Unambiguous Conclusions of the Pamarco EFIo Extended Cell Shape Performance Tappi 2013 CorrExpo

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The problem

- Most high level printers suffer a 30% production time loss due to colour not being right at start-up
- This is mostly due to not knowing at start-up how much ink the screen roll will transfer
- Ink suppliers offer an ink kitchen and colour matching software to compensate for this → The changing of the ink formulation on press is what takes 30% of your production time!
- While using all your valuable production time for changing the ink formulation you don't compensate for the dot gain changes due to the change in ink film thickness → Lowering ink transfer results in printing smaller dots!

It is a must to have consistent ink transfer at All Time!



What is EFIO Comparing EFIo extended cell and Hexagonal cell shape







Measuring EFIo line count

- The length of the horizontal line in the image is: 0.01136 inch
- The number of cells included: 5
- The calculation for LPI: 5/0.01136 = 440 LPI
- The vertical line has a length of: 0.01363 inch and includes 3 cells it result in ≈ 220 LPI



What is EFIO Comparing EFIo extended cell and Hexagonal cell shape



Same number of cells per area



 Images top left and bottom left same line count

Objective Pamarco

- The Objective is to compare EFIo extended cell to conventional Hexagonal cell shape in terms of:
 - Ink transfer
 - Colour consistency
 - Smallest printed dot
 - Bar width gain
 - Moiré
 - Cell cleanliness over time



Test Setup Comparing EFIo extended cell versus Hexagonal cell shape

- 2 Screen Rolls with each 14 bands of which on both side 2 bands have identical specification for reference
- 3 substrates (Coated, Uncoated and Brown Kraft)
- 1 ink
- 2 production speeds (9,000 and 4,500 sheets/hour)
- Data collected for evaluation:
 - 7,600 spectral readings
 - 1,600 barcode scans
 - 540 microscope images
 - 84 image scans



Results comparable testing

- EFIo normal line count transfers more ink than Hexagonal with the same line count and same ink film thickness on the surface of the screen roll
- EFIo with same cell volume as hexagonal (same number of cells per area) transfers similar amount of ink
- Higher speed results in lower ink transfer
- Increasing screen roll line count and keeping IFT at same level results in deeper cells → This will lower ink transfer from cells → More ink is left in deeper cells which might result in faster clogging of cells
- Reduction of ink transfer results in:
 - Lighter colour: Can be adjusted by changing ink formula
 - Lower dot gain: Adjusting means new print plates

EFIo allows using a higher line count specification while not reducing ink transfer! (there are less cells/area on the surface of the roll in that case)



Comparable Testing L value versus IFT (Ink Film Thickness) The L value of the Lab colour system can be used as a measure for ink transfer



Comparable Testing

Dot size versus IFT IFT 8μm (T03B, Coated)





Comparable Testing

Dot size versus IFT Test T03B, IFT 8μm, coverage 15% Dot size on plate 78 μm

EFIo standerd 355 LPI Hexagonal 355 LPI EFlo high 560 LPI







Benefits EFIo

- Higher ink transfer at same line count specification compared to hexagonal cell shape if the number of cells per area is disregarded
- The need for cleaning and maintenance still needs to be tested in more detail but it is likely to be less for EFIo



The Solution

- Use a proven cleanable screen roll configuration → EFIo is the alternative
- Use 3 screen roll specifications:
 - Uncoated paper: IFT 6.5-7.7 BCM/inch², 254 LPI (EFIo 406 LPI)
 - Coated paper: IFT 2.6-3.2 BCM/inch², <508 LPI (EFIo 812 LPI)
 - Process colours on coated liner: IFT 1.9 BCM/inch², <812 LPI (EFIo 1295 LPI)
- Measure screen roll IFT before inking up the machine. Clean screen rolls if screen roll IFT value is too low
- Regularly clean screen rolls

Changing screen rolls to 3 specifications will not result in a need for new print plates! The current common used high line count rolls results in a larger variation on dot gain then using EFIo.



Thank you for your attention

More detailed information about EFlo screen rolls and the test results can be obtained at Pamarco, stand 111



