



# Inkjet Explainer Series

## Inkjet Head Technology Explained

February 23, 2021

**Evaluate. Optimize. Grow.**

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**#inkjetexplainer**



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## 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**

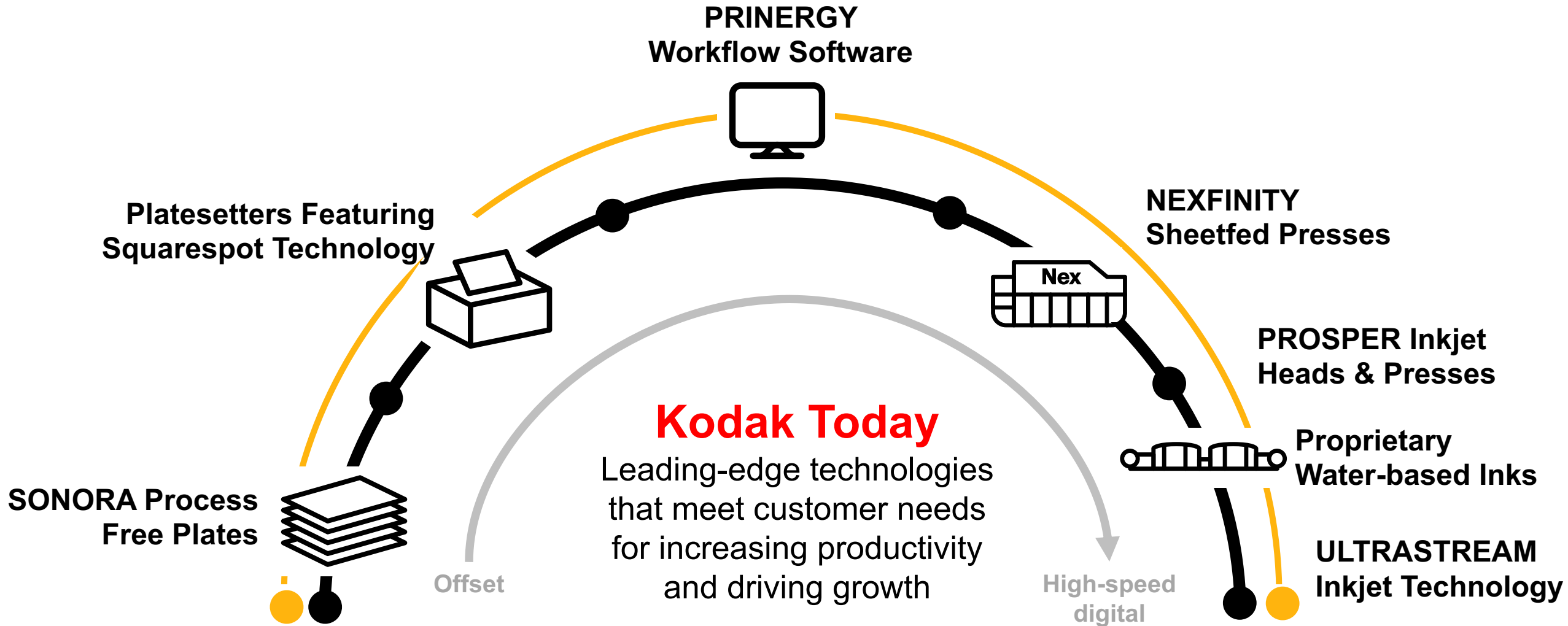


## **Our Explainers**

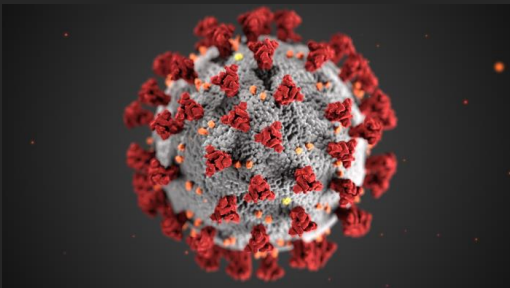
Mary Schilling, Inkjet Insight

Mark Bale, DoDxAct, Ltd

# A FULL RANGE OF SUPERIOR SOLUTIONS



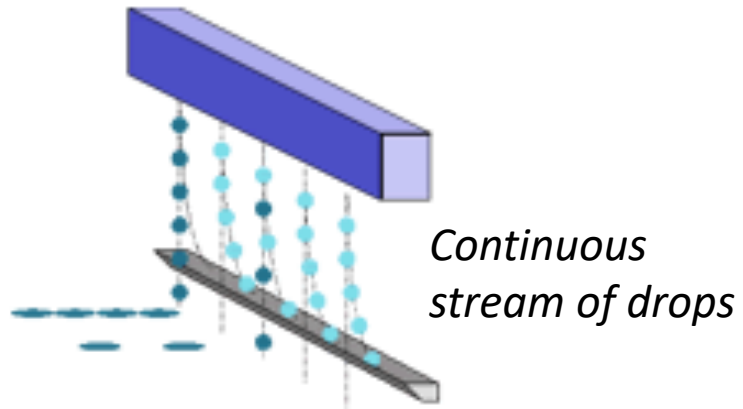
**Fun Fact:** The pigment particles in many CMYK inks are roughly similar sizes to the SARS-CoV-2 virus (60-140nm)



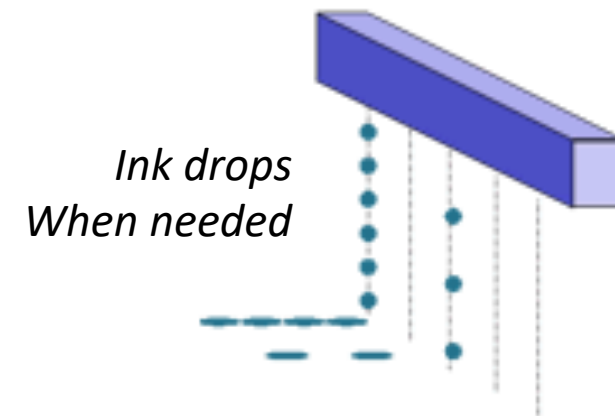
# Print Head -Types

## Inkjet Printing

Continuous  
(CIJ)



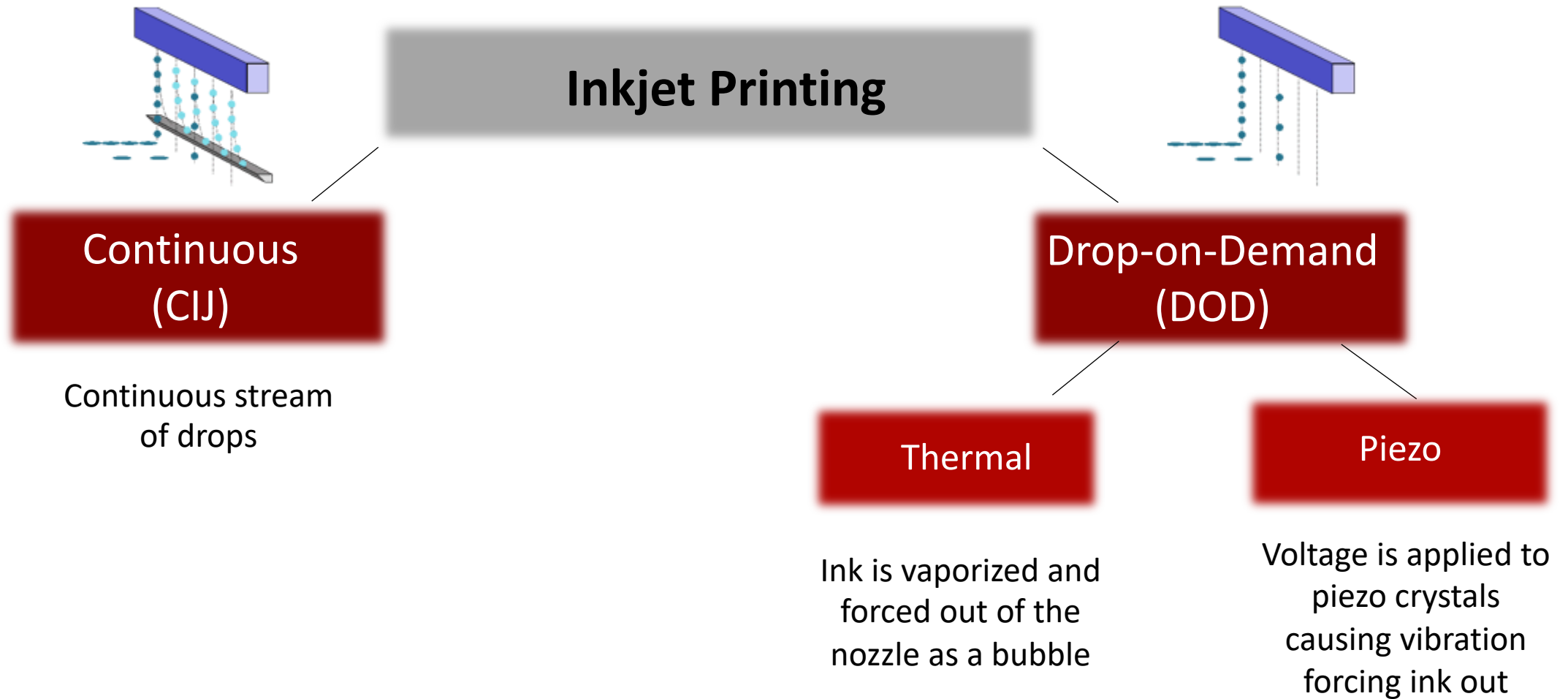
Drop-on-Demand  
(DOD)



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# Print Heads –How They Jet



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# Print Heads –How They Jet

## Continuous (CIJ)

Nozzle

Deflection Path

Ejection Path

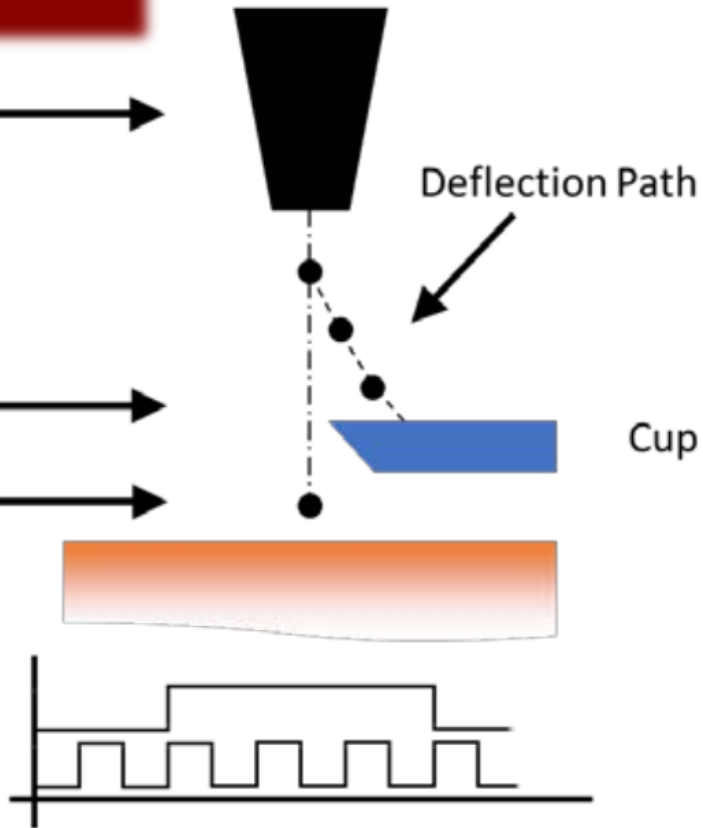
Droplet

Substrate

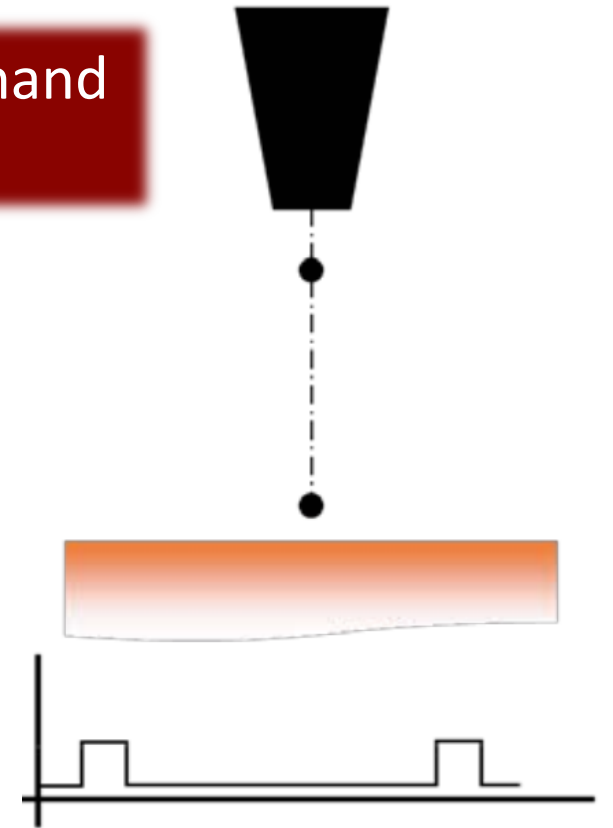
Cup

Drop Deflection Signal

Drop Ejection Signal



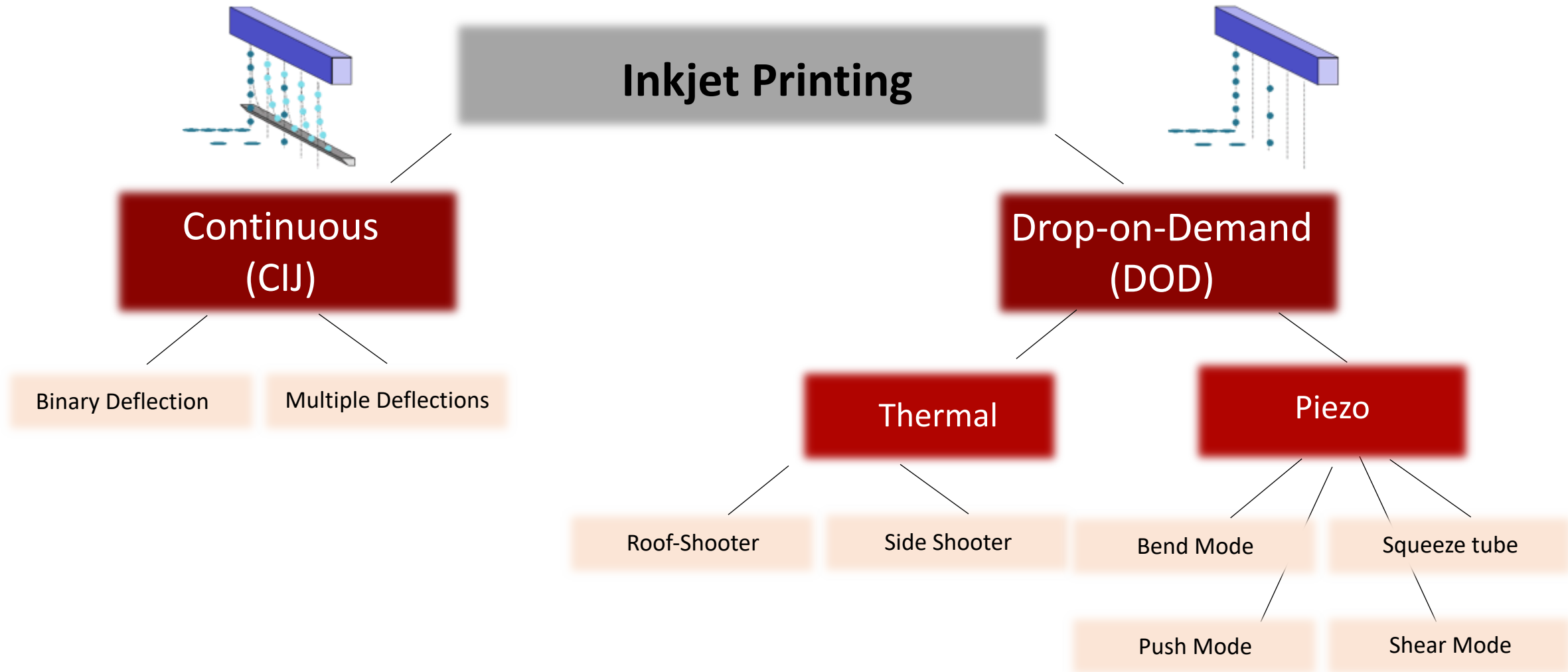
## Drop-on-Demand (DOD)



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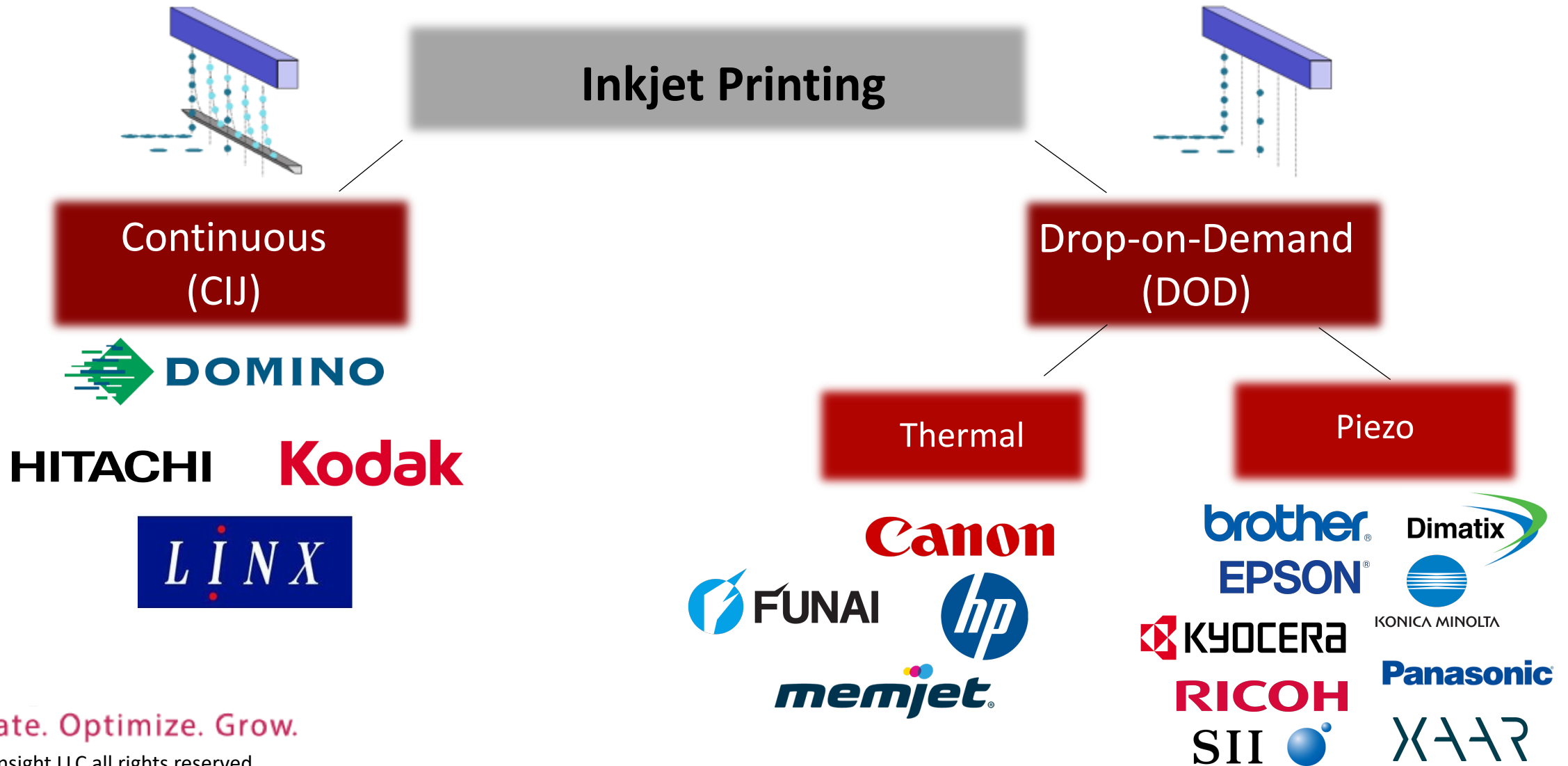
# Print Heads – Jetting Modes



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# Print Heads – Market Players



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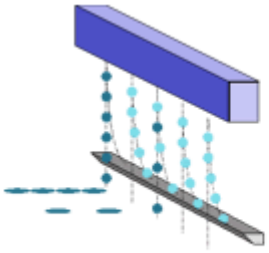
Print Heads are the heart of any inkjet print system.

*Fun Fact: The size of print head nozzles are typically 20-50 micron; the average human hair is approximately 80 microns...*



# Print Heads –Continuous (CIJ)

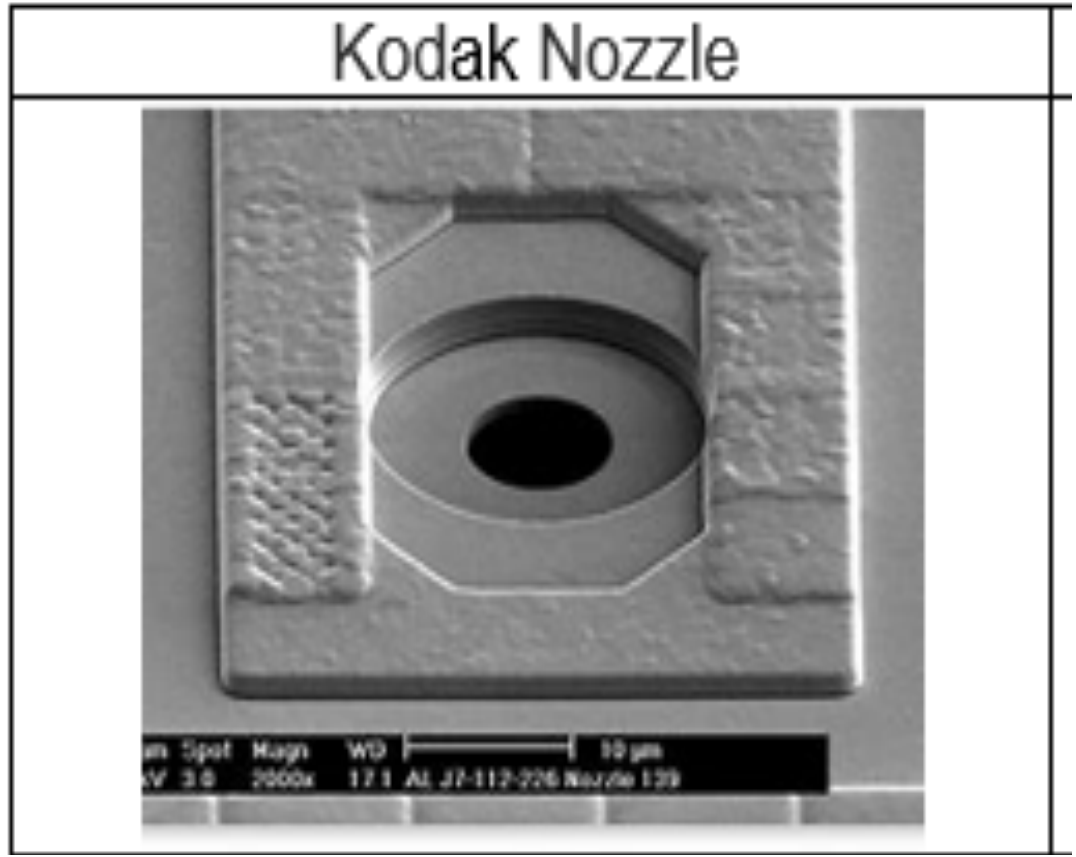
Continuous  
(CIJ)



Kodak  
ULTRASTREAM



Kodak Array

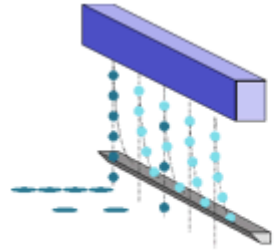


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# Print Heads –Continuous (CIJ)

BEST BEFORE 10/09/2030  
LOT 54B722AA L2 09:53

Continuous  
(CIJ)



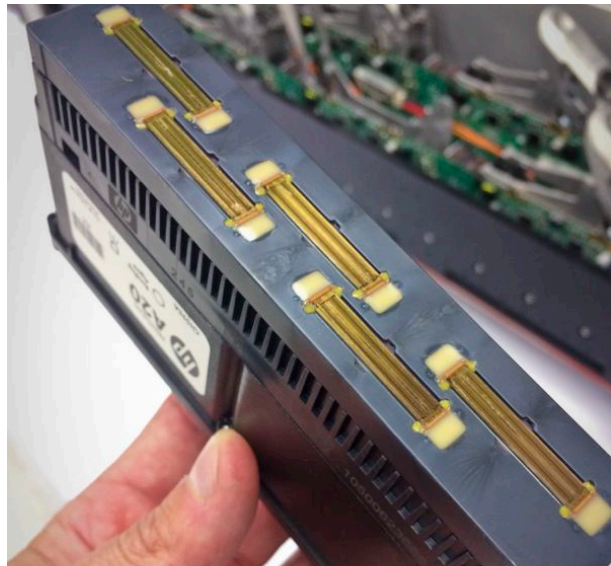
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# Print Heads –Thermal (DOD)

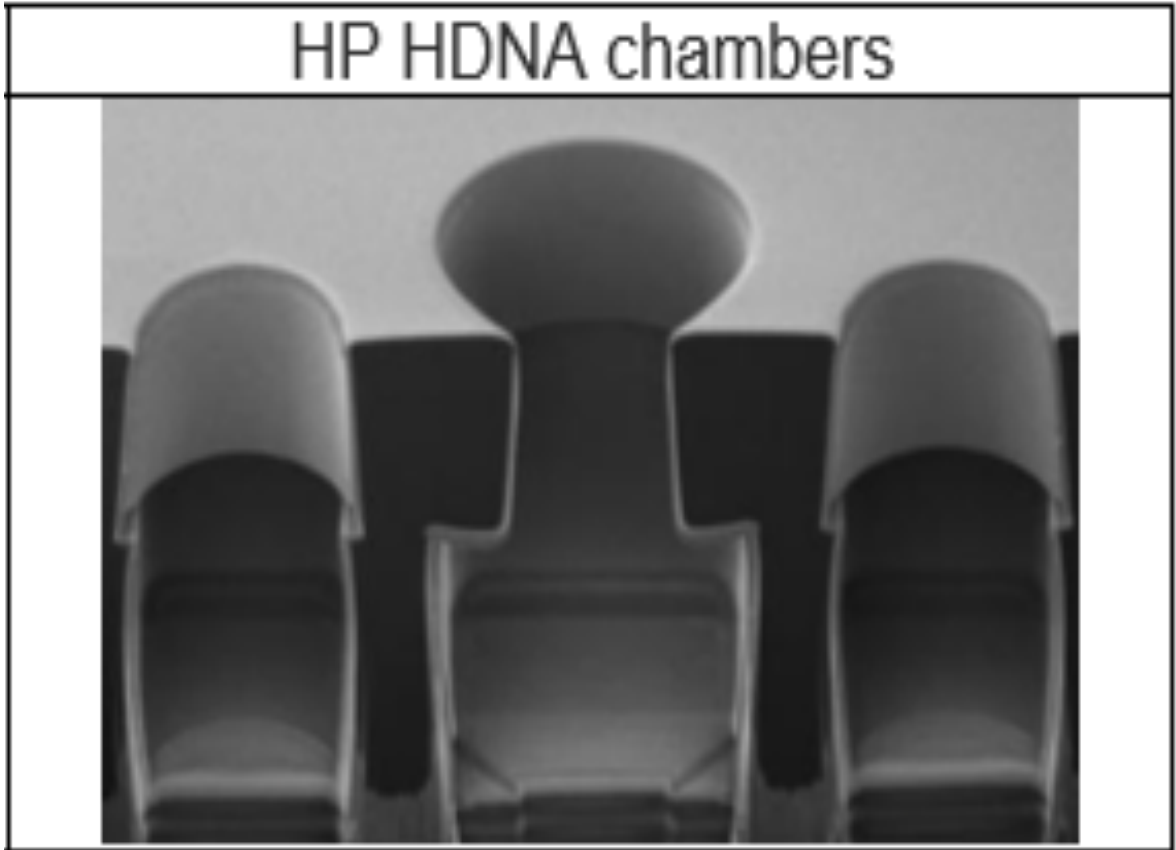
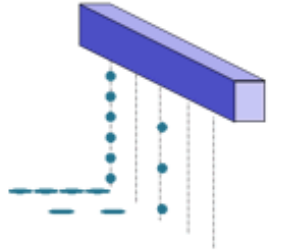


HP HDNA



HP Array

Thermal  
(DOD)



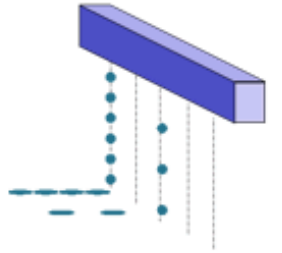
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# Print Heads –Thermal (DOD)



Thermal  
(DOD)



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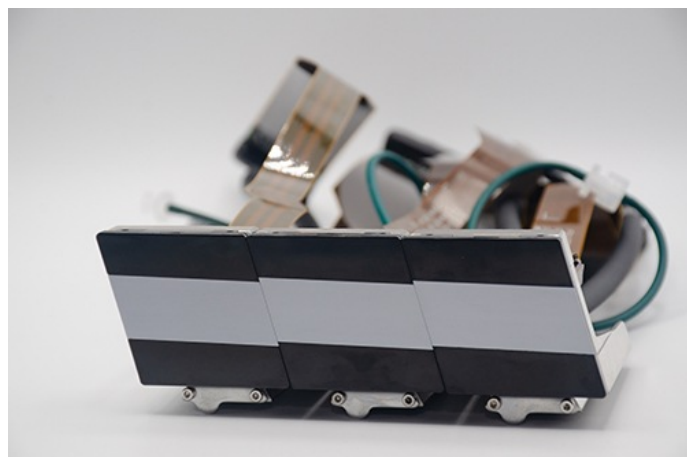
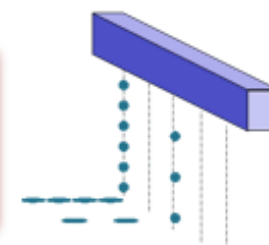
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# Print Heads –Piezo (DOD)

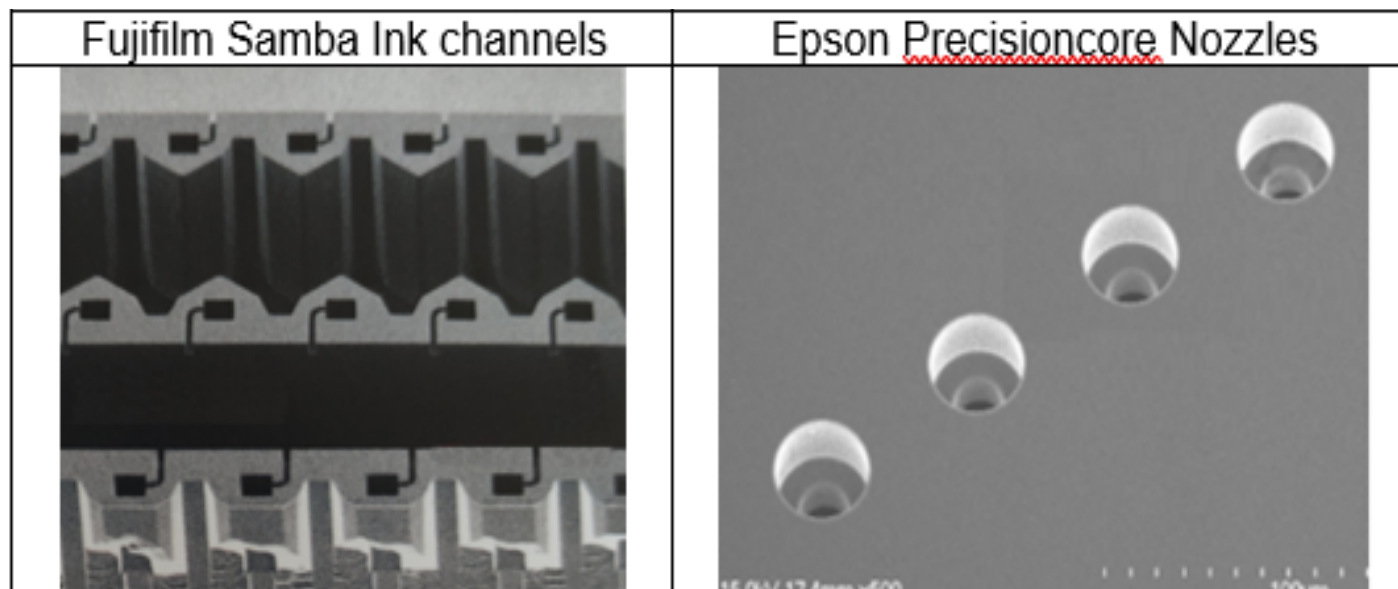


Fuji Samba

Piezo (DOD)



Fuji Samba array

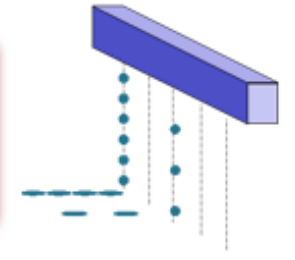


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# Print Heads –Piezo (DOD)



Piezo  
(DOD)



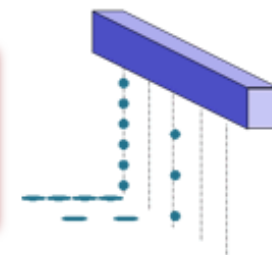
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# Print Heads – Valve (DOD)



Valve  
(DOD)



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# Print Heads –Head Markets / Requirements

MARKET	HEAD TYPE	REQUIREMENT
Coding and Marking	CIJ, TIJ, PIJ, VALVE	Adhesion, drying
Wide Format Graphics	TIJ, PIJ	Adhesion, weathering
Transaction / Promotional Print	CIJ, TIJ, PIJ	Color, cost
Newspaper	CIJ, TIF, PIJ	Cost, dry speed, color
Ceramic Tiles	PIJ, VALVE	Color / function, cost
Electronics	PIJ, TIJ, CIJ	Function
Label Printing	TIJ, PIJ	Cost, color, resistance
Packaging	TIJ, PIJ	Cost, function, color
3D Printing	TIJ, PIJ	Function, Cost
Décor	TIJ, PIJ	Color fade, cost
Textiles	CIJ, VALVE, TIJ, PIJ	Color, fastness, feel

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# Ink is Considered the Blood of the Printhead

*Fun Fact: Blood plasma is about 1.4-1.7cP at 37°C, which is just right for TIJ heads to fire.*



# Print Heads –Market / Ink

Ink type					
Aqueous	Solvent	Oil	Hot Melt	Energy-cured	Hybrid
Print Head Type					
Thermal - Continuous	Thermal - Continuous	Thermal - Piezo	Piezo	Piezo	Piezo
				Wide format graphics	
				Labels	
Paper, Textiles		Paper	Wide format graphics	Glass	Graphics (solvent-UV/Aq-UV)
Wide format graphics	Wide format graphics	Ceramics	Coding & Marking	Bottles / Shapes	Packaging (solvent-UV/AQ-UV)
Décor, Edible Inks	Coding & Marking	Glass	Electronics	Packaging (LM)	Glass
Electronics, Ceramics		Coding	Manufacturing	Manufacturing	Edible Inks (oil-hotmelt)
Coding & Marking		Electronics	Edible Inks	Ceramics	Electronics manufacturing
				Décor	(hot-melt-UV)
				3D printing	

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## Upcoming Explainers

- **March 16th 2021 at 1pm EST - Understanding Inkjet Media Qualification with Mary Schilling**
- **April - Inkjet Ganging and Imposition Explained by Pat McGrew and Elizabeth Gooding**

# Questions?

Inkjet Insight provides valuable tools and resources to help companies objectively **evaluate** the potential of inkjet for their business, **optimize** their operations and **grow** their businesses using production inkjet.

Our Message to Printers, OEMs and the Industry at Large

Evaluate. Optimize. Grow.

Repeat



Need something explained?  
Let us know.

**For more information please contact:**

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**Elizabeth Gooding**

[Elizabeth@inkjetinsight.com](mailto: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 media qualification support.