



# INNOVATION

## Encouraging more sustainable approaches to design, manufacture, technology and collaboration across the whole Product Lifecycle

### Our progress

**84** people attended the "Seeing is Believing" open day

The Aquinox printhead is eco-friendly due to its water-based fluids, meaning fewer chemicals in waste water

Ultra High Viscosity technology has improved print quality at higher speeds with less ink and energy required

Our innovative products are enabling our customers to deliver a solution that has less impact on the environment



# Our innovation journey

## 2023 marks the start of a whole new chapter in our innovation journey

Since the launch of our Sustainability Roadmap in 2021, we have measured much of our Innovation pillar progress on Innovation from an internal operations perspective. As a result, we have made great strides by adopting more innovative approaches to sourcing materials – as well as our use of natural resources and energy.

This year is different. In 2023 we moved our 'North Star' to focus on the many ways that our technologies deliver transformational sustainability impacts to our customers and partners.



*We have moved the dial in terms of how novel ink formulations can be used to deliver real shifts in process efficiency.*

Led by our R&D Team, the result is that we have never been better positioned to measure and communicate our external impact on our value-chain.

## Our sustainable product philosophy

We're defining the next generation of print technology with a portfolio of products that is inherently more sustainable and designed to make a positive impact.

1

Performance is never compromised in the pursuit of sustainability.

2

Continuous improvement ensures we evolve our existing products to deliver sustainable outcomes.

3

Sustainability is inherent across our portfolio – quite simply, our products have a longer life-cycle than competitor alternatives.





# Evidencing our sustainable impact

Transparency and openness are values we share with our customers. They are also the principal drivers behind our decision to commission an independent research study into the end user benefits of jetting high viscosity water-based ink.

Led by Dr Chris Phillips and Professor Davide Deganello, senior academics from the Welsh Centre for Printing and Coating at Swansea University, this study provides third-party verification of our ability to deliver a wide range of impacts – including sustainability outcomes – to our customers.

## Independent evidence

Using the Xaar Aquinox printhead and cyan water-based inks from Nazdar (a world-leading manufacturer of inks and chemicals) the research team has provided third-party verification of the end user benefits to printing high viscosity fluids – a process which is enabled by Xaar’s Ultra High Viscosity Technology.



*“The Swansea University team’s research gives us solid, independent evidence of our ability to deliver sustainability outcomes for our customers and partners. This sends a powerful message to any business that is trying to minimise its environmental footprint – we welcome the opportunity to make that happen.”*



**Karl Forbes**  
Group R&D Director, Xaar Group





# Sustainability without compromise

The Swansea University team provided evidence of Xaar Aquinox's sustainability impacts: it enables customer to use less ink; meaning transport costs and process energy costs are also reduced.



## Less water = enhanced colour

The team found that a water-based ink with a much higher viscosity than typically possible delivered much higher colour density on the substrate. The lower amount of water in the higher viscosity inks meant less absorption into the substrate, delivering more vibrant colour, without the need for more pigment.



## Less ink = less energy

With less ink on the substrate, it seems obvious that less energy is needed for the drying stage. We are delighted to have this quantified and validated by the Swansea team. It sends a powerful message to any customers looking for new ways to cut carbon and reduce energy consumption.

## What's next...

The full results of Swansea University's research will be made available to our customers. This project will continue to investigate the process, functionality, cost and sustainability benefits, jetting high viscosity, high particle loaded fluids can deliver.





# 'Seeing is Believing'

We invited visitors to our Cambridge R&D facility to see first-hand how our latest technologies are redefining the boundaries of inkjet printing.

Under the theme of 'Seeing is Believing', the first ever Xaar Open Day was designed to help customers and partners understand what is now possible using fluids with higher viscosities and higher particle loading, all enabled by Xaar's Ultra High Viscosity Technology.

The day included talks and live print demonstrations showcasing how Xaar's inkjet is unlocking opportunities in new, and existing, sectors and applications. The day was also an opportunity to explain the environmental sustainability impacts of our Ultra High Viscosity Technology, including a presentation from the Welsh Centre for Printing and Coating at Swansea University.

Ultra High Viscosity  
TECHNOLOGY



FuturePrintTV captured much of the day on video including interviews with many of our guests.

[Click to view the video.](#)



# Aquinox: A 'game-changer' print technology with sustainability impacts

**Powered by our ImagineX platform, the Xaar Aquinox is an exemplar of our commitment to designing innovative technologies that deliver sustainable outcomes – without compromise to performance.**

The Aquinox unlocks inkjet opportunities for the use of aqueous inks. It enables printers to fully embrace water-based digital inkjet printing, through the reliable, creative, and sustainable jetting of both dye-based and pigmented aqueous fluids, all driven by our new aQ Power Technology.

## **60% energy & water savings**

Reduced energy consumption and water usage (both in production and drying times), and especially in textile printing, can equate to as much as a 60 per cent saving in energy and water over similar analogue printing processes. And with Xaar's Ultra High Viscosity Technology, these savings are increased even further.

## **Reduced ink wastage**

Xaar's TF Technology ink recirculation gives improved open time and latency, reducing maintenance and unnecessarily wasted ink, saving energy and resources.

## **Long service-life**

The Aquinox is designed to be inherently robust. Our careful choice of materials and the development of aQ Power Technology means we have extended the product's lifespan. For our customers, this helps to minimise waste and lowers total cost of ownership as well as the environmental impact.





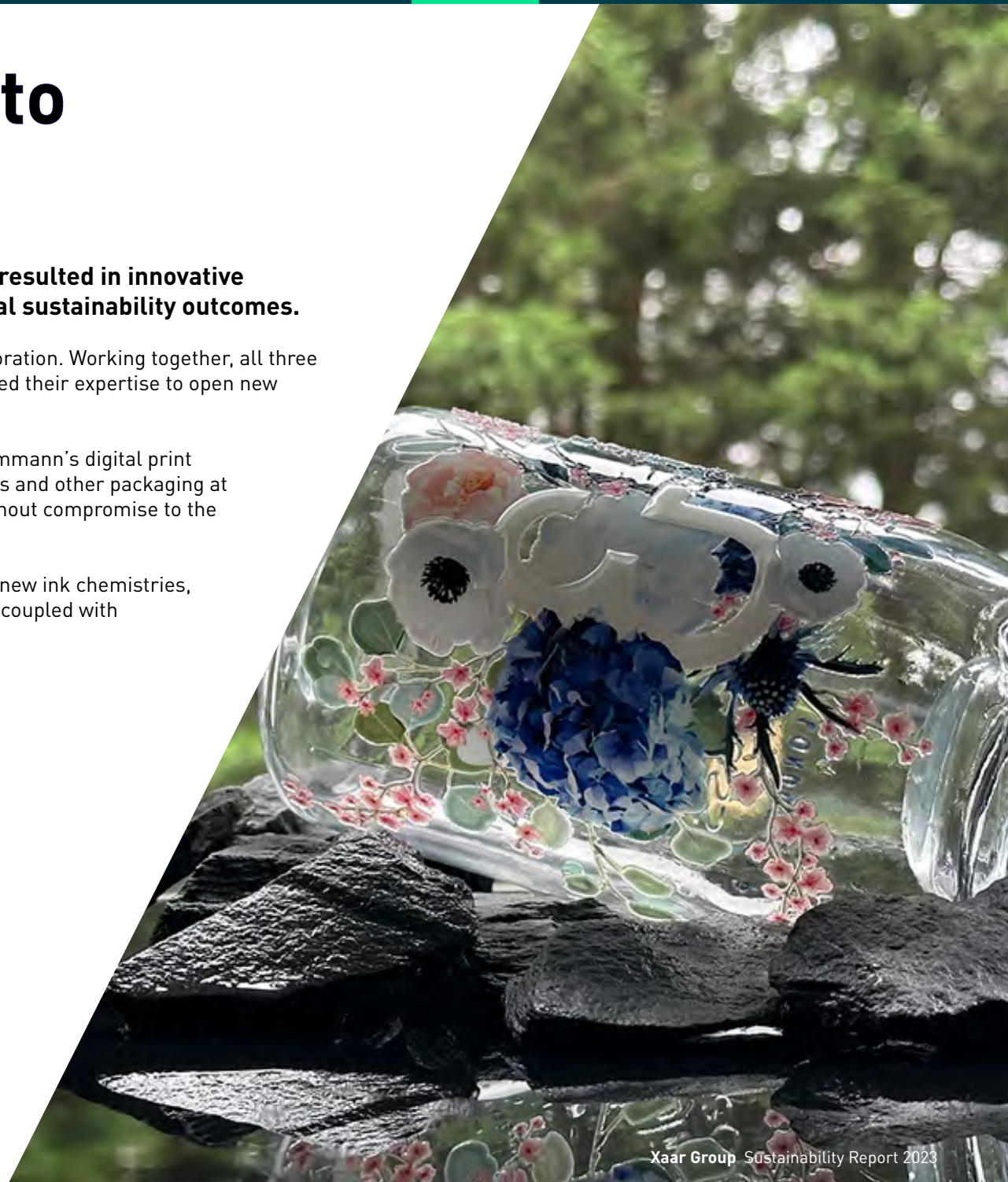
# Collaboration leads to transformation

**A collaboration between Xaar and two other businesses has resulted in innovative approaches for decorative printing – alongside environmental sustainability outcomes.**

This project is the perfect example of our approach to supply-chain collaboration. Working together, all three partners – printhead manufacturer, ink supplier and machine builder – used their expertise to open new possibilities that traditional analogue printing methods cannot deliver.

By combining Xaar’s printheads, Marabu’s Ultra High Viscosity ink and Kammann’s digital print innovation, it has been possible to create embossed effects on glass bottles and other packaging at a laydown build height up of to 3mm. Crucially, all of this was achieved without compromise to the intricate details of the embossing and sharp contour edges.

We have no doubt that this project is just the start, and the combination of new ink chemistries, machine know-how and our printheads will deliver fundamental change – coupled with sustainability benefits – to many industries over the next few years.



KOENIG & BAUER



# Customer impacts: Reducing CO<sup>2</sup> emissions for vehicle manufacturers

## Challenge

Currently around 40 percent of paint is lost when spray painting a car, not only wasting valuable materials but also significant amounts of energy. The possibility of inkjet printing offers vehicle manufacturers significant potential savings in terms of paint use, waste levels and lost time.

## Industry need

The reliability of Xaar technology, alongside our ability to jet very high viscosity fluids, enables digitisation of the car painting industry. Unsurprisingly, this has stimulated significant interest from car manufacturers not only for reducing these costs and waste but also for the manufacturing flexibility that a digital inkjet solution offers.

## Solution

We have been working with leading global coatings company, Axalta, to develop Axalta NextJet™, a next generation, sustainable digital paint technology for the transportation industry.

## Result

In August 2023, we announced our partnership with the launch of Axalta NextJet™. This innovative technology enables design flexibility for two-tone vehicles and allows customers to create patterns, details, and images in a sustainable way. It also eliminates masking and reduces labour – thereby increasing productivity and efficiency rates.



30%

Axalta has already reported that this can contribute to an astonishing reduction in CO<sup>2</sup> emissions and significant cost savings for two-tone vehicle manufacturers.

