Building Micro Surface Texturization For White Inks And Coatings In Flexo

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Introduction
- Issues with white ink
- Why is white ink so important?
- Initiation of project to address white needs
- Lessons along the way
  - Size Matters!
  - Measurement Parameters & Bounce
- Custom target and results
- Conclusion

Issues With White Inks
- Color / Appearance
  - White inks are the foundation of many colors for packaging
  - Pinholes in the white result in inconsistent color for inks overprinting it, and traditional "muddy" colors in Flexo
- Economics / Productivity
  - 50% of ink spend in most flexible packaging facilities is white today
  - White is the heaviest ink deposit, requires most drying, so controls press speeds

Pinholes Relate To The Color, Color Cleanliness And Final Tonal Range
- Image shows 2 pictures of same white over a black background, one with pinholes, one without
- Color overlay with 50% transparency illustrates the effect caused by pinholes
- Circle represents spectro aperture – do the measurements change?

Development Project – Not So Easy
- Q4 2012 initiated by 2 printers using NX plates
  - One using Kodak for all plates
  - One using Kodak for all but white
- Project looked for how to optimize press conditions for white using standard DigiCap NX
- Press / component variables tested included:
  - Ink pigmentation, grind levels, ink viscosity, ink temperature
  - Anilox volume, anilox lpi, anilox format (60°, E-Flow, GTT, etc)
  - Tape compressibility, press speed, press formats, substrates, etc.

Progressive Development Of Patterns
- Results highlighted importance of size, mottle, and controlled flow
- Resulted in development of custom patterns and features to optimize ink laydown
- The steps were:
Size Alone Was Not Enough – What Next

- Utilizing the SQUAREspot head using the 5x10 micron feature (½ pixel) in DigiCap NX
- Applied for mottle reduction
- Applied various shapes to evaluate a variety of properties
- Unmatched consistency and repeatability in fine details

Lessons Learnt Along The Way

- Size matters
  - The pattern structure must match the anilox volume range
- What to measure
  - Dry ink film weight is not reliable enough, don’t use it
  - Opacity is a good guide but not enough alone
  - Visual inspection for mottle / pin holes is required
  - Mottle can be measured for verification
- Bounce is extremely important
  - Need to address bounce in the design of the targets
  - Need sufficient measurements to eliminate effect
3D Representation Of White Opacity From A Solid White Patch

Press Harmonics Around The Cylinder Also Needs To Be Addressed

- Image shows white opacity around a print cylinder
- Range of measurements is often bigger than normal difference in tests
- Need to take sufficient measurements to average results
- Highlights that spot opacity measurements alone is not sufficient

Resulted In A Unique Banded Plate Test Target

Sample View Of The Surface Patterns

- Limited set of custom patterns developed for use with high volume anilox rolls
  - *Initially suited to white solvent based inks and coatings*
  - Simple process to identify correct pattern for ink and anilox combination
  - Uses opacity measurements and magnified visual inspection

Real White Ink Print Example @ 200X

Conclusion

- Pin-holes are a critical factor in the performance of inks, especially white inks and coatings
- White is the foundation for all other colors and should be a key focus for color and consistency
- Kodak have developed specific plate surface technologies to allow minimized pin-holes and increased opacity with the same or less ink
  - Focused on simple application based on anilox volume range used
- This technology provides benefits in terms of:
  - Color gamut, color cleanliness, shelf impact
  - Productivity and press efficiency
Any Questions?

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