking, 3D printing, advanced manufacturing and decorative laminates and glass.



# Where we excel

## Technology Choice

- Choice of technologies and printheads for a wide range of applications
- Strong development roadmap and R&D investment
- Development partnerships

## Customer Collaboration

- Global reach with strong regional collaboration
- Excellent customer service and support
- Strong technical and integration expertise

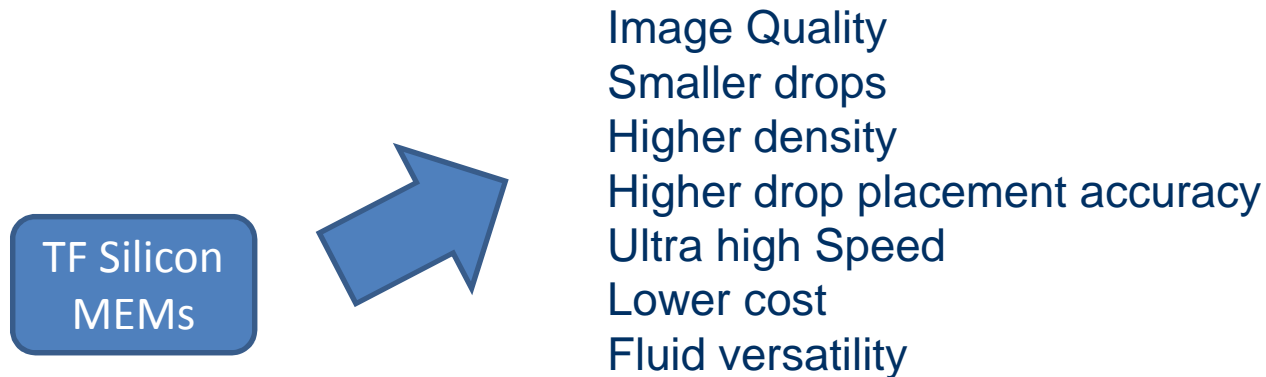
## Open Approach

- Open systems approach – the widest range of ink & fluid options
- Supportive approach with development and waveform tools
- Collaborative business models and partnerships



# Application requirements & fit

## COMMERCIAL



Higher Viscosity  
Larger drops  
Higher laydown  
Larger particle sizes  
Higher throw distance  
Higher temperature operation  
Lifetime (currently)

## INDUSTRIAL



# Business performance

- Total revenue grew by 3% in 2016 to **£ millions** 2011 2012 2013 2014 2015 2016  
£96.2m (£93.5m in 2015)
- Operating profit margin of 20% achieved for the year
- Net cash £49.3m (reduced from £69.7m in 2015 through investments in capital expenditure and acquisition of EPS)

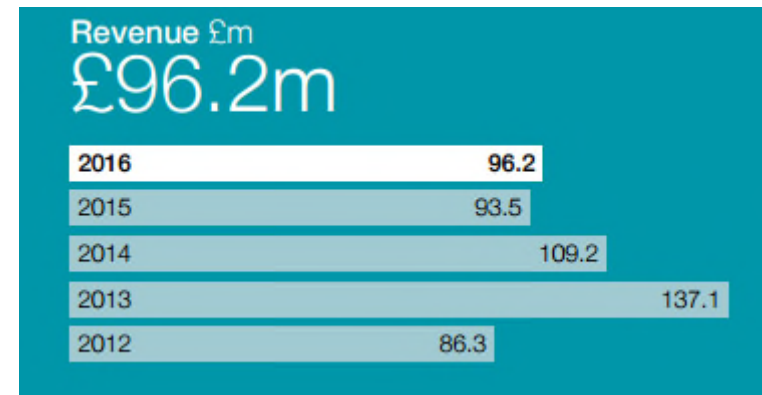
Revenues	68.7	86.3	137.1	109.2	93.5	96.25
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- Revenues by Region

- EMEA £41.7m
- Asia £36.4m
- Americas £18.1m

- Business by Sector

- Industrial £53.3m
- Packaging £21.7m
- Graphic Arts £7.9m
- Other £13.3m





# Facilities

- Production in Huntingdon, UK
- 5,000m<sup>2</sup> cleanroom
- ISO 9001; ISO 14001
- Sales / Support Offices:
  - EMEA: Cambridge, HQ - R&D, sales & marketing, business support
  - USA: Texas
  - China: Hong Kong
  - India: Haryana
- EPS – Engineering Printing Solutions  
Vermont, USA
- Approved Distributors include:
  - Europe: Big Fish
  - Japan: Kawasaki
  - Middle East: Honaz
  - Russia: AT Design
  - Ukraine: IPS Distribution



# Printheads – Bulk technology



Xaar 128



Xaar 501 GS8



Xaar 502 GS15



Xaar 5501



Xaar 1003 AMP & AMx



Xaar 1003 GS6, GS12, GS40



Xaar 2001 GS12, Xaar 2001+ GS6, GS12, GS40





# Printheads – Thin film technology



Xaar 1201



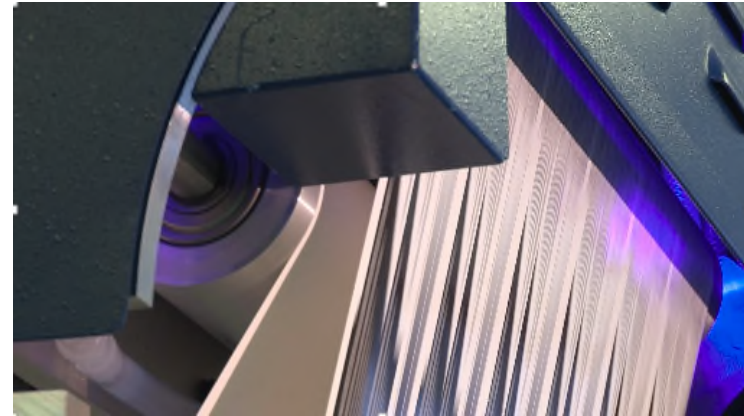
Xaar 5501



# Products

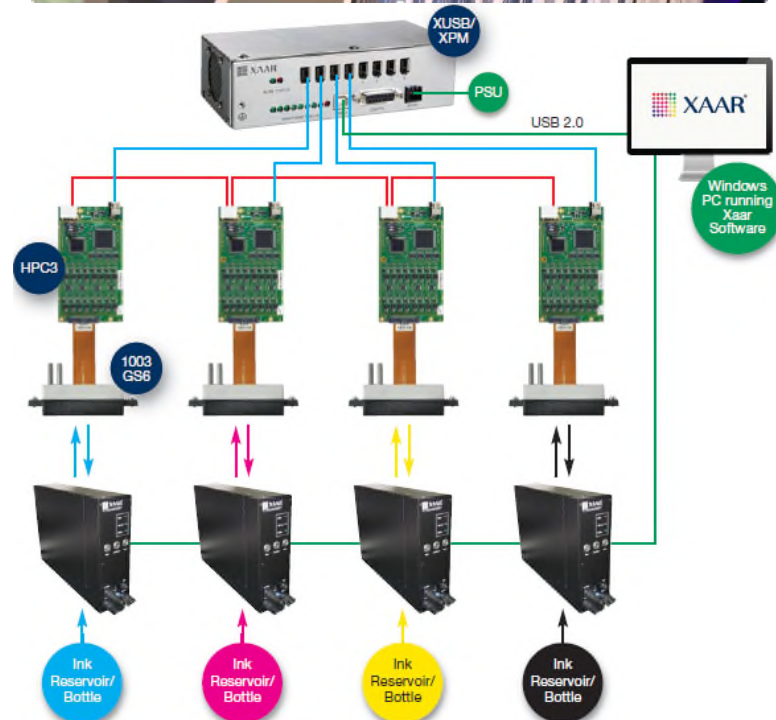
## ● Xaar Print Bar System

- Add single-pass digital mono inkjet UV capability
- Print speeds up to 75 m/min
- Spot varnish, cold foil effects, high opacity white, fine reverse text, flawless barcodes



## ● System Components

- Xaar Print Manager
- XUSB Drive Electronics
- Xaar Hydra Ink Supply System
- Xaar Midas Ink Supply System
- Xaar Head Personality Cards
- Inkjet Development System



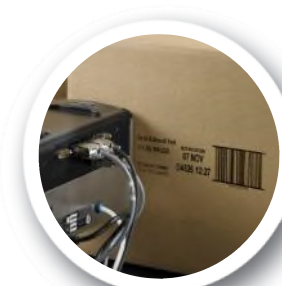
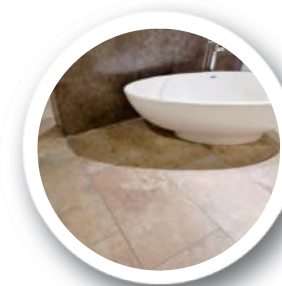
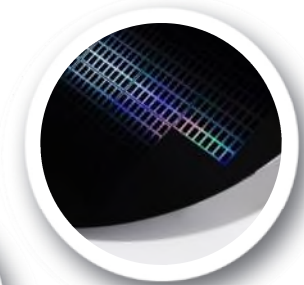
# Inks and fluids

- Xaar operates an open ink policy which allows customers to choose the ink supplier that best suits them and their application. We work in partnership with the leading ink manufacturers to develop and approve the widest range of compatible inks and fluids specifically matched to our printheads.
- All Xaar-approved inks go through the XaarDOT® fluid optimisation process, offering the additional benefits of a printhead warranty and the peace of mind that each ink has been optimised for performance and its application. This service consists of:
  - Determine the characteristics of a fluid
  - Materials compatibility and lifetime testing
  - Waveform optimisation
  - Reliability testing
  - Warranty



# Applications

- **Advanced Manufacturing**  
Photovoltaics, printed electronics, semiconductors, additive manufacturing (3D printing), flat panel displays, smart glass, biomedical
- **Ceramic tiles**  
Floor and wall tiles
- **Coding and Marking**  
Primary and secondary packaging, outer case bar-coding
- **Décor**  
Wood laminates, glass, wallpaper
- **Direct-to-shape**  
Cylindrical shapes or curved surfaces
- **Graphic Arts**  
Banners, POS material, soft signage
- **Labels**  
Decoration, identification and promotional labels
- **Packaging**  
Containers, bottles, folding cartons
- **Product Print**





# Xaar 128

The Xaar 128 has maintained its position as the leading 17mm piezoelectric drop on demand printhead of choice for the Coding and Marking (C&M) and Wide-Format Graphics (WFG) print sectors

- 20 year proven track record of reliability, ease of integration, throughput, speed and quality of print
- Compact footprint and weight of only 16 grams; ideal for applications where weight and size are a key factor in machine design
- The Xaar 128 is designed to be compatible with a range of oil, solvent and aqueous inks





# Xaar 501 GS8

The Xaar 501 delivers exceptional print quality, excellent reliability and high production up-time to the Wide-format Graphics market.

- Print in binary mode with a smallest drop size of 8 pL
- Or with 4 grey levels to increase productivity with high effective resolution
- Deliver industrial reliability and robustness
- The Xaar 501 is designed to be compatible with a range of oil and UV curable inks



# Xaar 502 GS15

The Xaar 502 delivers excellent reliability, high production up-time and exceptional print quality to the Coding & Marking market.

- Print in binary mode with a smallest drop size of 15 pL
- Or with 6 grey levels to increase productivity with high effective resolution
- Deliver industrial reliability and robustness
- The Xaar 502 is designed to be compatible with a range of oil and solvent inks



# Xaar 1003

Available in different drop size variants, the Xaar 1003 is the printhead of choice for a wide range of applications as it delivers unrivalled reliability for single-pass printing.

- Ceramics and UV variants
- 70mm swath
- 3 drop size ranges
- TF Technology®
- XaarGuard™
- Industrial reliability and robustness
- The Xaar 1003 is designed to be compatible with a range of oil, solvent and UV curable inks



# Xaar 1003 AMp

The Xaar 1003 AMp is perfect for very small drop fluid deposition on an industrial scale and is capable of consistently jetting droplets as small as 1 pL for the production of fine features, patterns and coatings.

Sectors such as:

- Display
- PCB
- Semiconductors
- Photovoltaics

The Xaar 1003 AMp is designed to be compatible with a range of oil, solvent and UV curable inks and fluids





# Xaar 2001 / Xaar 2001+

The new Xaar 2001+ is the most versatile family of high performance printheads available for ceramic tile decoration offering unrivalled production flexibility, market-leading print quality and industrial reliability.

- 2000 nozzles
- 1 colour at 720 dpi,  
or 2 colours at 360 dpi each
- 3 drop size ranges
- The Xaar 2001+ is designed to be compatible with a wide range of oil-based ceramic inks

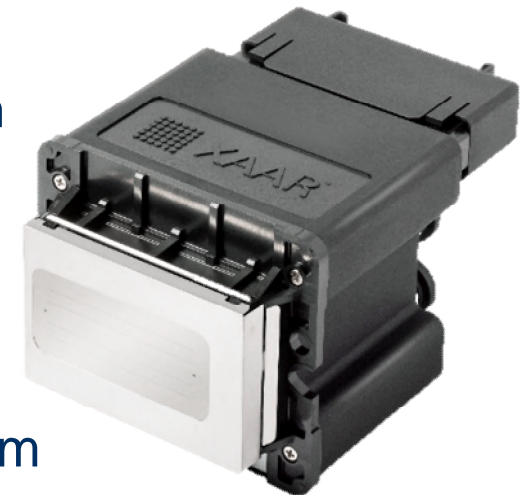




# Xaar 1201

The Xaar 1201 is a Thin Film Piezo Silicon Micro Electrical Mechanical System (MEMS) technology printhead perfect for OEMs looking to design graphics printers for banners, signage and POS applications.

- Capable of 1, 2 or 4 colours
- 4 colours at 300 dpi, or 2 colours at 600 dpi each
- Smallest drop 2.5 pL
- 8 greyscale levels
- Compact – just 53.7 x 45 x 75.6mm
- Physical and electrical connection is easy and robust; straightforward, low cost ink supply system
- The Xaar 1201 is designed to be compatible with a range of eco-solvent and aqueous inks



# Xaar 5601

The new and innovative Xaar 5601 family of printheads delivers a market-leading combination of total cost of ownership, print quality and usability.

Prelim specs:

Physical attributes	Xaar 5601
Active nozzles	5680
Print swathe width	116 mm
Number of rows	4
Colours	1 or 2
Nozzle pitch (interleaved)	21 $\mu$ m
Drop velocity	Up to 10 m/s
Nozzle density	1200 npi
Printhead weight (dry)	320 g
Ink type	Aqueous, Solvent, UV
Drop volume	3 to 21 pL
Number of grey levels	8
Typical firing frequency	100 kHz (binary)
Dimensions (DxWxH)	45x141x69 mm



# Xaar 5501

- This is a lightweight and high resolution 1200 dpi printhead which is ideal for a range of water-based digital printing applications, such as textiles (digital direct to garment, dye sublimation transfer and soft signage) and graphics (banners, posters, displays).
- It has 5544 nozzles, each producing 5 pL sub-drops giving an impressive 115 mm print width for high quality print at high productivity.
- The robust construction makes it compatible with a range of fluids including aqueous inks, low viscosity UV or solvent-based inks.



# EPS

Engineered Printing Solutions (EPS) is a leading provider of product printing equipment in North America. Xaar acquired EPS in July 2016.

- EPS has built a successful business through supplying customised and bespoke printing solutions to a wide variety of market sectors including promotional, packaging medical, automotive, apparel, appliances, sports equipment and toys
- One of its achievements has been to develop flexible and cost effective digital inkjet solutions. In 2015 EPS generated \$14 million of revenue and today employs around 60 people.





# Specialised product printing solutions

## EPS XD54

- High Speed Direct-to-shape inkjet printer for high throughput and best resolution
- Continuous multi-colour printing in a single pass with printing speeds up to 15 inches per second
- Optional custom automation for parts handling, in-line pre-treatment and vision systems.



## Custom Inkjet System

- The high volume inkjet printer can be customised to include in-line automation and part handling options
- Excellent for variable image data on short or long production runs with high resolution print quality using a single-pass variable dot size greyscale technology. Powered by Xaar printheads delivering high quality drop formation.







Thank you



XAAR<sup>®</sup>

Leading the inkjet revolution

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