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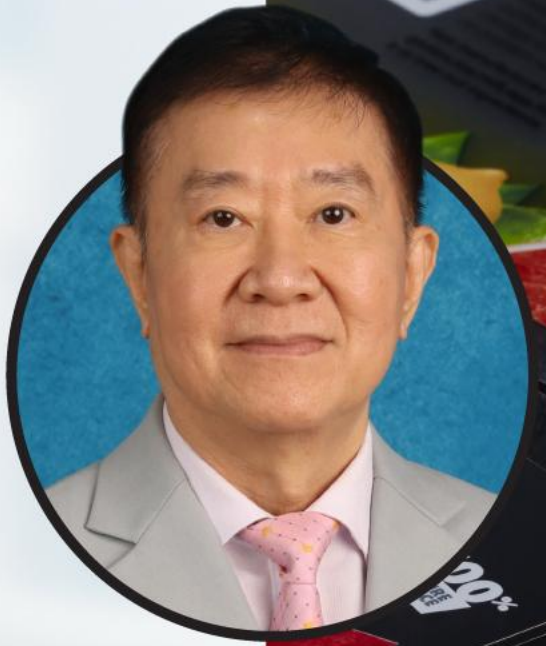
THE ADVANCEMENT
OF DIGITAL PRINTING TECHNOLOGY
IN CREATING VALUE-ADDED PRINT



Prof. Dr. Aran Hansuebsai
Chulalongkorn University,
Lecturer, Department of Imaging and Printing Technology

CONTENT OUTLINE

- Global trends and current status of the packaging printing market
- Digital printing market
- Consumers' perceptions of today's packaging
- Key factors that printers should consider about packaging trends when expanding their business using digital printing technology

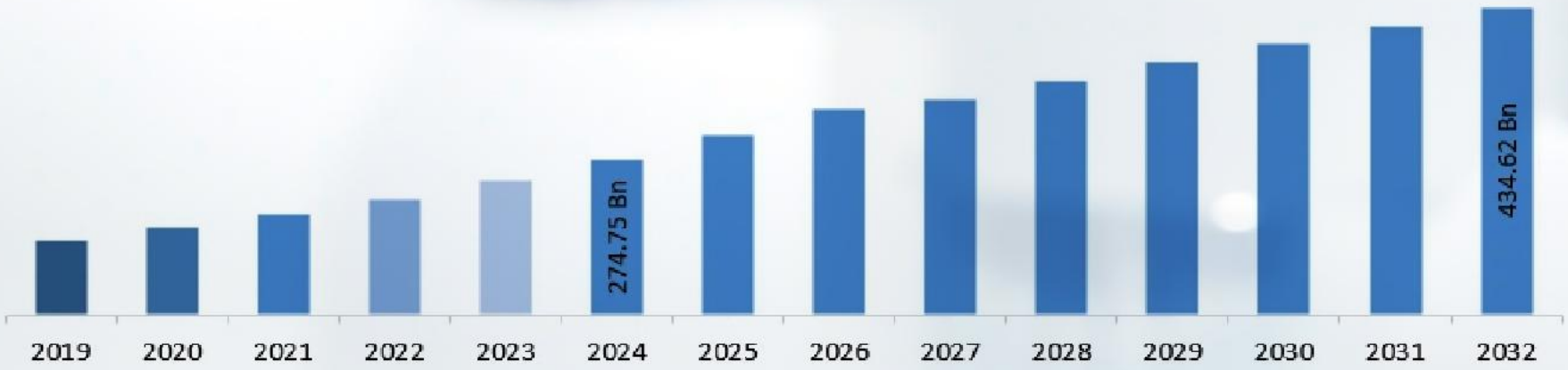
GLOBAL DIRECT

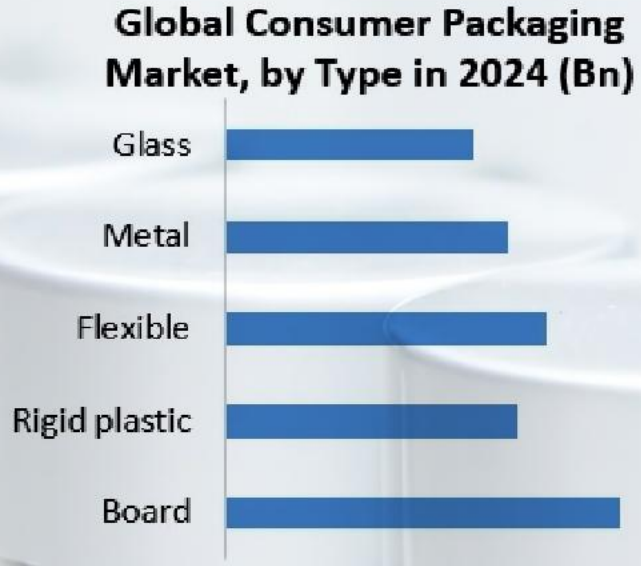
TO PACKAGING PRINTER MARKET SIZE, 2025-2032

Source: www.persistencemarketresearch.com

GLOBAL CONSUMER PACKAGING

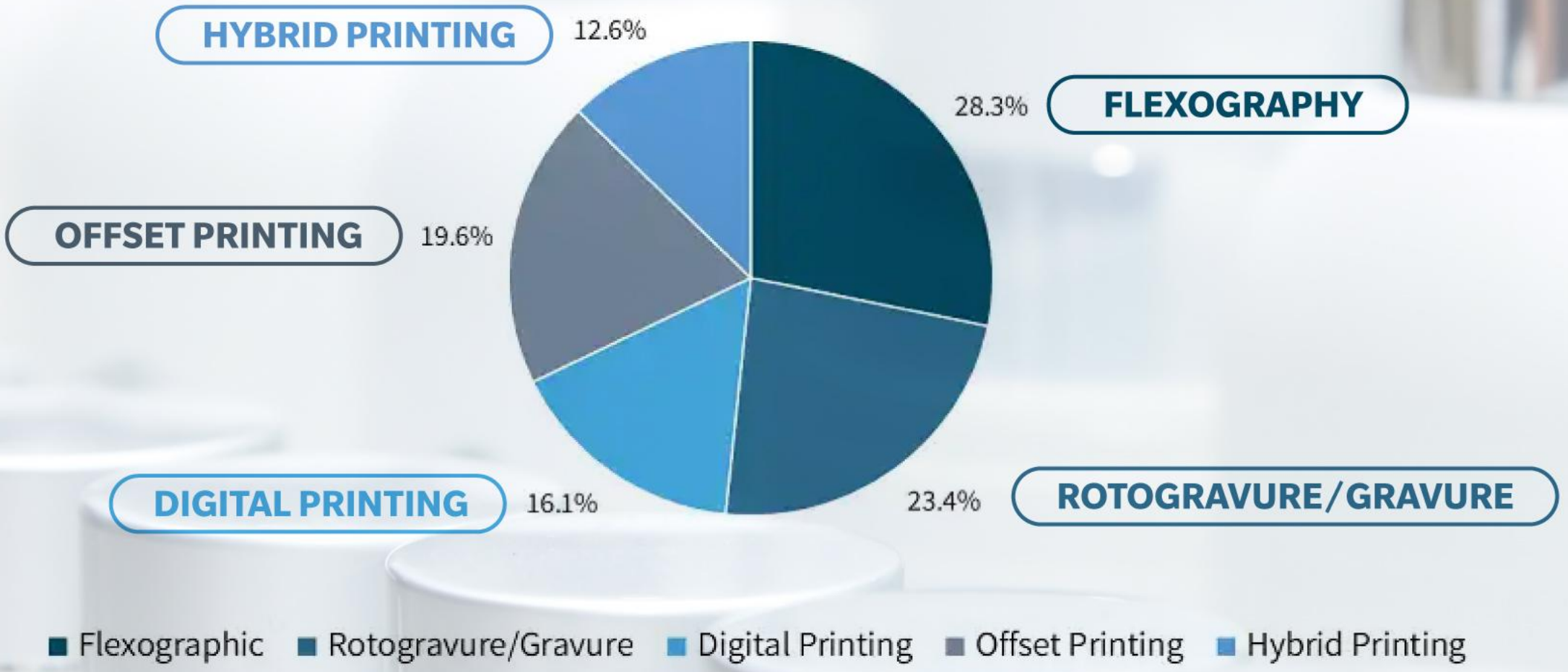
MARKET SIZE IN USD BILLION (2019-2032)





GLOBAL PACKAGING PRINTING

MARKET SHARE (2024)



Source: www.gminsights.com

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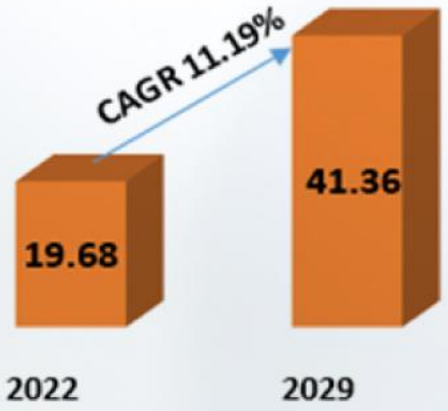
DIGITAL PRINTING
PACKAGING MARKET



Market Size in US$ Billion

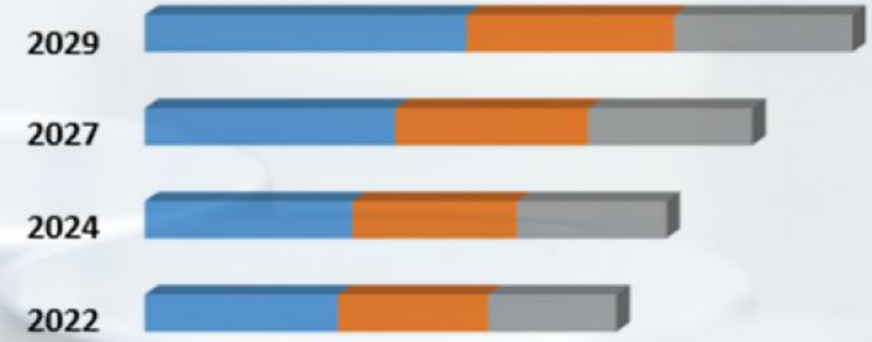
Key Players

WS Packaging Group, Inc.
Xerox Corporation.
Mondi
Xeikon.
Quantum Packaging Store
Eastman Kodak Company.
TRACO.
HP Inc.
Quad/Graphics, Inc.
Labels in Motion
Reel Appeal
Anglia Labels
Cenveo Corporation
SCREEN Holdings Co., Ltd.
EC Labels Ltd.
Edwards Label, Inc.

Regional Analysis in 2022 (%)

- North America
- Europe
- Asia Pacific
- Middle East & Africa
- South America

Type Segment Overview



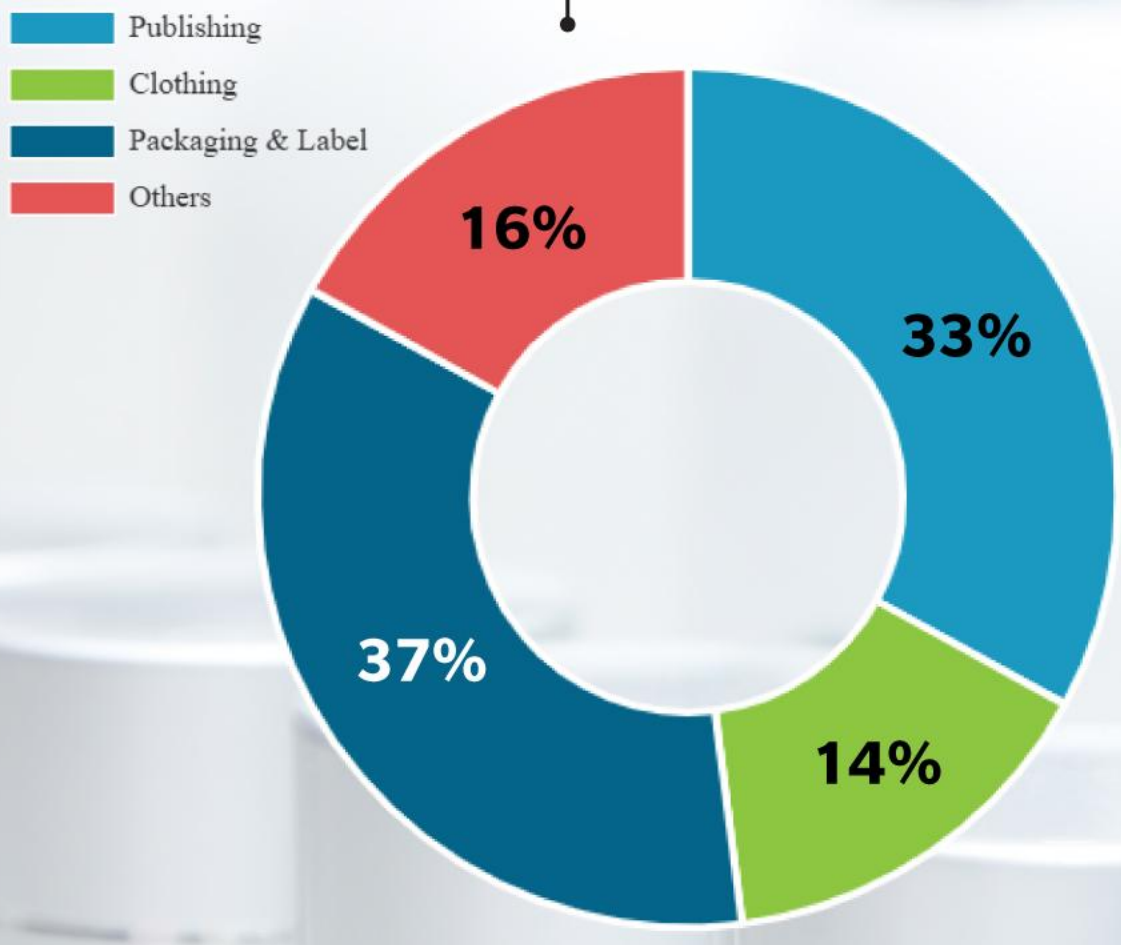
Labels | Flexible Packaging | Others

MMR

ADVANTAGES
OF DIGITAL PRINTING

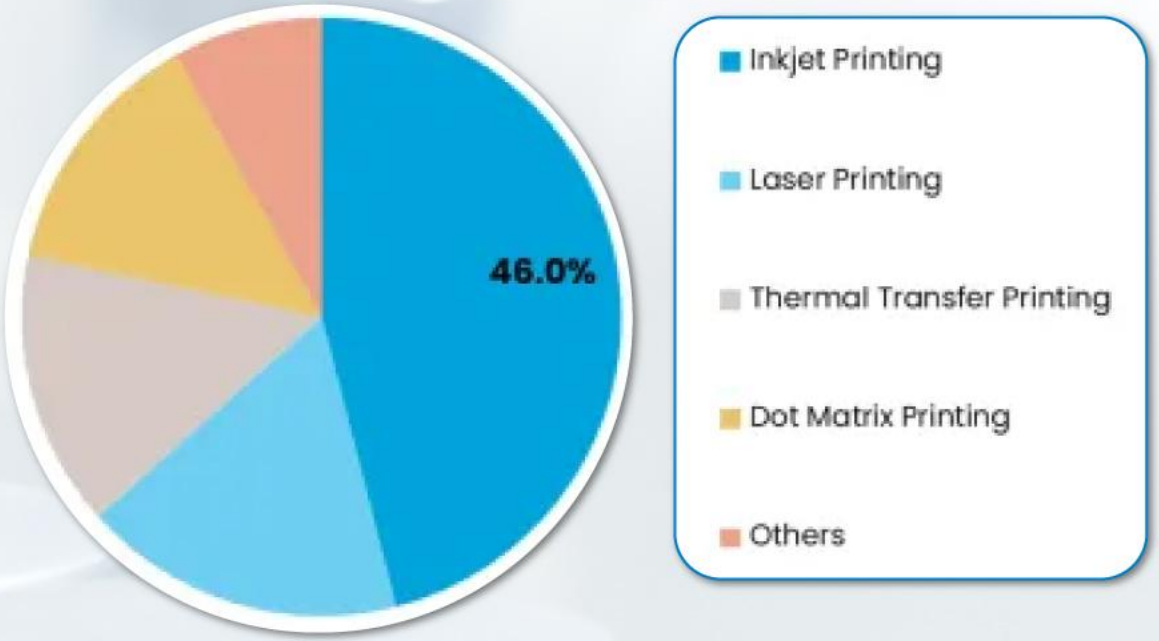
GLOBAL DIGITAL PRINTING

MARKET SHARE, BY END-USER, 2022



Industrial Printer Maket

Global Analysis by Technology Type



www.fortunebusinessinsights.com

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DIGITAL PRINTING SYSTEM

INCLUDES

- **Digital Front End** (DFE)
  receives a digital file and sending instructions to the digital printing unit.
- **Printing unit** (e.g., inkjet or laser)
  applies the ink or toner to the substrate.
- **An in-line quality measurement device**
  such as a spectrophotometer, checks print quality on the fly and sends feedback to the DFE for automatic adjustments to ensure consistency.

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EFFICIENT DIGITAL PRINTING SYSTEM

- **DFE**
  processes high-resolution image data quickly; applies color management and RIP in real time and integrates with production workflow.
- **Printing unit**
  improves high-speed, high precision, and built for bold creativity.
- **in-line quality measurement device**
  such as a spectrophotometer, checks print quality on the fly.

PACKAGING Labelling

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WHAT'S GOING ON IN SHOPPING THESE DAYS?

How Packaging Shapes Customer Perceptions and Brand Recognition?

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THE ROLES OF PACKAGING IN MARKETING TODAY IS TO

- Catch the buyer's eye
- Communicate the unique selling proposition (USP) in just a few seconds
- Engage with consumers through connectivity
- Environmentally friendly packaging

66%

Of consumers have avoided a particular product or brand for environmental reasons

40%

Of the plastic waste in the world is plastic packaging

51%

Of millennials check packaging for sustainability claims

Sources: itbpackaging & Neilson global sustainability report

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3 THINGS TO CONSIDER ABOUT PACKAGING TRENDS

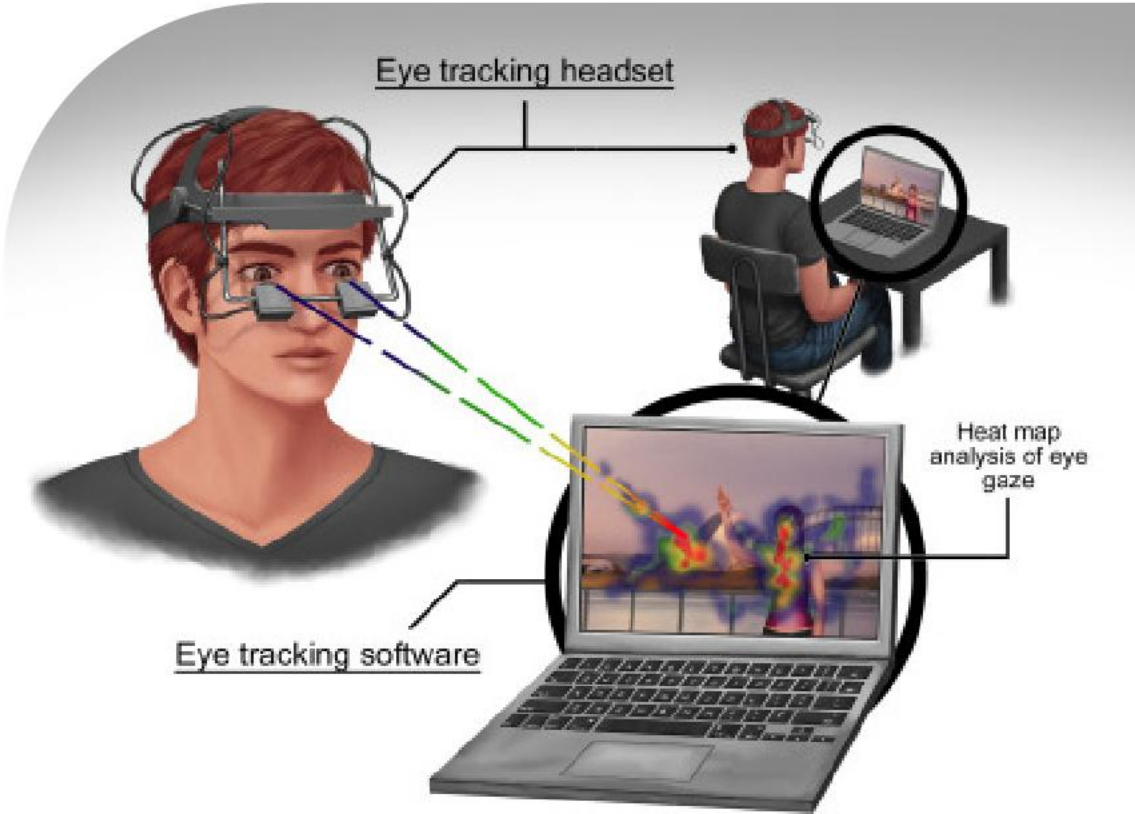
Expanding Your Printing Business

Using Digital Printing System

EYE TRACKING TEST

FOR PACKAGING DESIGN

It provides data on where consumers look, for how long, and in what order to optimize designs for noticeability, brand recognition, and clarity of key features.



RESULTS OF EYE TRACKERS

We will understand what elements are most effective for grabbing attention, communicating a message, and influencing a purchase.

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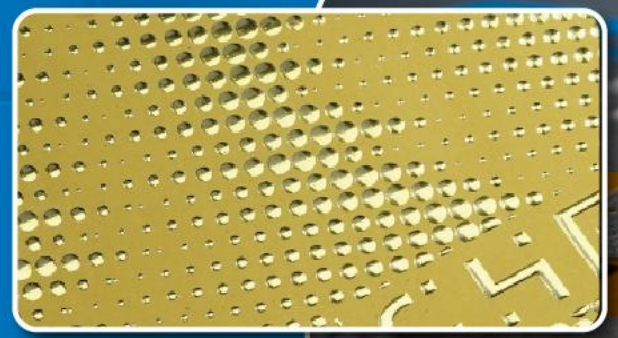
1 PRINT EMBELLISHMENT

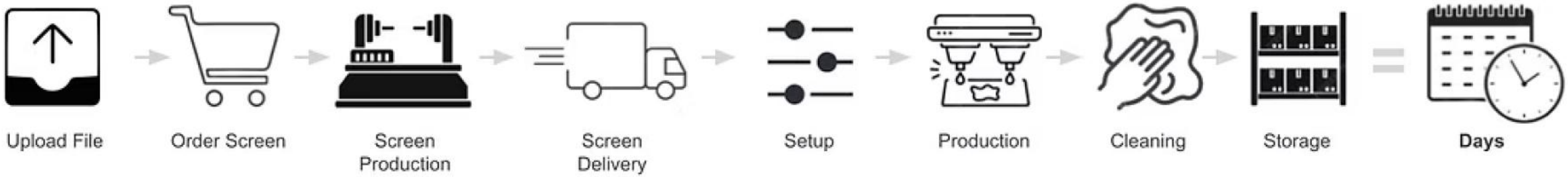
Elevate your print with digital embellishment effects that create **texture, shine, and depth** — giving the products a premium shelf presence through **foil stamping, embossing, and spot UV coating.**



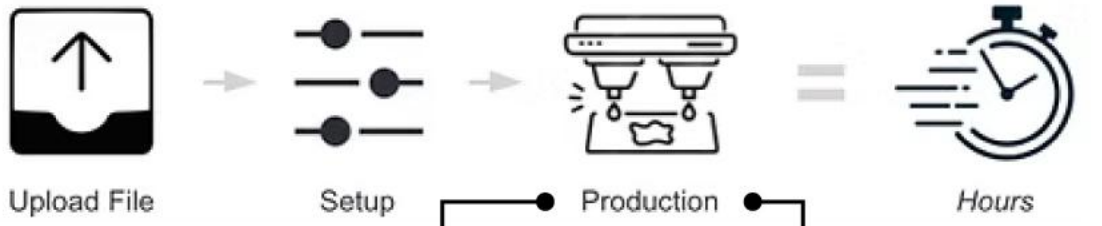
DEFINING DIGITAL PRINT EMBELLISHEMNT

CONVENTIONAL MATERIALS IN A DIGITAL PROCESS

ANALOG PROCESS



DIGITAL PROCESS



Faster, Versatile, and More Efficient

Enhanced Personalization and Variable Print

DIGITAL EMBELLISHMENT PRESS

Konica Minolta's AccurioShine 3600 with iFoil One option

- UV spot, 3D Emboss and Hot Foil in one pass
- Variable data foil that is unique to the market

B2-size JETvarnish 3D 52L with iFOIL L Foiling Unit

- Digital 2D/3D Spot UV with Inline Hot Foiling

PRESS TECHNOLOGIES

- On-the-fly drying and curing with integrated LEDs
- Superior adhesion using hot foil stamping technique
- Compact in-line system
- Accurate registration with Artificial Intelligence scanning technology
- Variety of substrates to be used such as paper, plastics, synthetics and cartons, with inline corona treatment system
- Shorter lead times and a simple job set-up
- Vacuum belt feeding system

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EXAMPLES OF

DIGITAL EMBELLISHED PRINTS

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2 SUSTAINABLE PACKAGING

Digital printing systems can help printing businesses move toward sustainability through **reduced waste, the use of eco-friendly materials, and lower energy and material consumption** — resulting in products that are environmentally friendly.

SUSTAIN THE PLANET

SUSTAIN OUR FUTURE

REDUCE PRINTING WASTE

WITH DIGITAL PRINTING TECHNOLOGY

Print on demand to eliminate overstock

Save time and setup waste, increasing efficiency

Reduce ink, substrate, and **water consumption**

Save energy and **reduce your carbon footprint**

DIGITAL PRINTING PRESS

+ REAL-TIME COLOR STABILITY AND REGISTRATION CONTROL

AccurioLabel 400

+ Intelligent Quality Optimizer (IQ-520) color management

functionality for real-time color stability
and registration control

- Print data is processed at a resolution of 1,200 dpi x 2,400 dpi
- Operation is intuitive by following on-screen instructions; no need for extensive user training
- Colour adjustments, colour registration control and calibration are fully automated with **Intelligent Quality Care**

  - Real-time colour stability control
  - Real-time colour registration control
  - Automatic calibration
  - Automatic density adjustment
  - Profile creation

CARBON FOOTPRINT CERTIFIED

ISO 14067

ISO 14067 Carbon Footprint Certified

XXXg

CIRCULAR ECONOMY

carbon neutral

NET ZERO

carbon footprint standard — Carbon Neutral Organisation

carbon footprint standard — CO_2e Reduced Organisation

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3 SMART PACKAGING

THE FUTURE HAS ARRIVED

"Smart packaging" is one of the most exciting innovations in modern packaging technology.

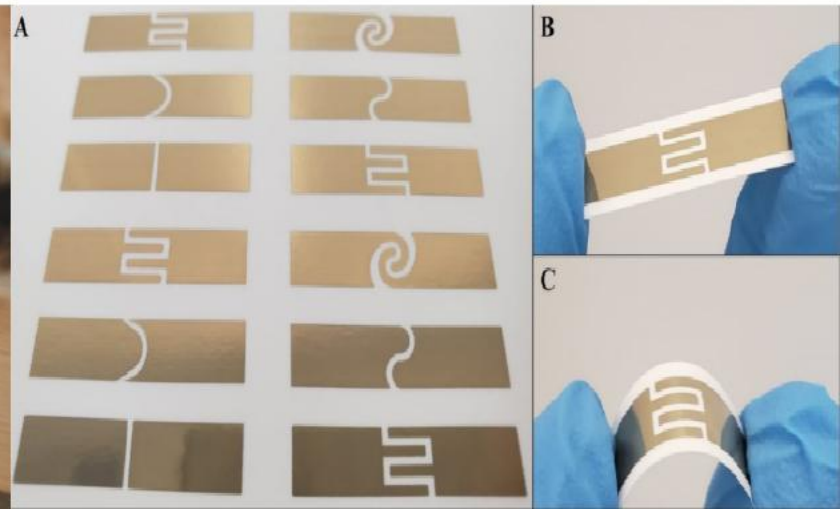
DIGITAL PRINTING SYSTEMS

CAN PLAY A MAJOR ROLE IN CREATING SMART PACKAGING, ESPECIALLY IN CONNECTED PACKAGING ERA.

Connected packaging can be created by printing functional features such as **QR codes, barcodes, NFC tags, and AR (Augmented Reality)** to link the package to online content or data.

SMART PACKAGING THAT CONNECTS

THE DIGITAL AND PHYSICAL WORLDS

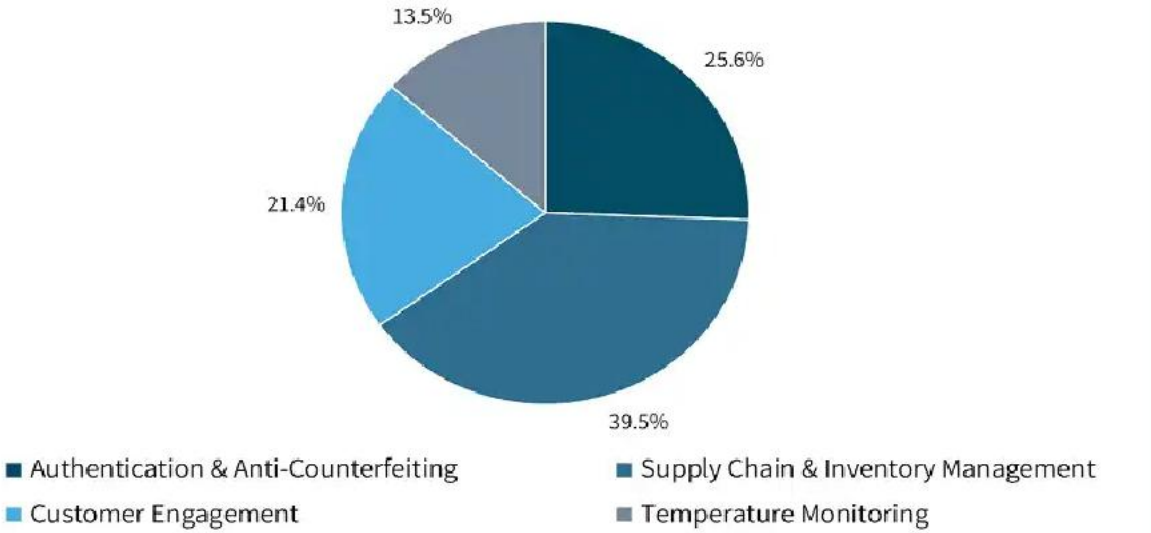


PRINTED ELECTRONIC APPROACH

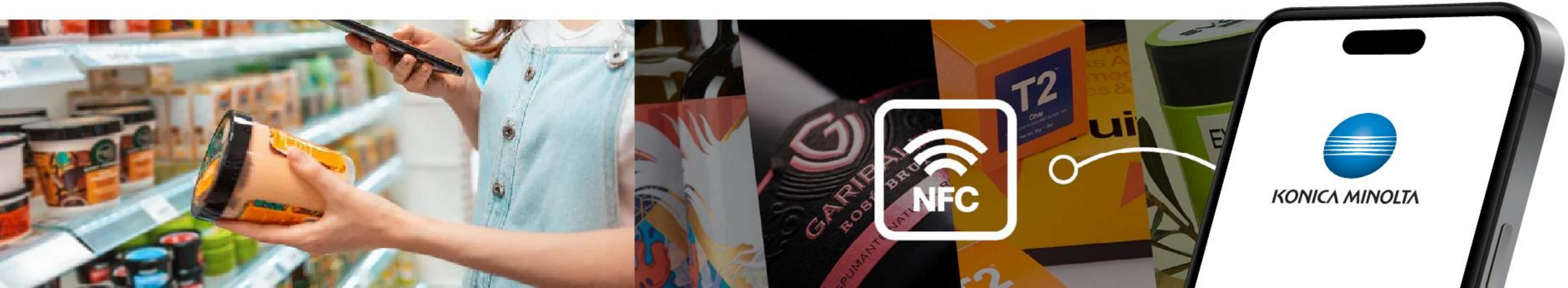
Some advanced digital printing systems use conductive inks to print electronic circuits (NFC Antenna) directly onto packaging or labels.

The printed Antenna is then connected to a tiny microchip.

NFC Enabled Packaging Market Share, By Application, 2024



Source: www.gminsights.com



DIGITAL PRINTING

A GAME CHANGER FOR PACKAGING AND LABEL

- Short-run & On-demand production
- Personalization & Variable Data Printing (VDP)
- Faster time-to-market
- Sustainability
- High-quality & Creative Finishing (embellishment)
- Integration with Smart Packaging

CONCLUSION

Printing is evolving beyond aesthetics. It now enables Brands to create prints that consumers can perceive, connect with, and experience, whether through sustainability, premium design, or smart technology. Embracing these trends is essential to remain competitive in the modern market.

DIGITAL PRINTING CAN FULFILL THESE REQUIREMENTS!

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WHAT DOES THIS MEAN FOR PACKAGING PRINT PROVIDER?

- More agile manufacturing and effcient supply chain
- Automation
- Speed to market
- Personalization
- Innovative packaging
- New business models for growth

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