



Inkjet Explainer

What is custom (bespoke) inkjet? Why should you care?

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Our explainers for today



Get the most from
your time with us!

**SEND US YOUR QUESTIONS
DURING THE WEBINAR**

- **Question control is in the lower left corner**
- We may answer during the presentation
- There is a Q&A at the end
- Video and audio archive will be uploaded later today along with PDF of slides

#inkjetexplainer

What is it? Inkjet integration in all its forms

1

Customized

- Configurable
Entry level / tabletop
- Less common:
tweaking inkjet presses

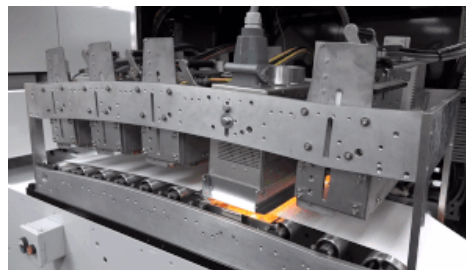


Source: Astronova

2

Hybrid

- Multi-process solutions
 - Inkjet + offset
 - Inkjet + flexo
- Commercial
- Labels & packaging



Colordyne 3600 Retrofit System for flexo

3

Bespoke

- Packaging integrating into manufacturing
- Industrial - where the magic happens!

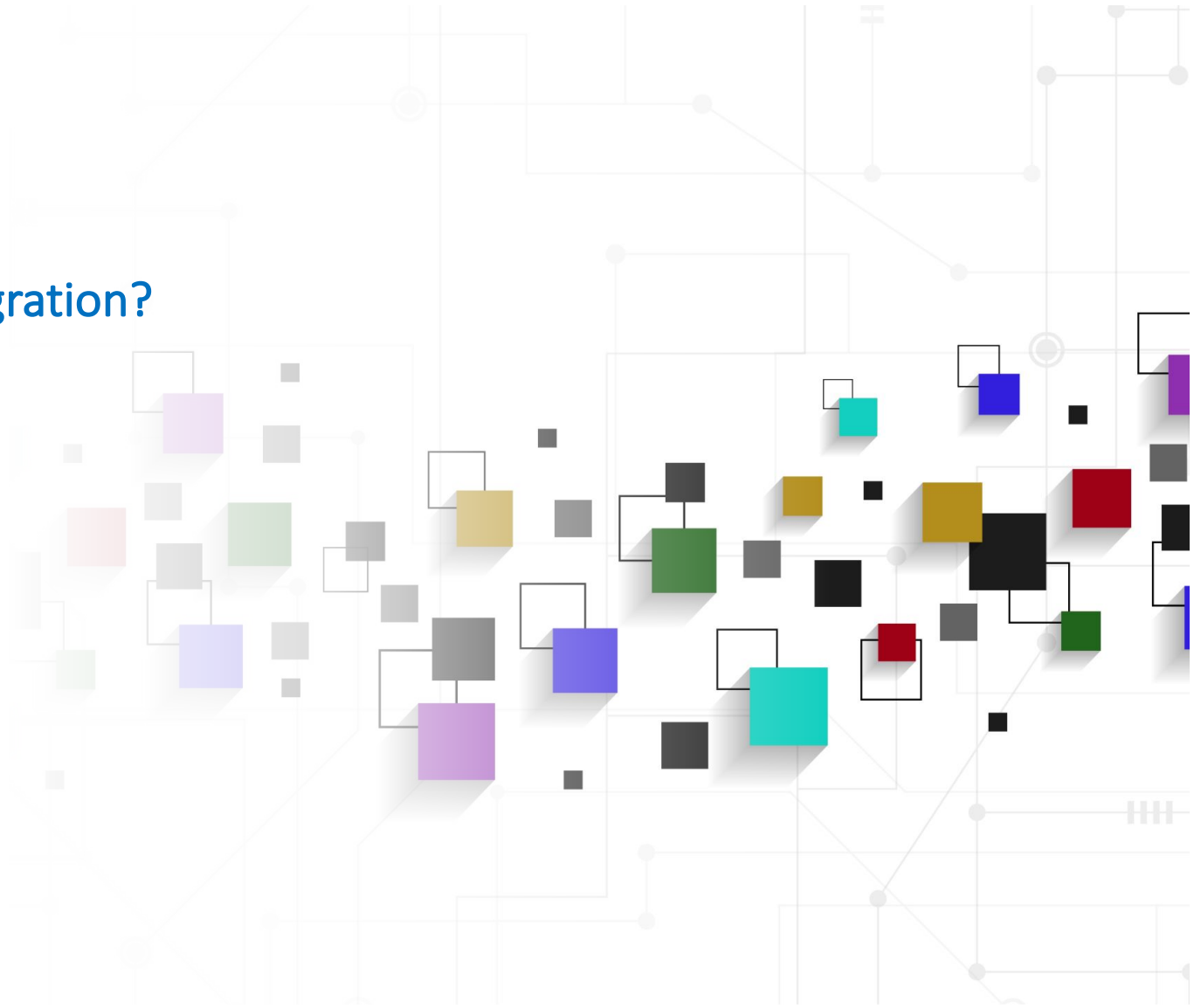


Neos Bombardier

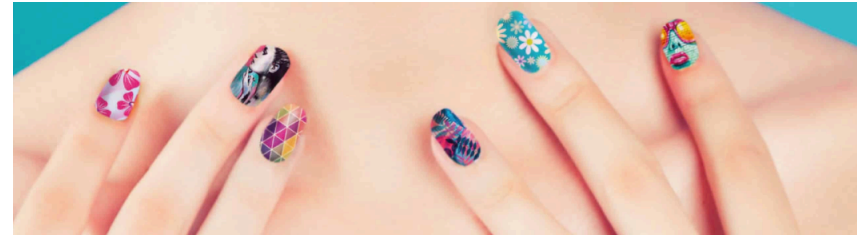


Why consider inkjet integration?

- Extend life
- Solve new problems
- Cost/quality
- Risk management
- True “Voice of Customer”
- Develop new partnerships



Who gets into this



Custom inkjet fingernail art printing <https://fingernails2go.com/>

- Established Inkjet OEMs
 - Emerging OEMs
 - Inkjet component providers
 - Finishing companies
 - Large manufacturers
 - Large printing companies
 - Market testers of all sizes
- BHS, Inca, Shumacher
 - Kodak & Uteco
 - Koenig & Bauer Durst
 - HP SPTS Astronova
 - Hunkeler (Canon) & Amazon (finishing)
 - And many more large and small

What expertise is needed?

- Application expertise
- Supply chain
- Understanding of hardware components and how they combine
- Ink and fluid chemistry
- Software / RIP / Firmware
- Transports
- Testing processes & equipment
- Consider customer expertise



Who are the players?



Integrators & Bespoke OEM

- Bergstein (NL)
- Cadis (DE)
- Colordyne (US)
- DJM (NL)
- EPS (US) part of Xaar
- Fujifilm IIS
- Industrial InkJet (UK,US)
- Inkatronic (AT)
- Integrity (US)
- Neolt (IT)
- PPSI (US)
- QRES (CZ)
- Simply Inkjet
- **Many, many more worldwide**

Independent contributors of technical know-how

- DoDxAct Ltd
- Schilling Inkjet Consulting

- TriJet (UK, Rheology)
- Summit Analytical (US, Formulation)
- DD&T (UK, Bespoke Engineering)

Non-industrial integration and retrofitting



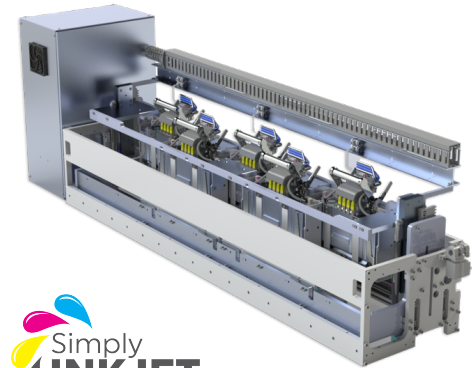
Integrated Inkjet Solutions Samba JPC

- Printbar and components
- Image optimization software & Inline scanner
- Head cleaner & web cleaner

FUJIFILM

Colordyne
Fujifilm
HP
Kodak
Konica Minolta
Memjet
Ricoh
Xaar (FFEI)

SIGRA 1000



New Release: Memjet Durabolt Engine & PrintBar



DuraBolt 325C CMYK Print Engine
ModBus solution architecture
'ThunderBolt' printheads
Custom Digital Front End
DuraBolt Ink (aqueous pigment)
Aerosol extraction system
Memjet Cloud Services 2.0

DuraBolt PrintBar (monochrome)

1,600

DPI

240

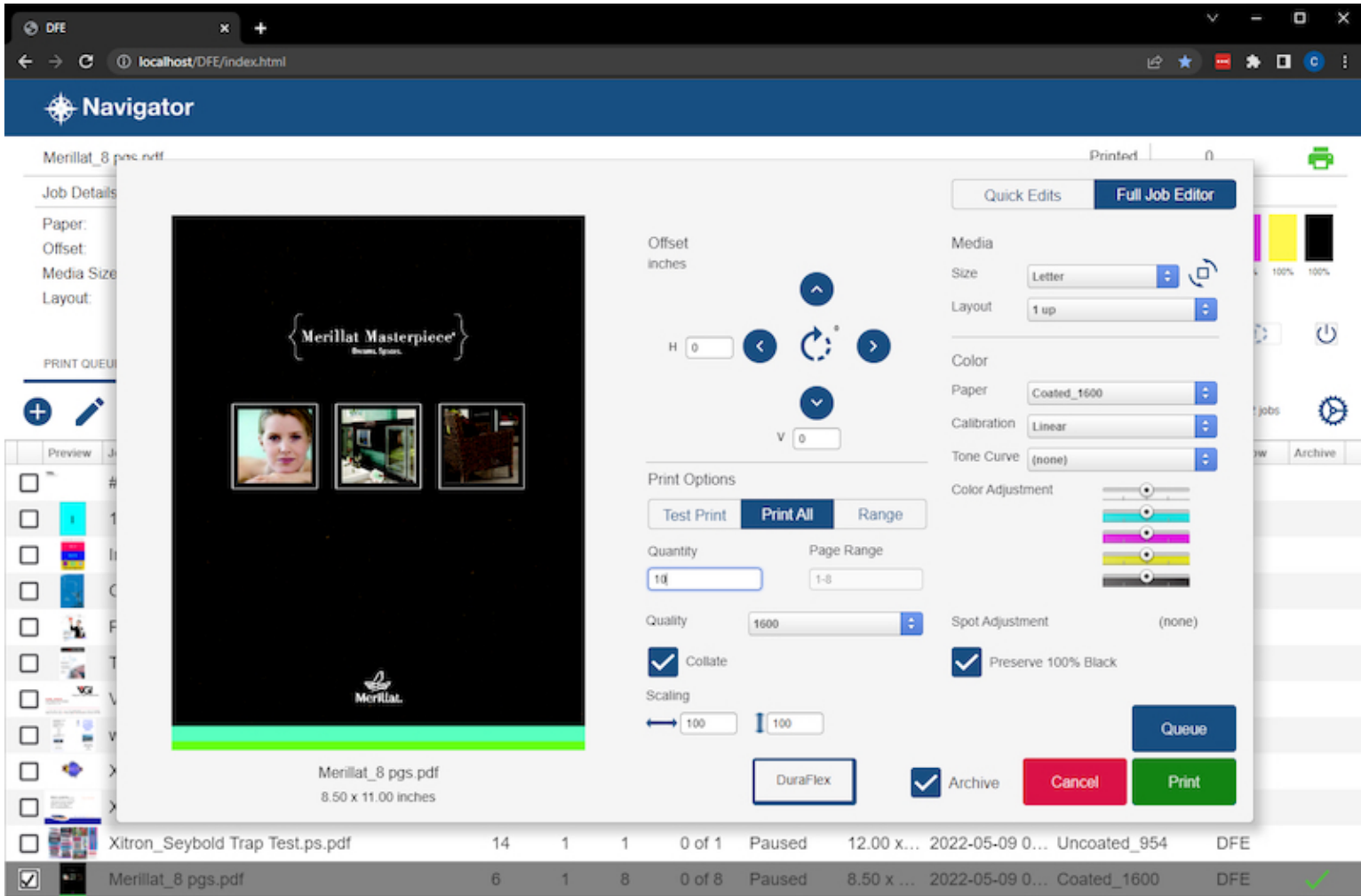
Liters / Printhead

4x

Nozzle Redundancy

450

Feet / Min Speed

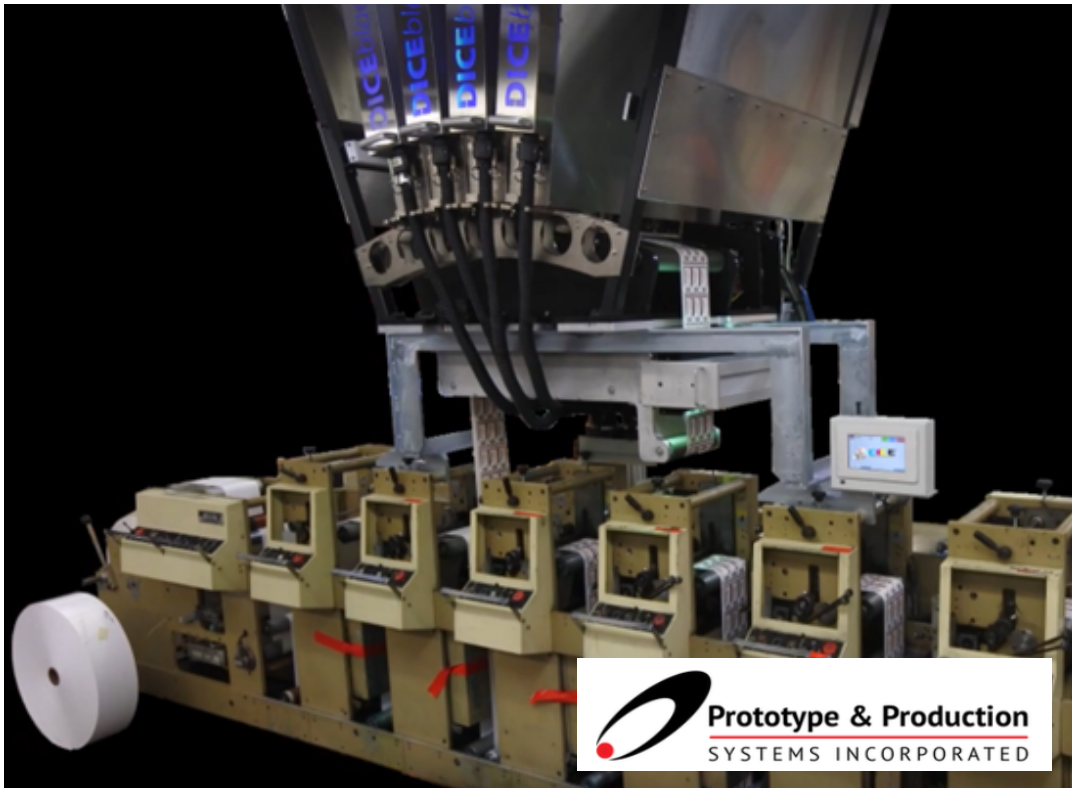


**Custom DFE is
new strategy
for Memjet /
Durabolt.**

Custom Navigator
DFE, based on a
Harlequin RIP.

Retrofit Examples

- Engineered to create required space

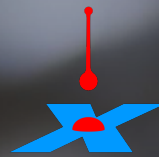




for Industrial Inkjet Presses

- **Increase production:** the world's fastest variable data RIP; supports Industry 4.0 using OPC UA
- **Reduce costs:** predict maintenance, automate tasks, and optimize print settings
- **Future-proof your solution:** easily adapt to new technologies and requirements
- **Add your own value:** customize the software to meet your specific needs

For more information visit www.globalgraphics.com/smardfe



Bespoke Inkjet – What is it?

✓ Can be characterised as:

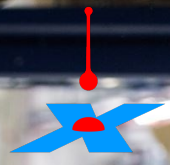
- Usually targeted for industrial markets
- Application-focused printhead configurations, e.g.
 - Custom width printbars
 - Specific colors/chemistry
- Specific Part Handling
 - Engineered to combine with existing or new transports



✗ What it is not!

- The same box made & sold 100+ times





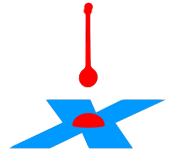
Why Bespoke Inkjet?

To meet a specific part manufacturing/decoration need based on form factor

Customization Adds Value

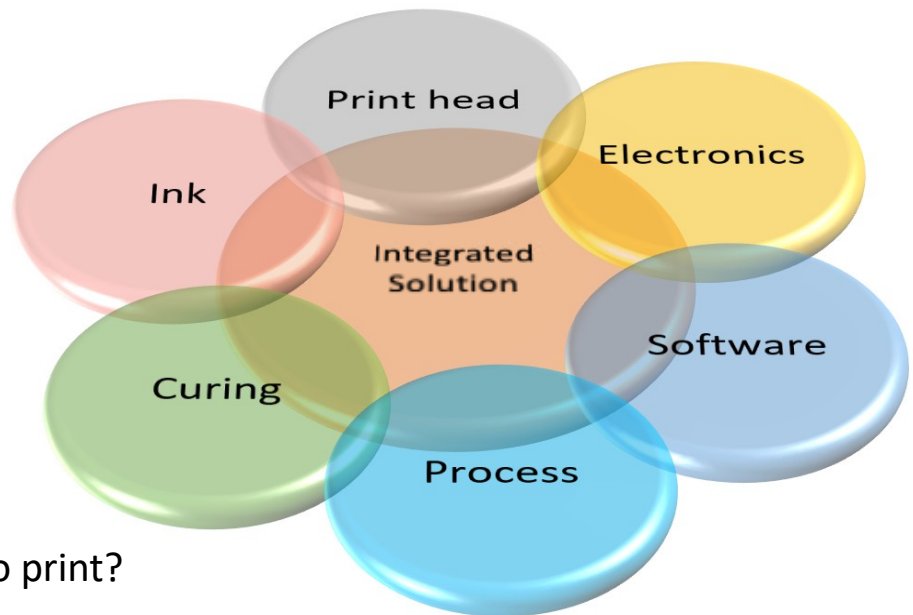
- The print industry is very price sensitive.
 - A new printing approach has to be cheaper or remove cost in supply chain
 - Or allow for higher pricing
- Retrofit inkjet *can* do this
- But bespoke inkjet *can go one better*
 - It can *literally* make possible what simply wasn't before





Refresher – Elements of an Inkjet system

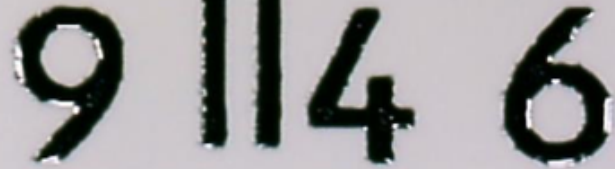
- Key challenges
- Here's a reminder:
 - Substrate
 - Ink Chemistry
 - Ink Delivery System
 - including printhead in this !!
 - Motion systems
 - **Software**
 - where would we be without the data to print?



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Plastics

- Labels
- Packaging
- Consumer goods



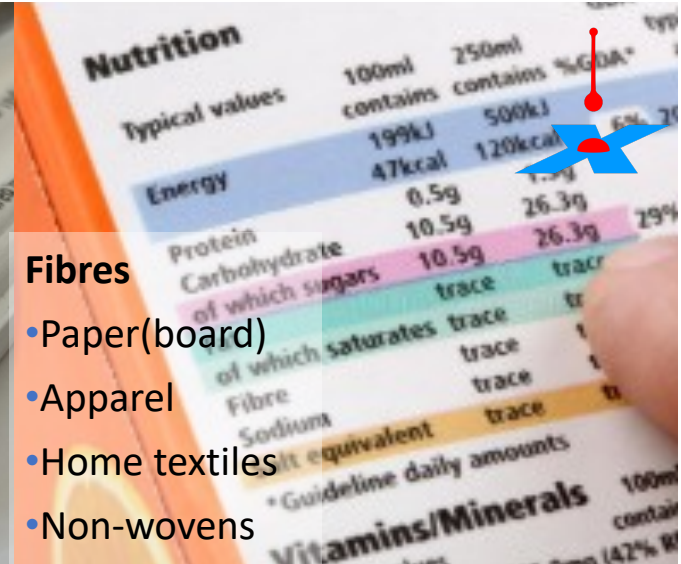
Wood

- Décor
- Shipping materials



Fibres

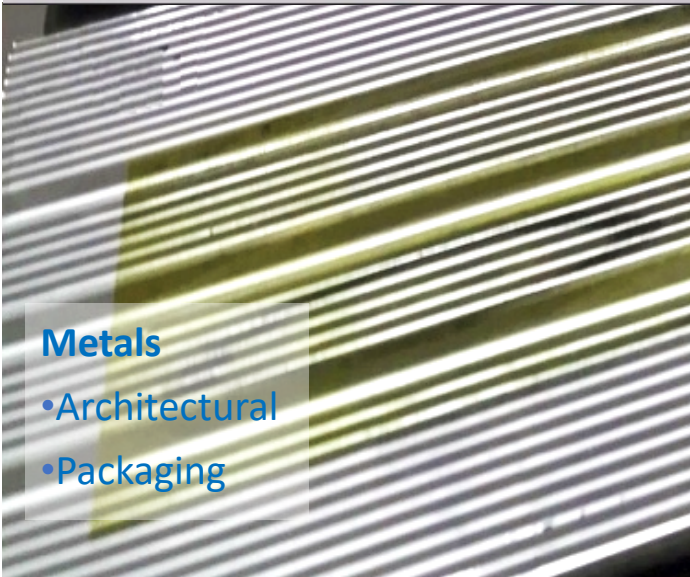
- Paper(board)
- Apparel
- Home textiles
- Non-wovens



Substrates

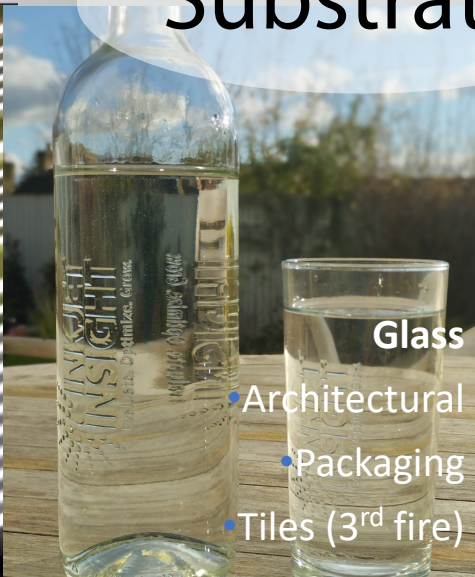
Metals

- Architectural
- Packaging



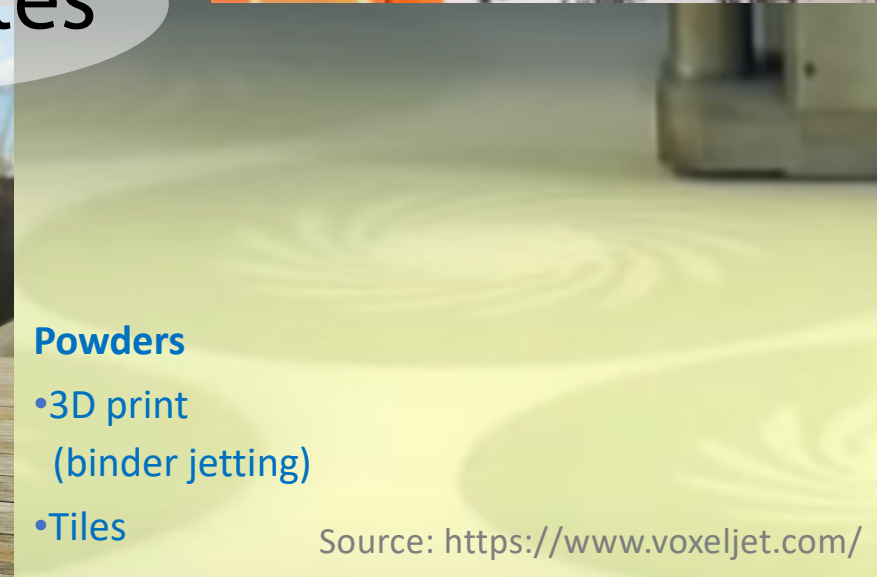
Glass

- Architectural
- Packaging
- Tiles (3rd fire)



Powders

- 3D print (binder jetting)
- Tiles



Source: <https://www.voxeljet.com/>

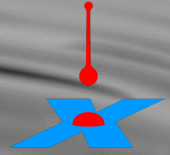
UV

- Graphics
- Labels
- Packaging
- Direct-to-Shape
- "Versatility"

Image: EFI.com

Water-Based

- Paper
- Graphics
- Packaging
- "Sustainability"



Inks

Solvent

- Coding & marking
- Functional materials



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Oil

- Ceramic Tiles
- Paper Packaging



Evaluate. Optimize. Grow.

Hot-Melt

- Sanitaryware
- Food (e.g. M&Ms)
- Niche Industrial



Image: Deacro



Roll-to-Roll

- Ultimate speed
- Controlled gap

Linear & Other Stages

- Ultimate Precision
- Limited throughput



Image: Aerotech

The Mechanics

Belts / Conveyors

- Industrial workhorse
- Important to specify appropriately



Custom Motion/ Robotics

- Arbitrary shapes
- Specific Process Flows (print to shape)

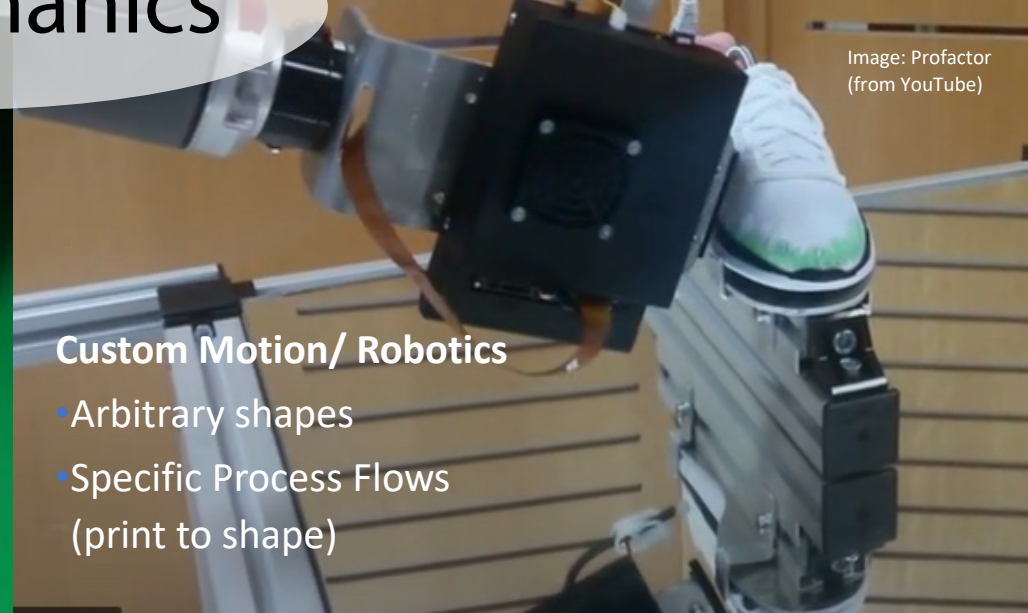
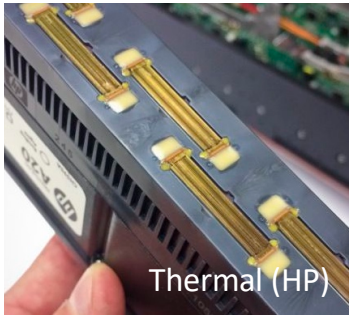
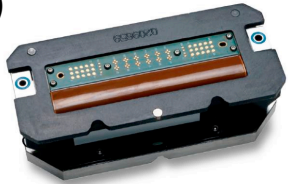


Image: Profactor (from YouTube)



Thermal (HP)

CIJ (Kodak)



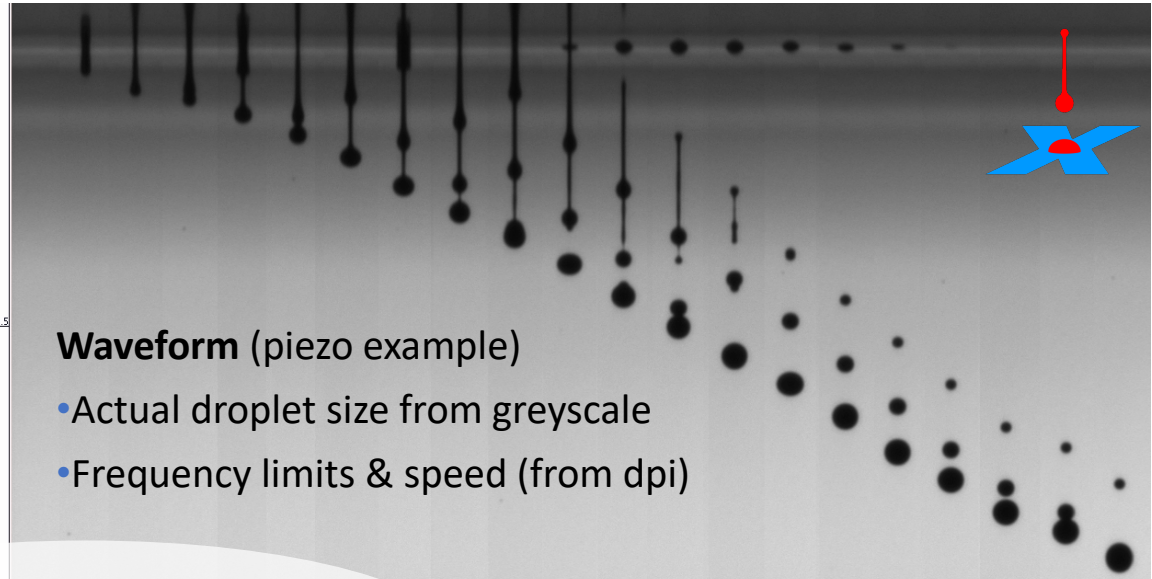
Heads

- Droplet native size
- Addressability



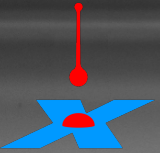
Piezo (Ricoh)

Valvejet (ITW)



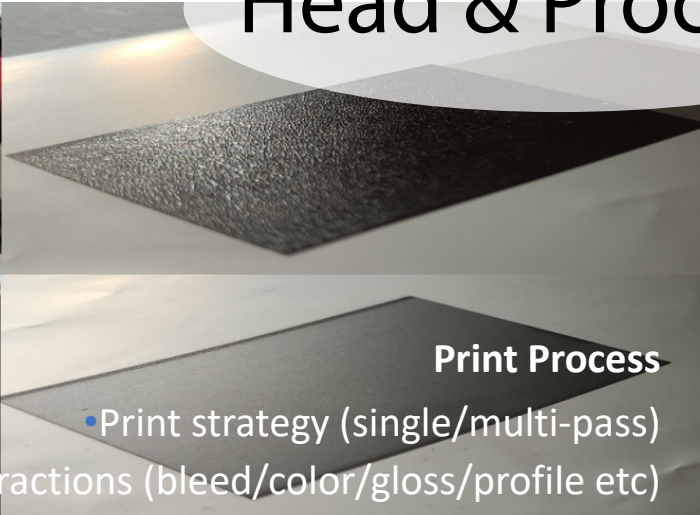
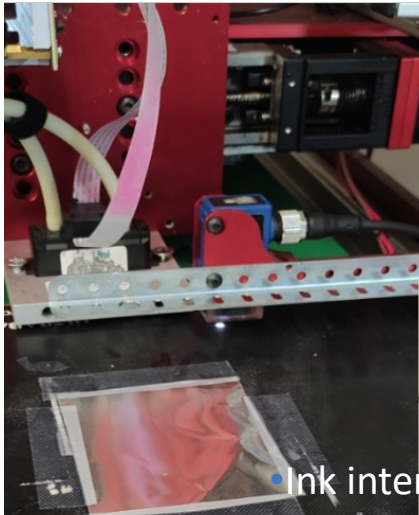
Waveform (piezo example)

- Actual droplet size from greyscale
- Frequency limits & speed (from dpi)



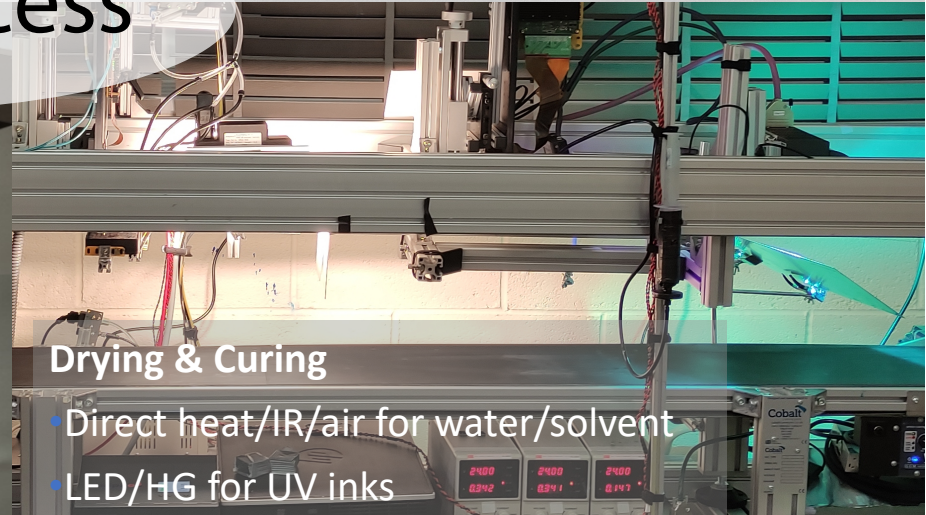
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Head & Process



Print Process

- Print strategy (single/multi-pass)
- Ink interactions (bleed/color/gloss/profile etc)

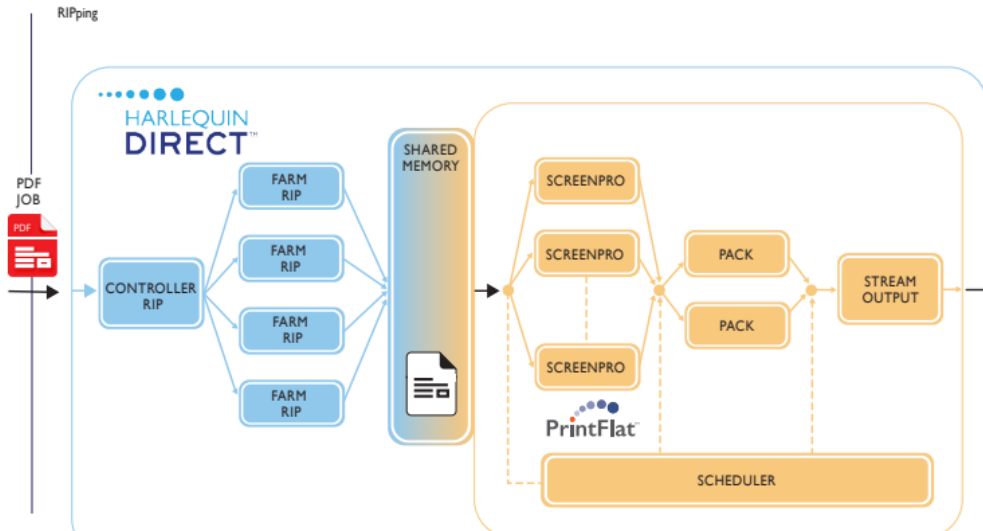
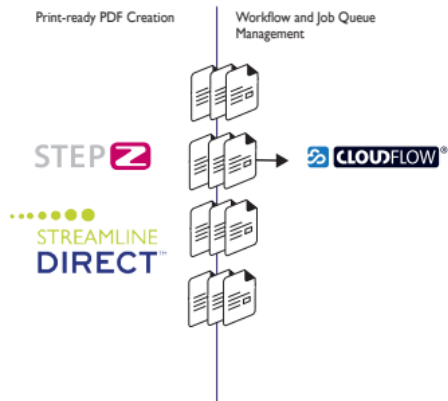


Drying & Curing

- Direct heat/IR/air for water/solvent
- LED/HG for UV inks

Workflow

- Receiving and controlling jobs



GUI & RIP

- Ease of use (operator)
- Flexibility (service)

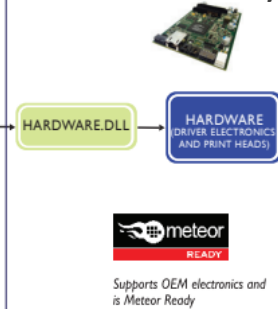


Image: Global Graphics

Software & Hardware

RIP

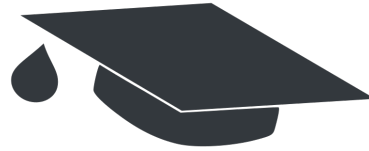
- Image quality (screening)
- Color management

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Print Hardware & Firmware

- Overall system control (PLC)
- Distributing data to printheads

Image: Meteor



Inkjet Academy




Eager to Learn More
[Fundamentals?](#)
Visit InkjetInsight.com

May 16 - 17 in Florida at the IMI Inkjet Conference
Visit https://dodxact.com/inkjet_academy/
Co-presenters: Mark Bale, DoDxAct & Terry Clayton, Summit Analytical



Bespoke Inkjet Examples



 **BERGSTEIN** – Gloves / Objects

 **NEOS** – Packaging, Decor

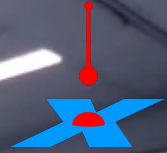
 **APRECIA** – Oral Pharmaceuticals

 **QRES** – Architectural materials

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Single Pass Printers



- Inkjet Platform Technology
 - Own ink system design
 - Customised print software
 - Modular approach to scaling size

Source: <https://www.bergstein.com/>

Case Study: Spring Fill Gloves

- Innovation development during lockdown
- Challenging ink application
- Very specific part handling





Custom Handling

- Challenge #2 = Engineering

- Part holding jigs are customised to the specific geometry
- Multiple carriers per machine ensure the high productivity of the single-pass inkjet is not wasted



Ultrawide Modules



- Sizes exceeding 2m (80")
- Roll-to-roll (flexibles) or belt feed (rigid boards)
- Modular design critical to affordable adaptation, e.g. printhead selection



Applications



- Belt-handling for Rigid packaging / Décor
- Varied in types from UV to Water-based

The logo features a stylized orange 'Z' with a dotted pattern to its left, followed by the words 'FORM' and 'FLEX' in a grey box.The logo consists of the word 'APRECIA' in blue with an orange arc above it, and 'THE 3DP PHARMACEUTICAL COMPANY ©' in smaller text below.

Pharmaceuticals

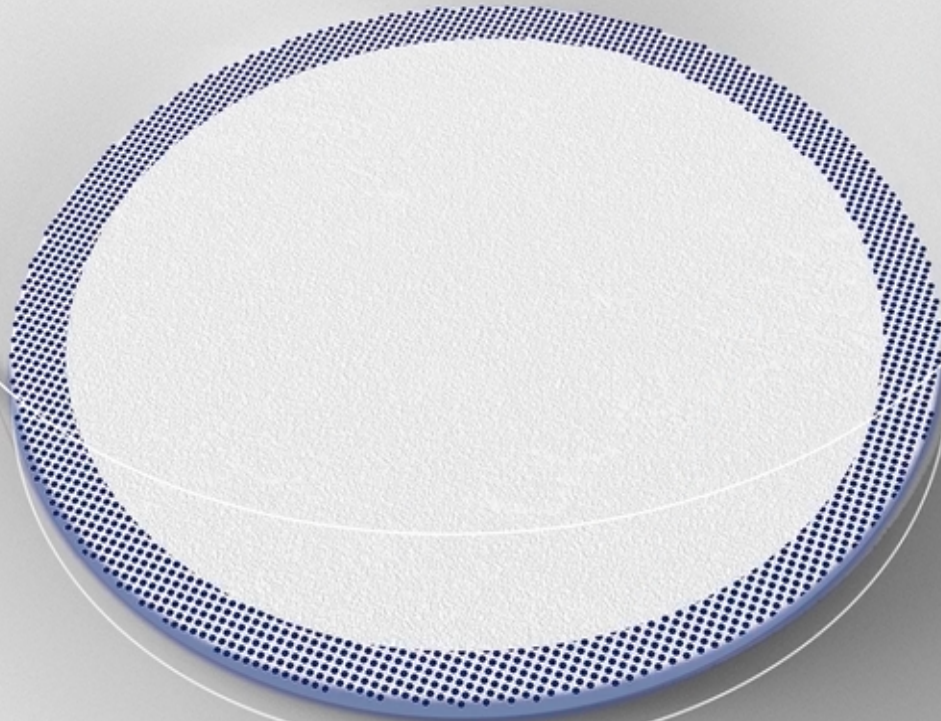


- Derived from binder-jetting 3D printing technology
- Original conveyORIZED platform developed with Integrity Integration
- Dissolvable Powder combined with deposited binder

Source: aprecia.com

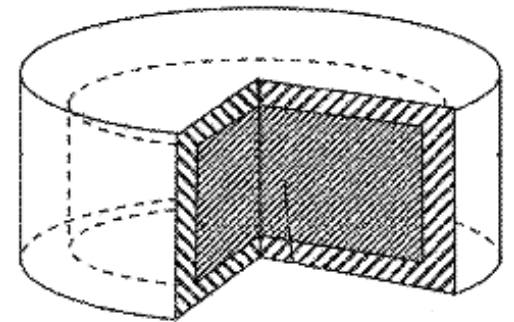
Evaluate. Optimize. Grow.

Why use inkjet at all?



Source: aprecia.com

A ring pattern is printed on the first layer to establish the boundary wall



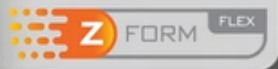
Source: US11433022B2

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The New Standard of Formulation Freedom & Manufacturing Agility

Custom Handling

- Allows for structures not possible by pressing
- E.g. Z-Fill technology
- Can use actives that cannot be printed into directly

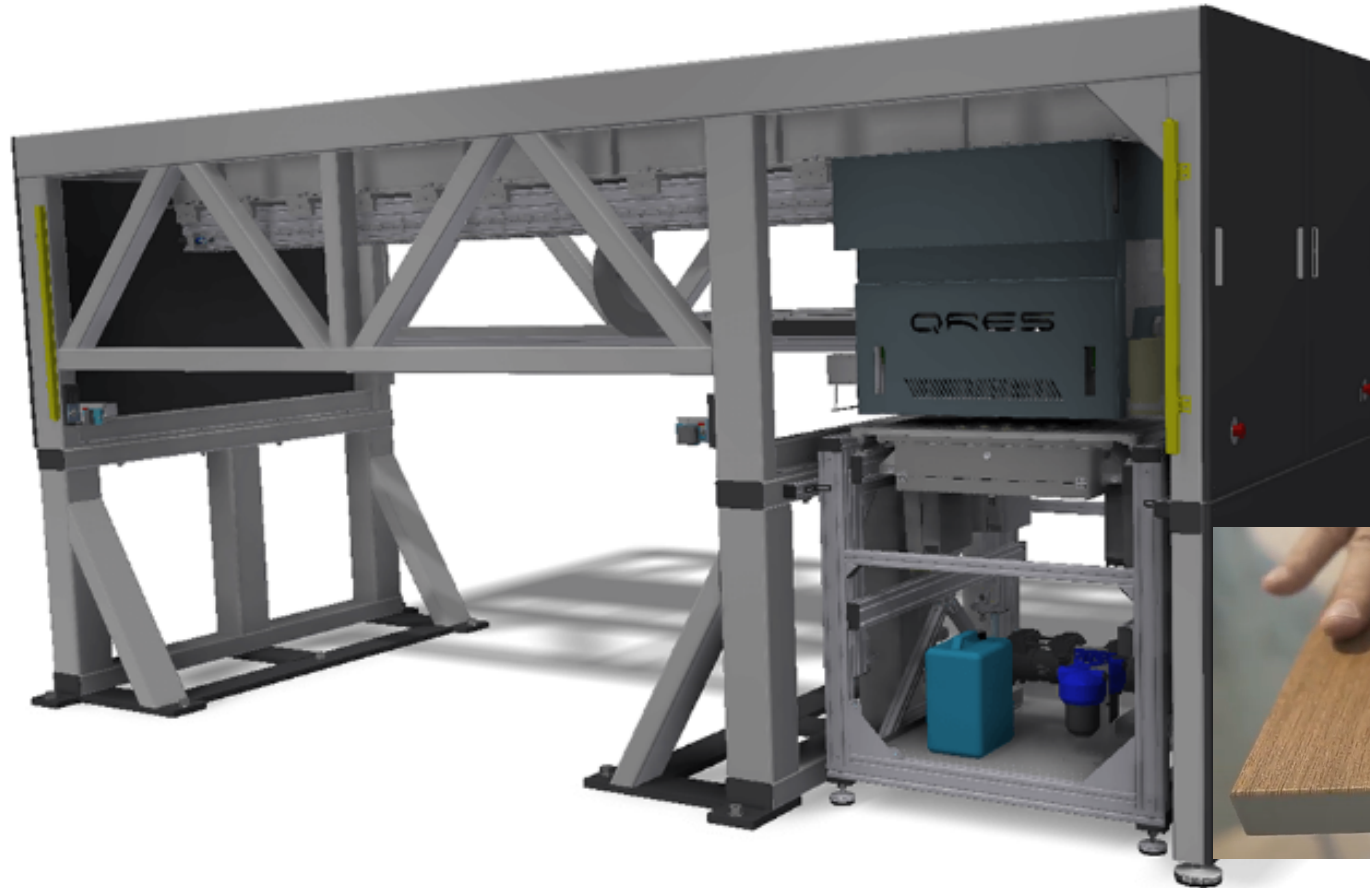


Source: aprecia.com





Custom Multi-Pass



Wide format-style
Engineered for
substrate flexibility



Questions?



Evaluate. Optimize. Grow.
Repeat



Need something explained?
Let us know.

For more information please contact:

Elizabeth Gooding
elizabeth@inkjetinsight.com

Thank you for your time and attention.

We look forward to the opportunity to help you reach new customers through valuable technical and educational content and to grow your business through market analysis and expert guidance.