Achieving the Newest Generation of Flexo Plate Capabilities and Its Implementation

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Introduction

- Introduction
- Issues Faced By Flexo In 2007
- Foundations Of Flexcel NX
- Continued Challenges In Flexo
- Next Generational Solutions
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The Issues Faced In 2007 By Flexo

- Flexo in 2007 faced many challenges and issues to continue its growth in the global market place:
  - Inconsistency was the normal
    - Round top dots were sensitive to operator impression changes and wear
    - Heavy ink usage but still poor solid ink densities caused “muddy” colors
  - Increased costs for digital plates
    - Insufficient plate life, long setup times, and on press inconsistency
  - One dominant imaging technology in LAMS (Laser Ablative Mask System) for all digital plates – “good enough” limited innovation
    - Carbon layer or black polymer mask layer with high power lasers
  - Lack of innovation drove brands to relook at offset and rotogravure
    - Supported by innovation in offset plus gravure imaging and costs
Foundations Of Flexcel NX

- IN 2008 Kodak commercialized the Flexcel NX system
- New Flexo plate system that introduced digital flat top dots to the mass flexo market
- It had 5 unique initial foundations
- DigiCap NX was introduced in 2010 to address the solid ink densities
Core Technologies For Flexcel NX In 2008

- SQUAREspot imaging is foundation of offset printing, 16,000 CTP in the market, up to 450 LPI AM & FM
- TIL - Thermal dye based multi-layer ablative film, capable of 800 lpi
- One NXH plate for all applications (except corrugated post-print) specified at 300 LPI, 0.4-99.6%
- Combined in one optimized solution

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SQUAREspot Technology

Gaussian Laser

Other imaging (thermal & visible)
~15 microns

laser spot from CTP

halftone dot on plate (50%)

2400 dpi grid

SQUAREspot Laser

imaging

2.5 microns

10.6 microns

2,400 dpi

10,000 dpi (4x4)

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Core Technologies For Flexcel NX In 2008

- Once the TIL is imaged, need to transfer image to NXH plate
- Simple flat bed lamination
- Results in digital flat top dot
- Exclusively produces Pixel-For-Pixel imaging from digital file to plate
- Utilizes offset dither technologies
  - “Camouflage for transitions”
- Simplifies proofing and color matching
- Predictability and consistency addressed!
Exclusive Pixel For Pixel Reproduction

- Unmatched exclusive imaging technology

File Bitmap  
Imaged TIL  
Flexcel NXH Plate
Digicap NX - Using The Imaging Technology

- Pin-holing and solid ink density remained a major limitation for all Flexo.
- Plate transfers the pattern from the anilox roll to the substrate.
  - *Cell and Cell Wall cause voids or pin-holes*.
- DigiCap NX breaks up the cell pattern on the plate surface, to stop its transfer.

Using 5x10 Micron Elements

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DigiCap NX

No surface texturization

Kodak DigiCap NX Screening Applied

Traditional plate cell patterning applied

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Plate Innovation Alone Is Not Enough – Implementation Is A Team Activity!

- Despite any leap forward in one component or technology, in printing and particularly Flexo it is not until the rest catch up that the true benefits are seem!
  - *Flexo is a system, press, ink, anilox, metering, tape, plate, substrate, drying and the press operators*
  - *Prepress required higher resolution images, for file preparation*
  - *Brands need education on what Flexo is now capable of*
  - *The whole industry is in catch up mode after a major innovation*

- Brands and end customers only see the main stream implementation 2-5 years later
  - *Was the same with 60° anilox rolls, LAMS digital plates, quick change sleeves, gearless presses*
Continued Challenges In Flexo In 2014

- **Color & Color Fidelity**
  - Pin-holing with heavy anilox volumes – whites, coatings
  - Color tonal range – spot or four color vs expanded color gamut pros & cons
  - Cleanliness of colors – relates to white base and process builds

- **Print Details**
  - Fades to zero without grainy hybrid screens
  - Keeping reverses open and clean with heavy anilox volumes
  - Dirty print and its effect on process productivity

- **Economics & Competition**
  - Relatively heavy ink deposits & effect on costs or productivity
  - Cost control for brands, looking for more for less
  - Competitive demands to increase resolution – match the 175 LPI used in Rotogravure to enable greater conversion

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The Importance Of Pin Holes To Color

- White inks are applied using high volume anilox rolls
- Very high ink volumes are used to avoid pin holes and achieve opacity
- White is the base for other colors
- Pin holes cause darkening of print, and color shift
- TAGA members spend a lot of time measuring color, but how much of a $\Delta E$ is caused by the white issues?
Pinholes Relate To The Color, Color Cleanliness And Final Tonal Range

- Image shows 2 white ink images, magnified 200X pictured over a black background, one with pinholes, one without
- Color overlay with 50% transparency illustrates the effect caused by pinholes
Next Generational Solutions

- Address white ink transfer as the base for colors
- Address highlight structure:
  - Smoother hybrid screens minimizing graininess for high resolution flexo
  - Isolated dot robustness with modern platemaking
Addressing High Volume Anilox Rolls

- The range of anilox rolls used in Flexo is huge:
  - Very low volumes for UV and process inks
  - Very heavy volumes for white and coatings
- Achieve the improved ink laydown and minimal pin holes without increasing ink usage
  - No single patterns fits all applications, but needs simple selection & implementation
  - Anilox volume is a critical parameter
- Tuesday paper will cover this in more details
Addressing Highlights

- Modern Hybrid screening optimized for flexo using SQUAREspot technology
  - 85-250 LPI with smoothest results
- Improved dot robustness with modern main exposure times
  - Utilizing “Light valve” technology first patented by Kodak for LAMS plates
  - Using same 5x10 micron elements as used in DigiCap NX
Addressing Highlights - Hyperflex NX

Without Hyperflex NX

With Hyperflex NX

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The Future Opportunities Using Flexo

- Improved ink transfer with lower volume applications
- Conversion of gravure markets to flexo
  - Must match or better gravure printing
  - Addressing demands from brands for shorter runs and more frequent design updates
- Security printing to differentiate from digital and other print processes
- Printed electronics and functional printing
Conclusions

- The flexographic printing process has advanced significantly in the last decade
- Major advances in one technology, drives advances in the full system to maximize the effect
- Major improvements and enhancements are still available in imaging and application on press
- The next generation of improvements focuses on ink laydown and highlight improvements
- Much more to come for Flexo!
Any Questions?

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