NSC Technical Subcommittee Call Minutes – August 19, 2025

Participation [by region]:

2: Maxwell Graham - **NJ**
3: Lucas Hershey, Kristina Snurkowski & Jeremy Hancher – **PA**
4: Donovan Grimwood – **TN**; Brittany Kring – **KY**; Jessica Dalton & Dylan Edeker – **FL**; Sherry Waldron - **GA** and Tony Pendola – **NC**
5: Emery David, Emily Ohde, Jennifer Theodore & Troy Johnson – **MN**; Jennifer Feyerherm & Lisa Ashenbrenner-Hunt -**WI**; Tamara Girard – **OH** and Leigh Anne Harvey, Tammy Haug, Chrystal Wagner, Malorie Medellin, Julie Rhodes & Mark Stoddard – **IN**
6: Owen Mills - OK
7: Cris Brazil & Leena Divakar – **KS** and Bob Randolph – **MO**
8: Michael Gustafson – **MT** and Jesse Walters – **CO**
9: Alex Torres – **AZ**
10 Belinda Breidenbach - **ID**

Unknown: Winston Wood

Tech-Subcommittee: https://nationalsbeap.org/committees/technical

** ***This presentation was recorded and will be posted on the National SBEAP YouTube channel at*** https://www.youtube.com/channel/UC5PupYpZ1W6IG8CtzCINK8Q **

How Digital Printing Impacts a Print Facility's Environmental Footprint

Gary Jones, PRINTING United Alliance

***Condensed & Summarized T*ranscript**

Copilot M365

Digital Printing Impacts – SBEAP Tech Summary

Date: August 19, 2025
Presenter: Gary Jones, Printing United Alliance
Host: Julie Rhodes & Mark Stoddard, IDEM

Introduction

Digital printing is rapidly transforming the printing industry, offering cleaner, faster, and more flexible alternatives to traditional analog methods. Gary Jones, with 38 years in environmental health and safety for the printing sector, shared insights into this ongoing digital revolution.

What Is Printing?

Printing is the mass application of text and images for communication. It's present in nearly every aspect of daily life—food packaging, clothing, dashboards, signage, and more. Despite its ubiquity, it remains an underrecognized industry.

Analog vs. Digital Printing

Analog Printing Methods:

- **Screen printing** – apparel and industrial surfaces
- **Lithographic printing** – books, magazines

- **Flexographic printing** – packaging like chip bags
- **Gravure printing** – long-run items like stickers and laminates

Digital Printing Technologies:

- **Electrophotographic (Xerox-style)** – dry toner, 4-color process
- **HP Indigo** – liquid toner, high-quality short runs
- **Landa Nanographic** – water-based, emerging tech
- **Inkjet** – most versatile; used for textiles, signage, packaging
- **Dye Sublimation** – permanent image bonding to polyester
- **Direct-to-Garment/Film** – custom apparel and fabric items

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Environmental Benefits

Digital printing significantly reduces:

- **VOC emissions** (especially with water-based inks)
- **Hazardous waste** (e.g., solvents, silver from film)
- **Solid waste** (e.g., fewer plates, less packaging)

Prepress processes have evolved from film-based to direct-to-plate/screen systems, eliminating photo chemicals and reducing pollution.

Challenges & Considerations

- **Run length and cost** still favor analog for high-volume jobs
- **VOC emissions** remain a concern for solvent-based digital systems
- **Ink and cartridge disposal** may require hazardous waste handling
- **Dryers and curing systems** vary in emissions based on ink type

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Trends & Innovations

- **Packaging** is a booming sector, driven by e-commerce and customization
- **Sustainability** is now a business imperative, with growing use of bio-based inks
- **Direct-to-substrate printing** (e.g., on curved containers) is expanding

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Audience Q&A Highlights

- **Food printing** requires FDA-approved components
- **Heavy metals in pigments** are largely phased out; most inks are organic
- **VOC retention factors** are not yet established for digital technologies
- **Analog still preferred** for long runs, fine art, and specialty finishes
- **Bio-based inks** are growing in use, especially in sustainable supply chains

Bio

Gary Jones
Vice President, Environmental, Health, and Safety Affairs
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His primary responsibility is to monitor and analyze EHS regulatory activities at all domestic and some international government levels. He provides representation on behalf of the printing and specialty graphic imaging industry. In doing so, Mr. Jones works closely with the federal and state-level Environmental Protection Agencies (EPA), Occupational Safety and Health Agency (OSHA), Department of Transportation (DOT), and other agencies. He also provides membership assistance on EHS compliance and sustainability programs through a variety of approaches including responding to inquiries, presentations, writing, and consulting services.

Mr. Jones is also supporting PRINTING United Alliance's efforts for the Sustainable Green Printing Partnership (SGP). SGP is dedicated to assisting printing operations respond to the customer demand for sustainable printing.

He holds a BS in biology from LaRoche College and an MS in chemistry from the University of Pittsburgh.

Future topics:

- **September 16:** (*tentative*) – Stationary Engines, Interpretation of Rules & the 50-hour Demand Response System, Melanie King, EPA – *pending management approval*
- **October 20 – 22:** Annual Training, Salt Lake City, Utah
- **November 18:** Updates to the National Compliance Assistance Center – ComplianceAssistance.net – Lisa Stobierski, National Center for Manufacturing Sciences or an EPA surrogate – *pending management approval*
- **December 16:** To be determined

Next Call: September 16

1 pm CDT (2 pm EDT) (3rd Tuesday of month)

Overview of Digital Printing

Presented By:

Gary Jones

Vice President – EHS Affairs

Printing United Alliance

What Is Printing?

- Application of text & images for mass communication
- Printing's Advantages
  - Inexpensive to mass produce
  - Inexpensive to distribute
  - Durable
  - Stylish

What Is Meant by Digital?

Different than traditional …

Digital Pre-Press

- Use of computer-generated film
- Use of direct to plate technology
- Use of direct to screen technology
- Reduces Waste
  - No film, photo processing chemicals
  - Plate/screen chemistry becoming less harsh, water-based, and lower pH.
  - Some litho plates do not need to be developed.
- Advantages -- both for business and the environment

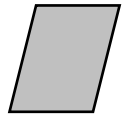
Analog Prepress


Design


Type


Camera


Stripping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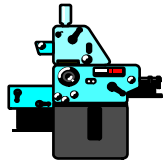
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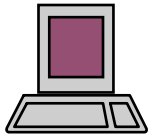
Finishing

Almost Digital Prepress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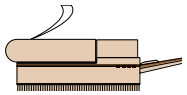
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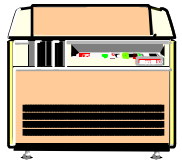
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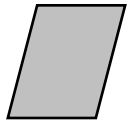
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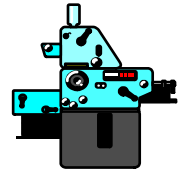
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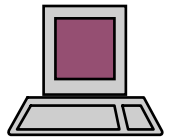
Finishing

Digital Prepress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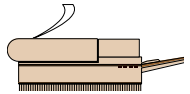
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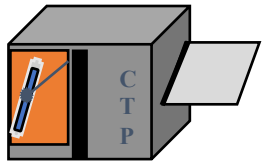
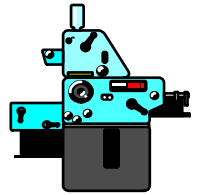


Computer to Plate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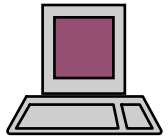
Finishing

Digital Printing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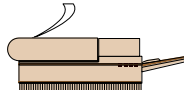
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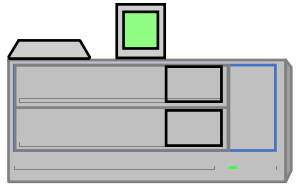

Digital Printing

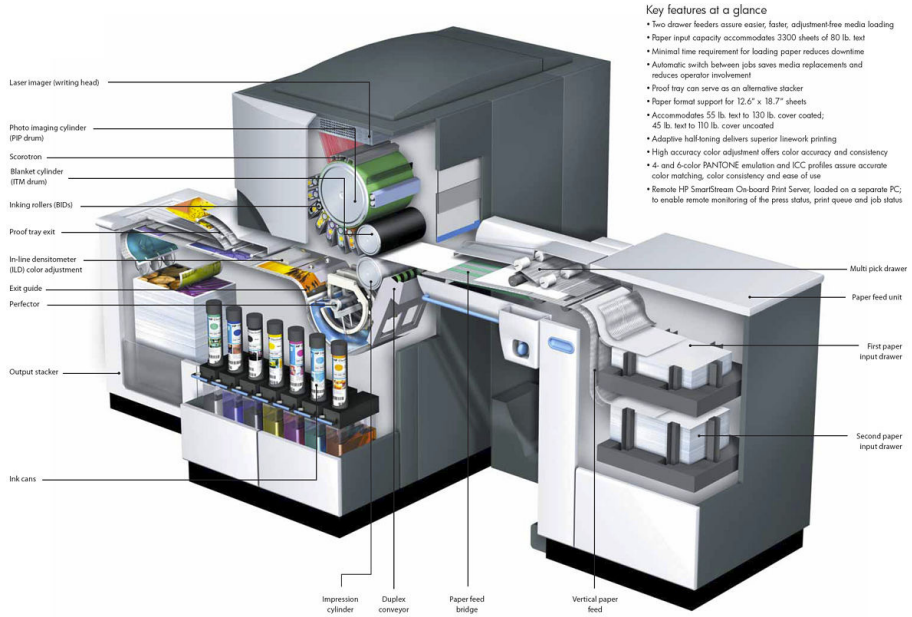

Finishing

Electrophotographic Printing

- A laser beam creates an electrostatic image on a photoreceptor drum.
- Toner (powdered ink) sticks to the charged areas and is then transferred to the substrate and fused using heat and pressure.
- Can include inline binding and finishing
- Applications: Office documents, labels, packaging, and short-run commercial printing.

ElectroInk (HP Indigo)

- A laser beam creates an electrostatic image on a photoreceptor drum
- Liquid ink sticks to the drum and are transferred to a blanket and then to the substrate.
- It combines the quality of offset with digital flexibility.
- Applications: Commercial printing, labels, photo books, and packaging.



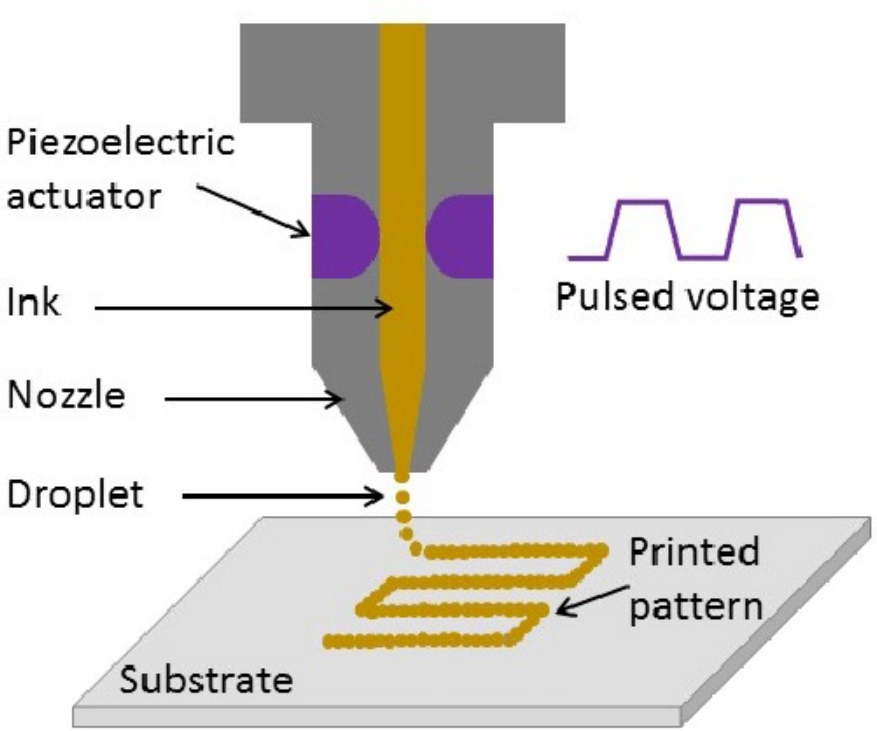
Nanographic Printing (Landa)

- Uses nano-pigment water-based inks that are ejected onto a heated blanket, forming a dry ink film that is then transferred to the substrate.

- Applications: Commercial printing, packaging, and publishing.

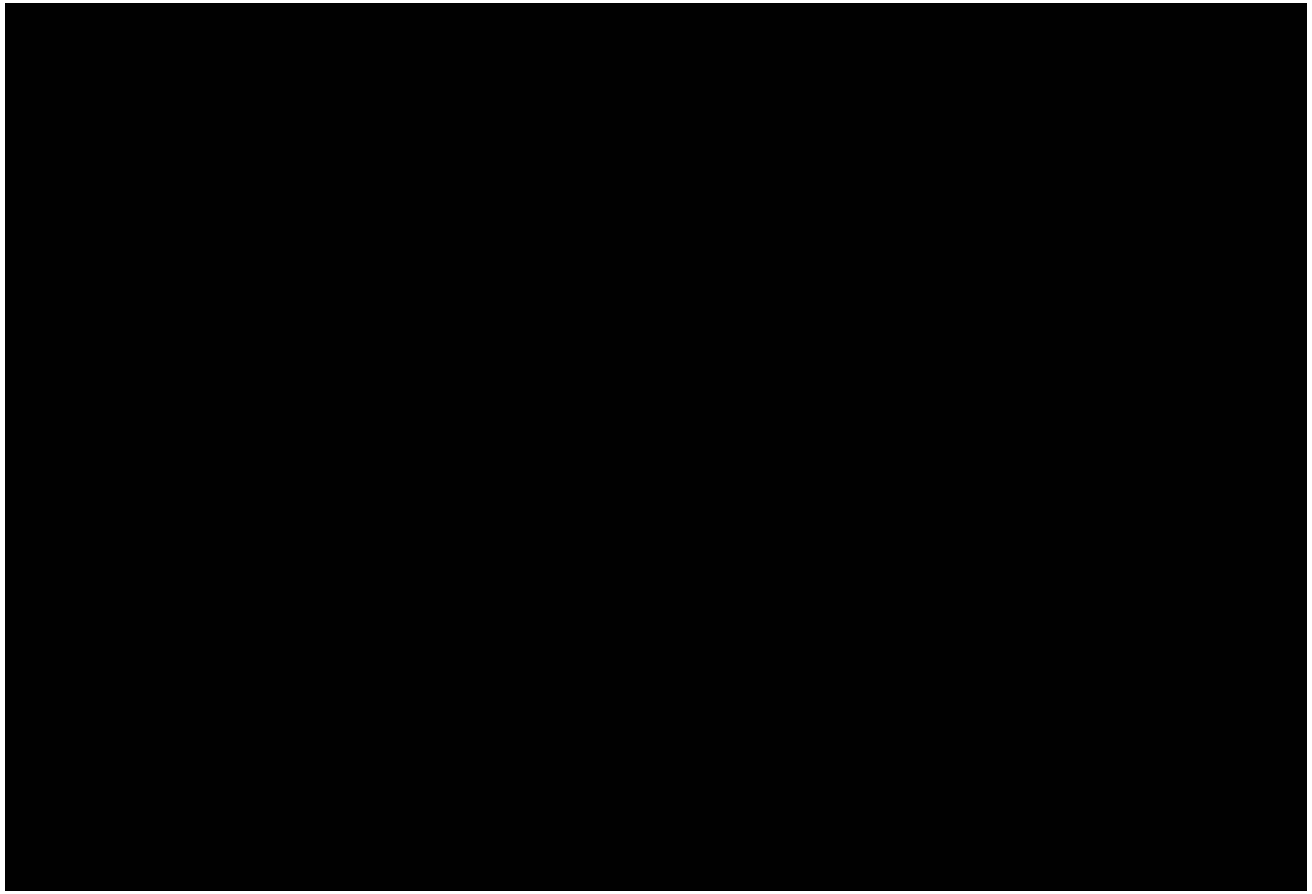
Inkjet Printing

- Inkjet printers spray tiny droplets of ink directly onto the substrate (paper, fabric, plastic, etc.).
- There are two main types:
  - Thermal Inkjet: Uses heat to create a bubble that forces ink out of the nozzle.
  - Piezoelectric Inkjet: Uses a piezoelectric crystal that changes shape when voltage is applied, pushing ink out.
- Applications: Home/office printing, commercial printing, wide-format printing, textile printing, and packaging.



Inkjet Printing

- Ink types
  - Water-based
  - Solvent-based
  - UV cured
- Device types
  - Flat bed
  - Wide format
  - Roll-to-Roll
  - Production Sheetfed
  - Production Webfed



Dye Sublimation Printing

- Solid dye is heated until it turns into gas and bonds with polyester or polymer-coated surfaces. It becomes part of the material, resulting in vibrant, durable prints.

- Applications: Fabric printing, promotional items, photo printing, and signage.

Direct-to-Garment (DTG) Printing

- DTG uses specialized inkjet technology to print water-based inks directly onto fabric, typically cotton.
- The garment is pre-treated to help the ink adhere and to enhance color vibrancy.
- After printing, the garment is heat-pressed or cured to set the ink.
- Applications - Cotton and cotton-blend fabrics.
  - Designs with gradients, photos, or intricate details.

Direct-to-Film (DTF) Printing

- Prints designs onto PET film using specialized inks.
- Applies hot-melt adhesive powder to the wet ink.
- The film is cured and then heat-pressed onto the garment.
- Applications: Versatile apparel printing for cotton, polyester, blends, nylon, and more.
- Accessories: Tote bags, hats, and other fabric-based items.

Environmental Issues

- Toner and ink jet cartridges **may** be considered hazardous waste
- Solvent and water-based ink jet inks do emit VOCs and possibly some HAPs
- Indigo and Landa emit VOC
- Indigo generates waste imaging oil
- Spent direct to plate chemistries
- Solid Waste Issues
  - Printer cartridges/ink containers
  - Computer monitors and used equipment.

Questions?

Thank You for Listening!

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