

KODAK FLEXCEL SOLUTIONS

Brought to life by Miraclon

Enabling Conversion From
Gravure To Flexo Process Printing
For Thin Films & Higher Productivity
Benefits!

Hrishikesh Kulkarni
May 2019

Objectives of print

- Photo realistic images
- Solid rich colors
- Clean bright highlights
- Clean legible text
-at the lowest production cost (efficiency)



Historically....

Flexible
packaging



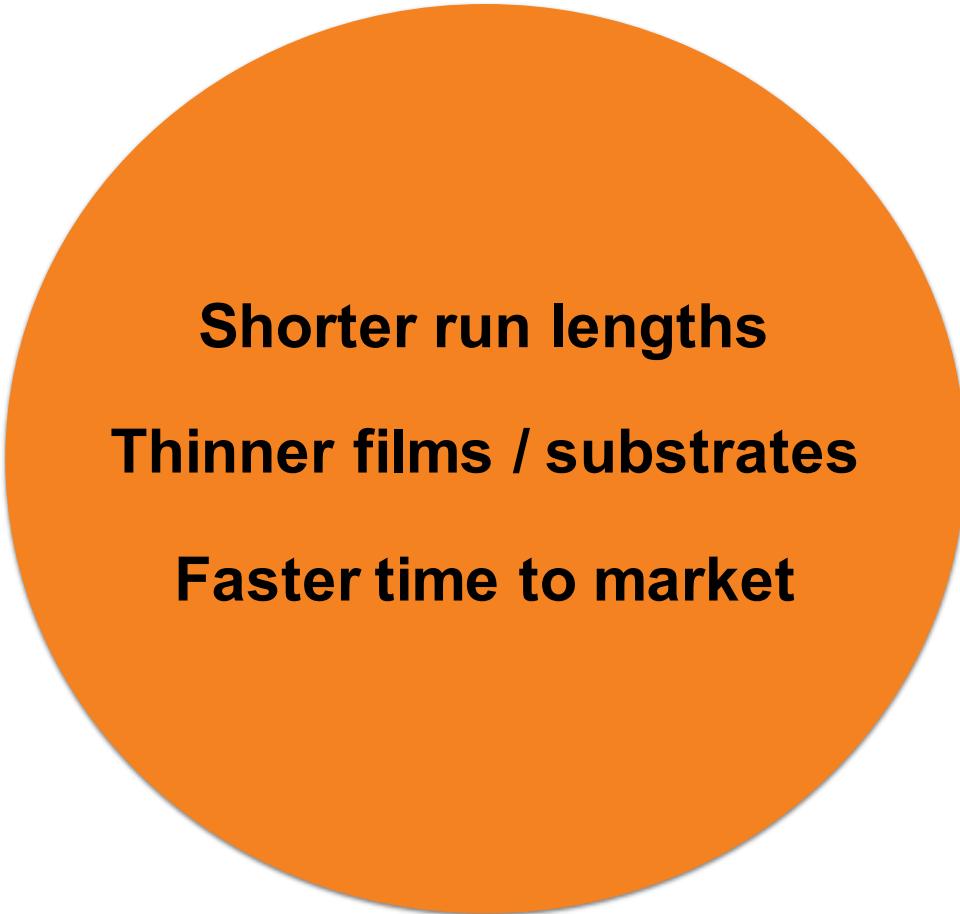
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Gravure

Excellent quality

Brand confidence

Market trends now demand...



Shorter run lengths

Thinner films / substrates

Faster time to market

A challenge for gravure



No compromise in image quality

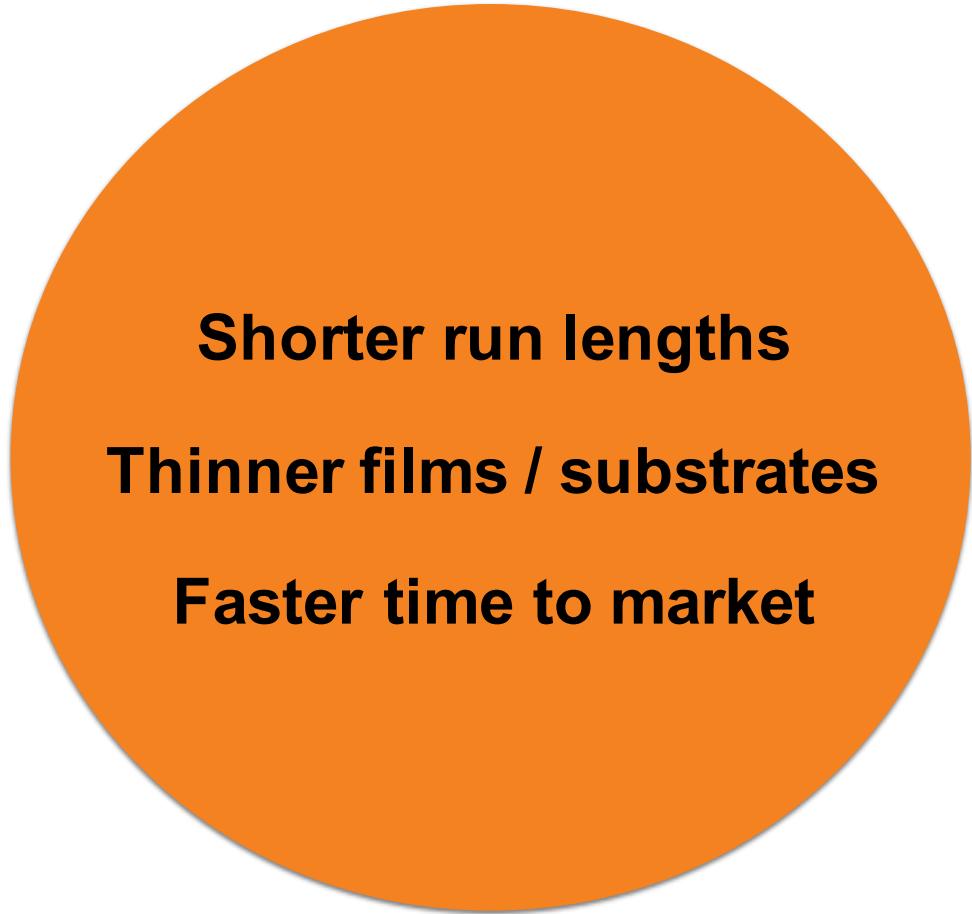
No compromise in appearance

No compromise in consistency

A challenge for flexo

Why thinner film substrates

- Brands are constantly looking at "lightweighting" products
 - Print substrate is only an "image carrier"
 - Laminate provides product protection
- Sustainability is a major talking point



Shorter run lengths

Thinner films / substrates

Faster time to market

“The growing demand for more environmentally responsible materials and better recycling will drive demand for thinner, lighter materials and, less waste combined with faster turnaround times, flexibility and optimized costs.”

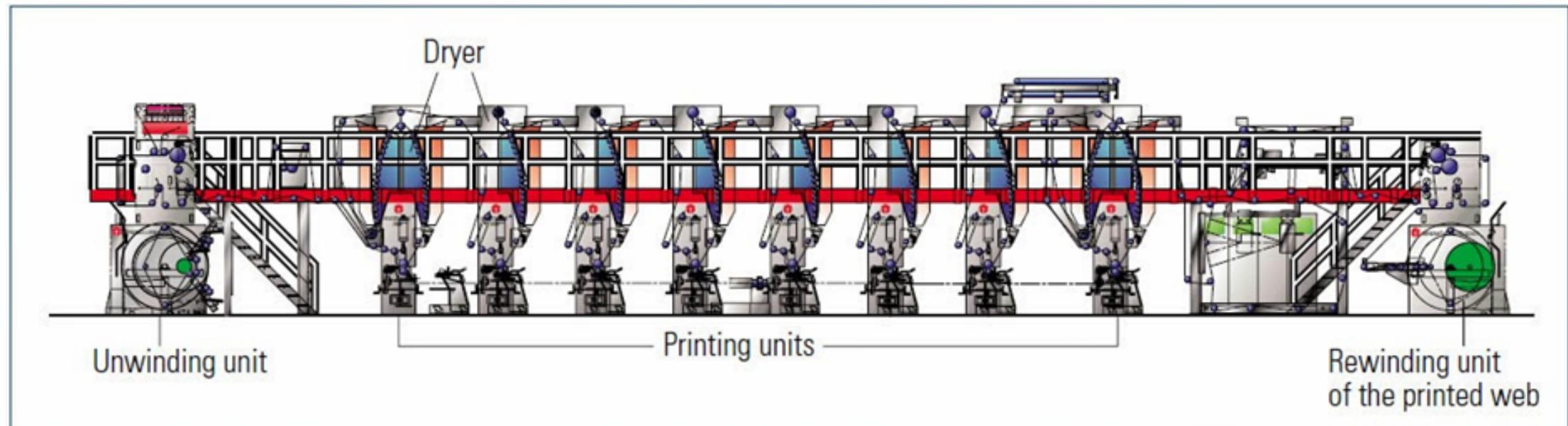
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“....we believe in responsible packaging, for example as lightweight as possible and with an end of life solution”

Roy Joseph, Vice President & General Manager Amcor India
(Jan 2019)

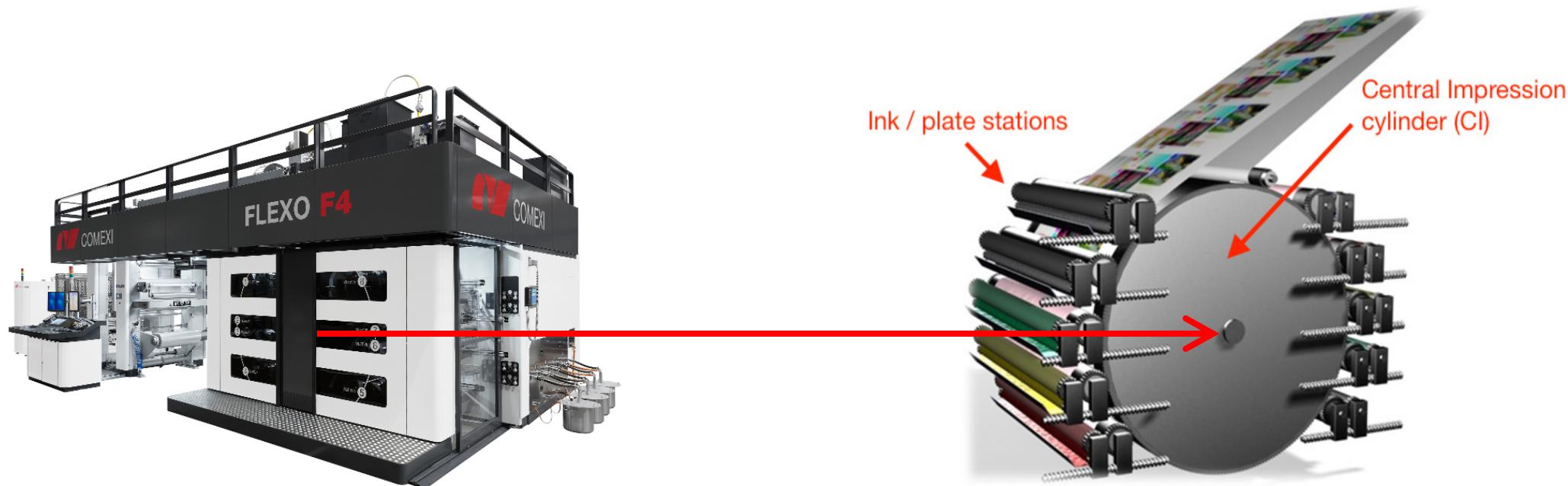
Gravure – works best on thicker substrates

- Individual printing decks
 - Substrate is pulled through each deck and up through the dryer
 - Thin substrates will stretch and move due to heat (drying) between decks causing registration issues



Flexo is more suited for thin substrates

- Central Impression (CI) Press
 - Substrate held in position on CI cylinder as colours are printed onto substrate
 - *no stretch*
 - *accurate registration*



Market demands

This used to be a challenge for flexo



No compromise in image quality

No compromise in appearance

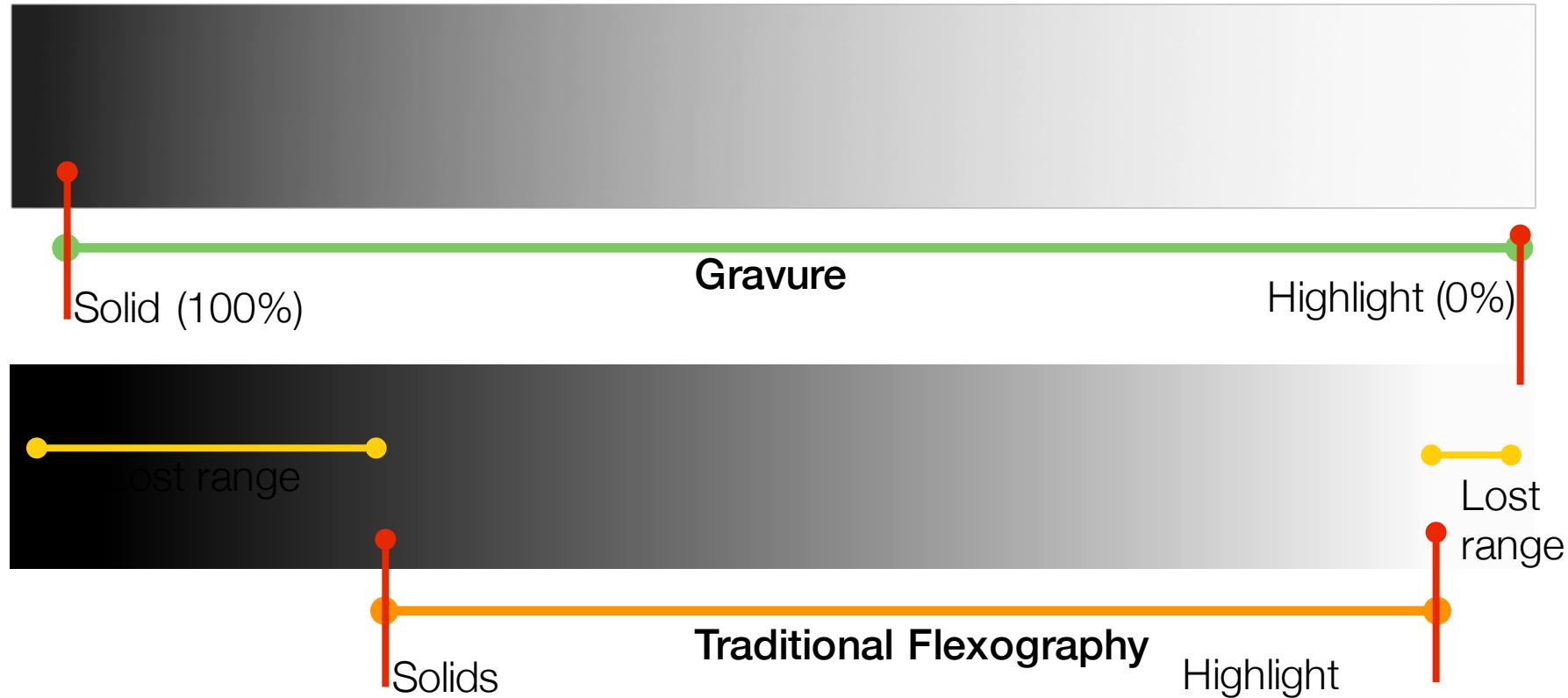
No compromise in consistency

Eliminating the compromises

- Requirement to fade tones to 0%
 - Whites to be (Visual) whites
 - No design limitations due to any printing limitations
- Solid colours to be solid
 - No pinholes
 - High densities
 - Vibrant colours

Tonal range

Gravure printing can maintain a greater tonal range over traditional flexography



Gravure quality – whites are white

Clean Whites and Clean Colors



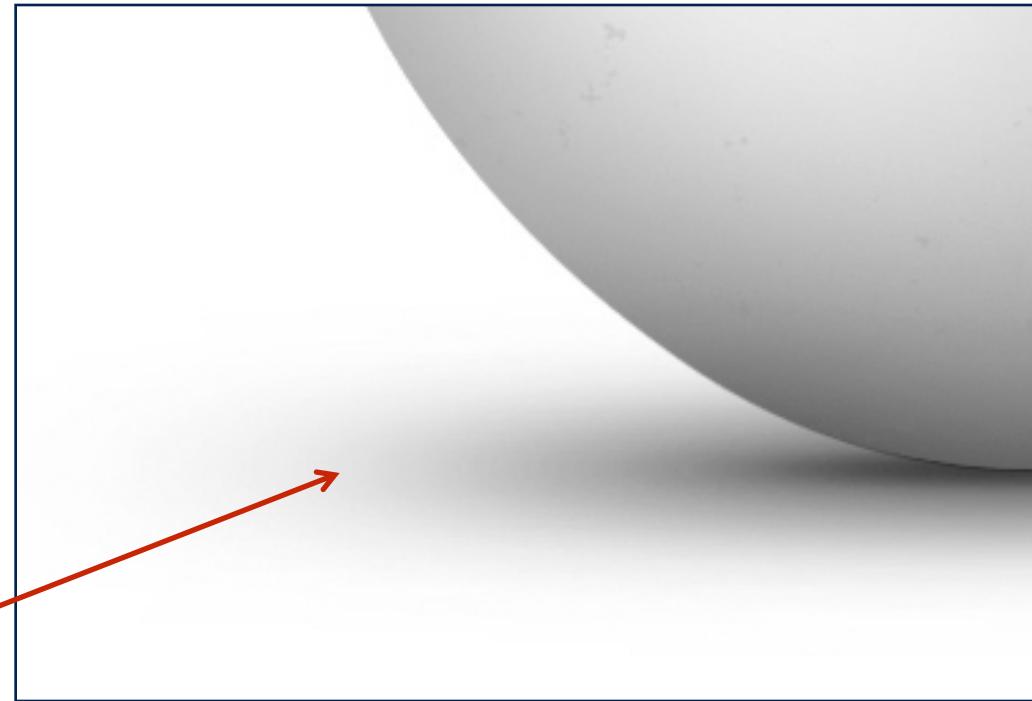
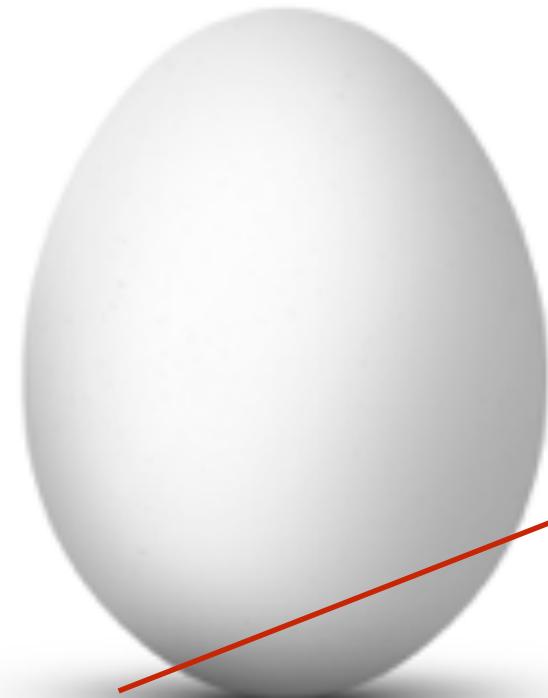
Gravure fading to substrate white



Traditional Flexography with 2% minimum dot

Fading to 0% is difficult with traditional flexo

It's normal in Gravure!



Soft shadow – Traditional Flexo

- Shadow “shortened” and minimum dot 2%
- No match for Gravure

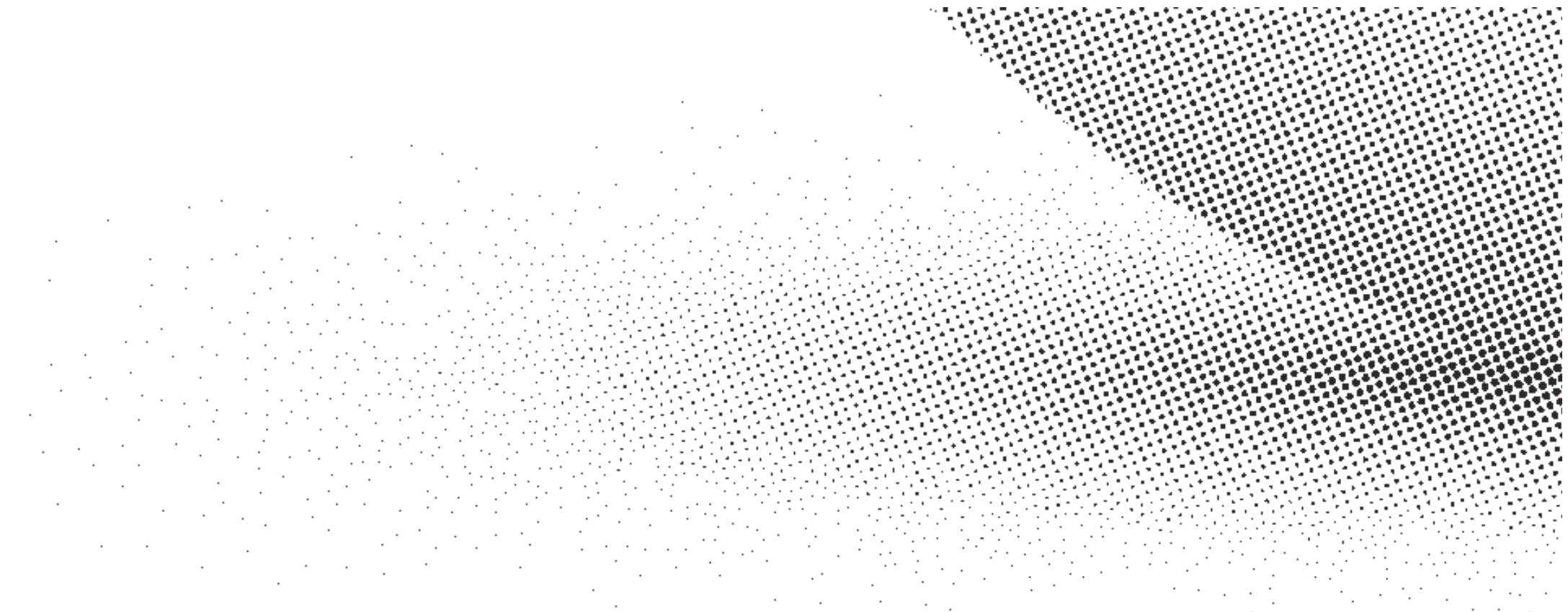




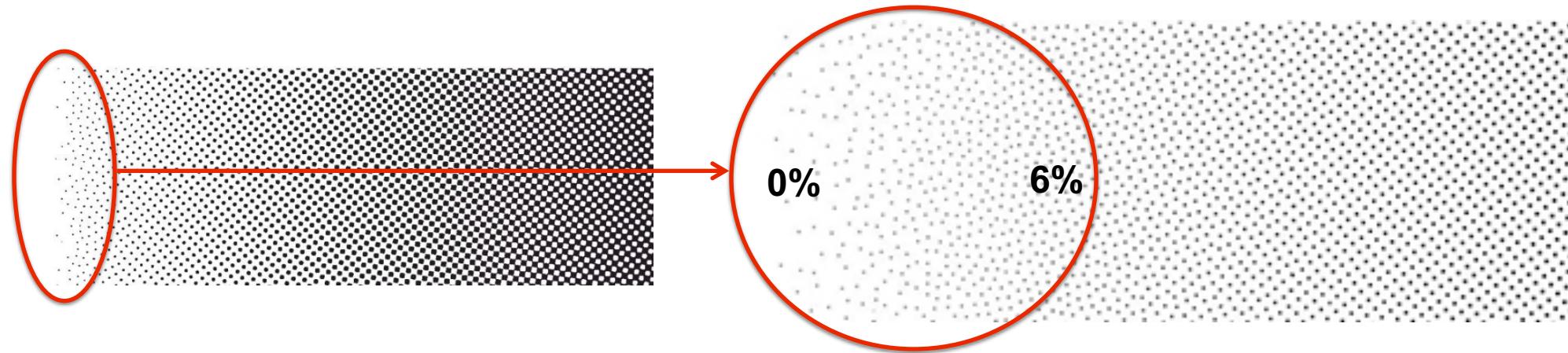
How to make, hold and print a 21 micron isolated dot in Flexo

Soft shadow – Kodak Maxtone SX

- Visual effect of fading to 0% with random 21 micron dots only up to approx. 6%



Maxtone Sx and Hyperflex

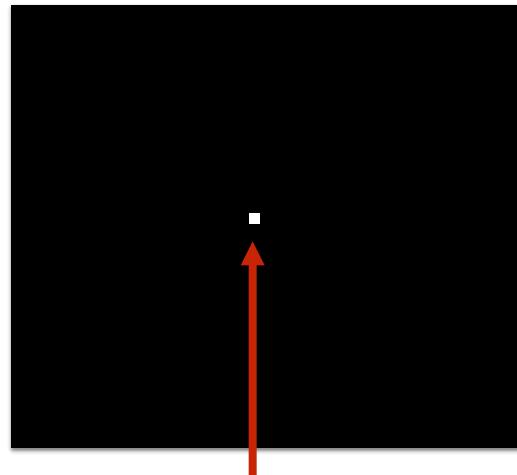


Visual effect of fading to 0% with random 21 micron dots only up to approx. 6%

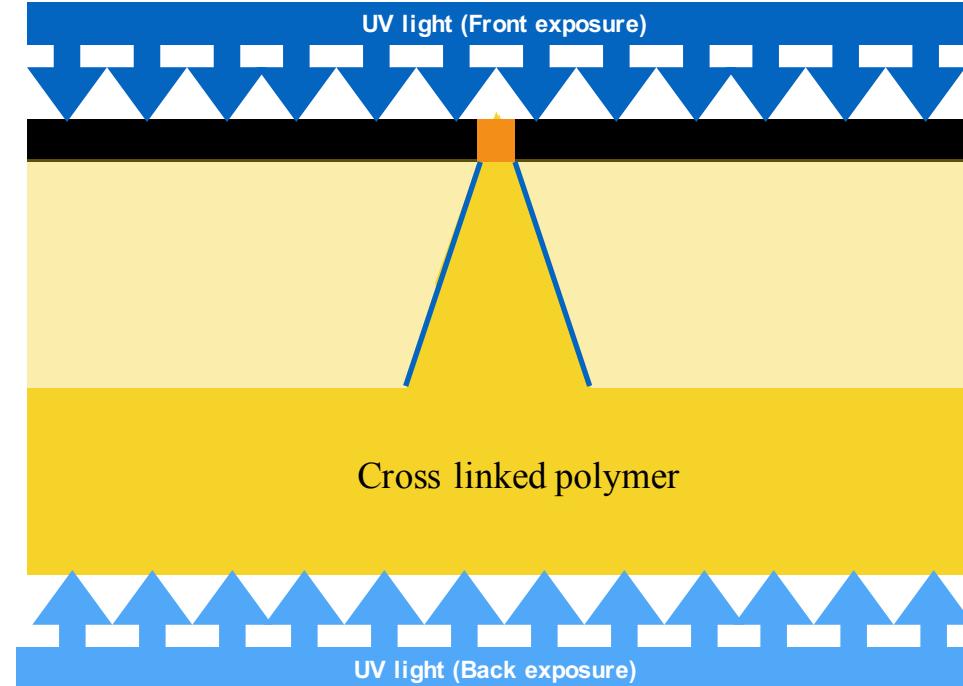
- Maxtone is a screening which applies stochastic (FM) screening only in the areas between 0% and 6%, transitioning into a “normal” AM screen from 6%
- Minimum size dot 21um (2x2)
- In Hyperfelx, fine highlight dots are supported, only where needed
- Ultra high resolution imaging allows:
 - *Accurately places 5 x 10 micron light valves ONLY around isolated dots of 6% and less*
 - *Raises floor of plate to provide stability to the dot ONLY on these areas*

Normal highlight on a flexo plate

- UV exposure from front creates dot by cross-linking the polymer (hardening)
 - Back exposure raises floor, all over
 - Isolated dots are unstable and will wear off

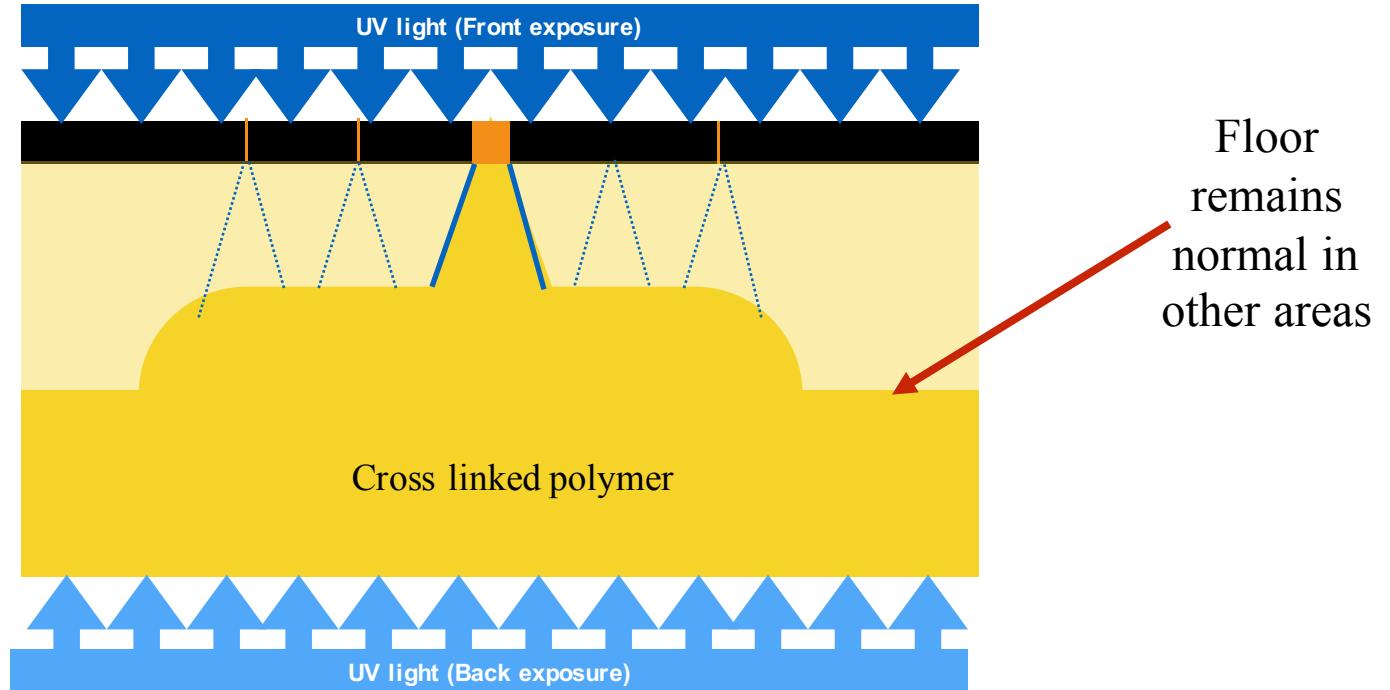
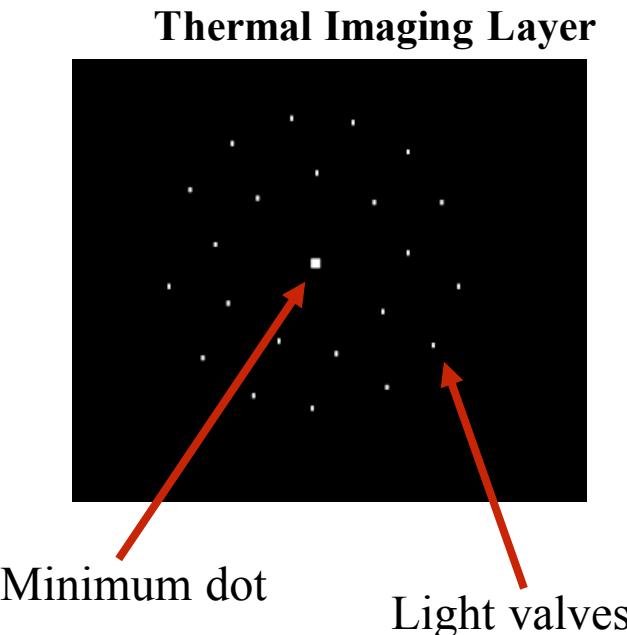


Minimum dot on Thermal Imaging Layer (TIL)

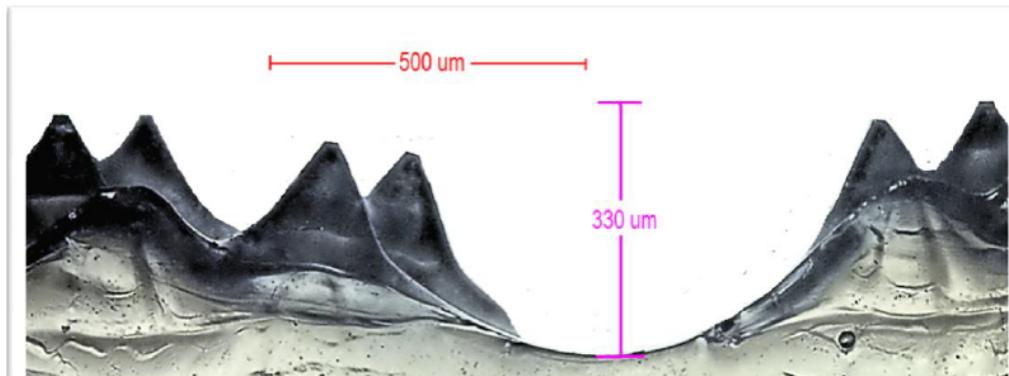


Hyperflex on Kodak Flexcel NX plates

- Light valves are created around EACH isolated dot between 0% and 6%
 - 5 x 10 micron in size
 - These allow UV light to pass through TIL and not form a dot, but raise floor of the plate

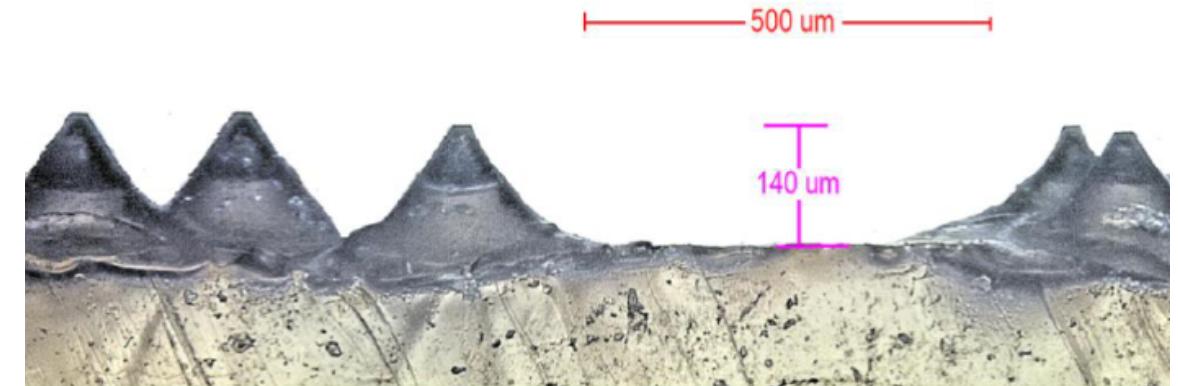


Raising floor of plate to provide stability to the dot



Normal plate

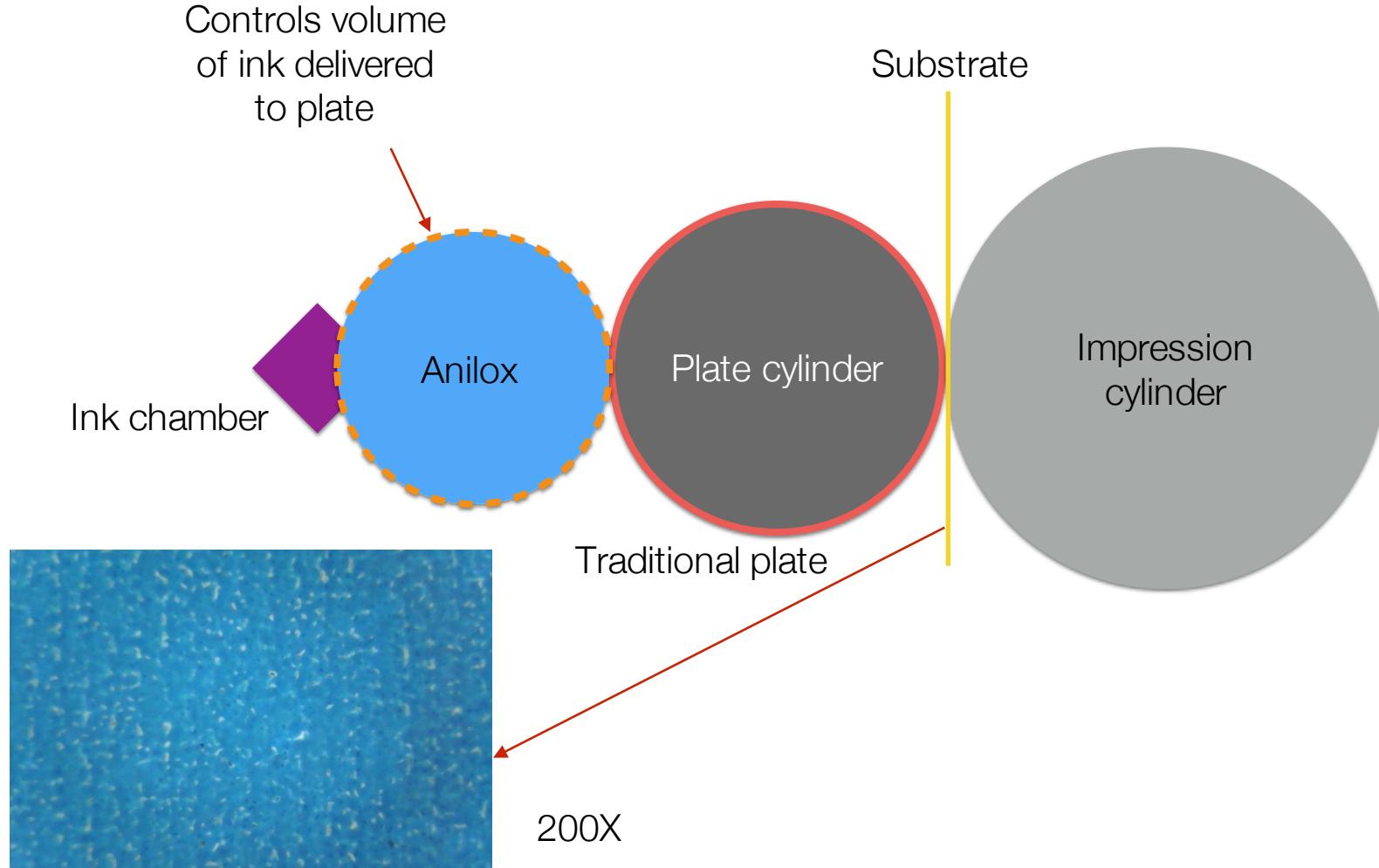
Looking at the plate side on



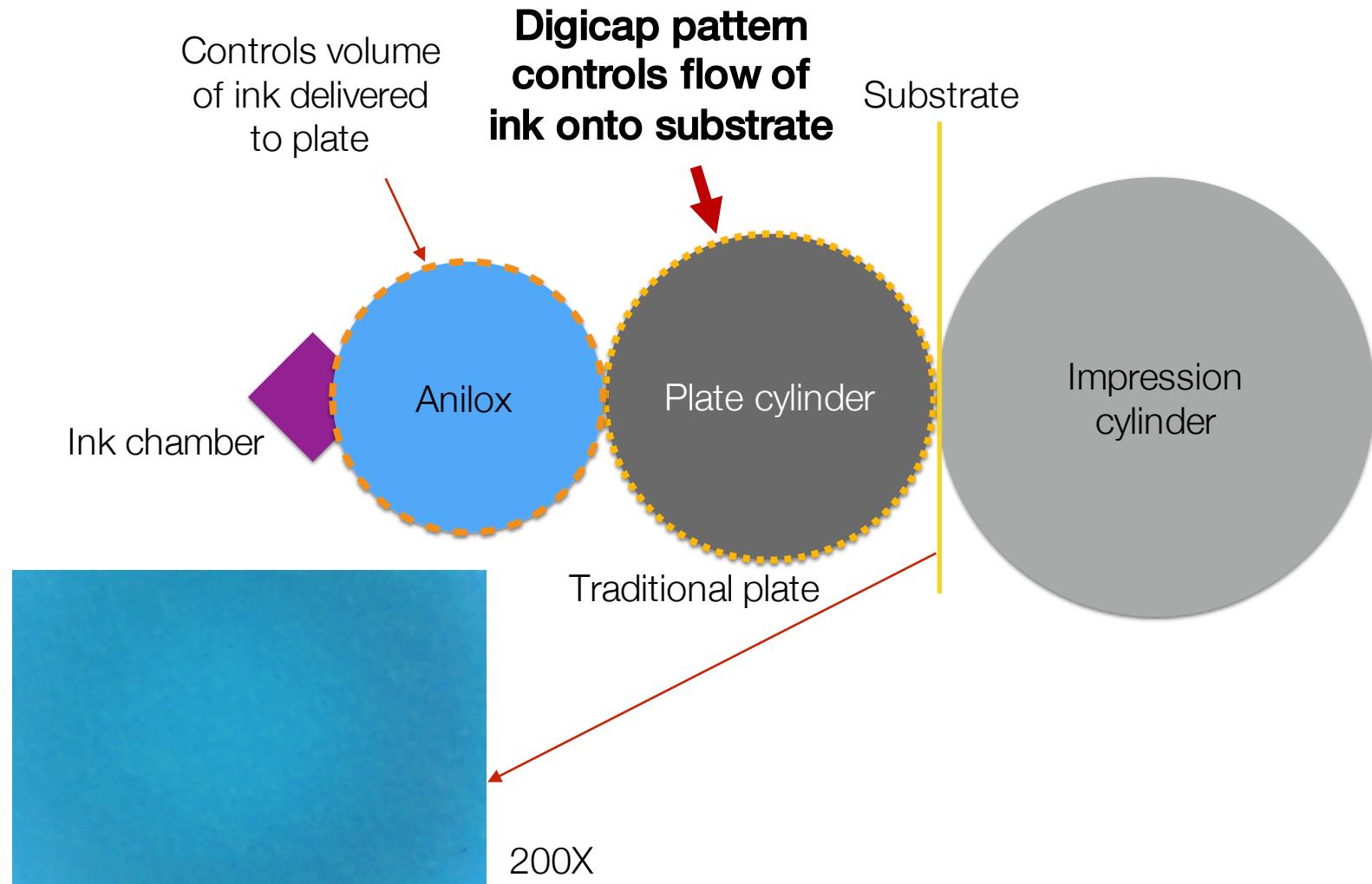
Kodak NX with Hyperflex

Solids without pinholes and high densities,
with full tonal range

Flexo process with traditional plate

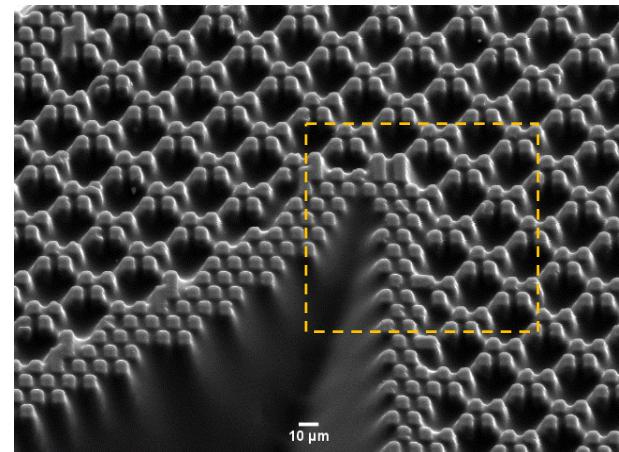
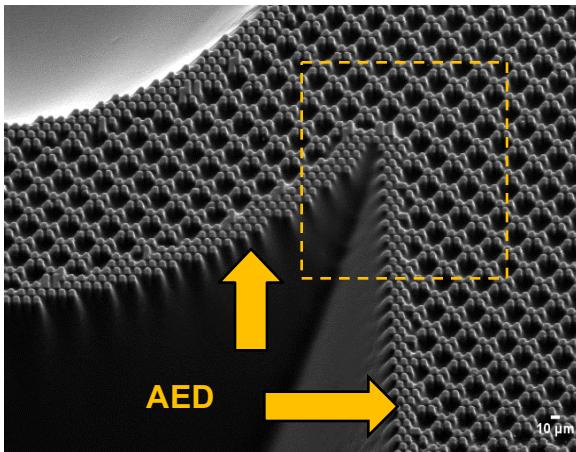
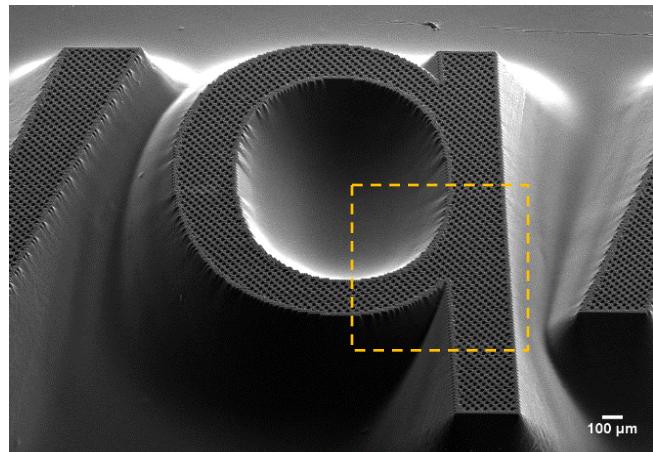
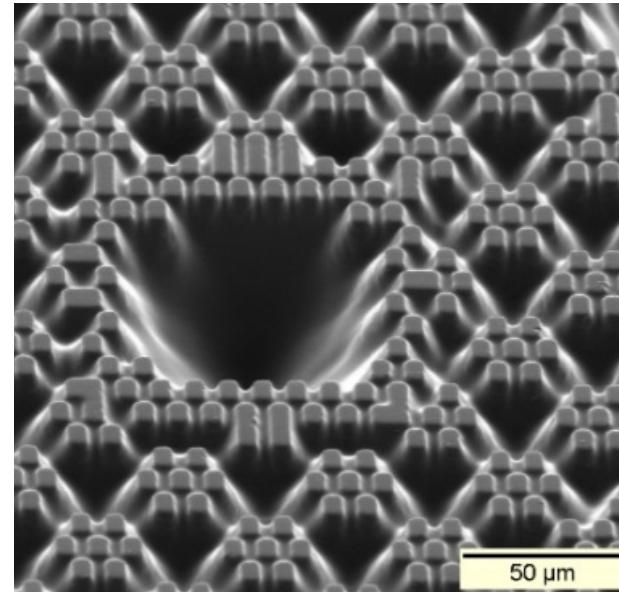


Flexo process with Kodak Flexcel plate



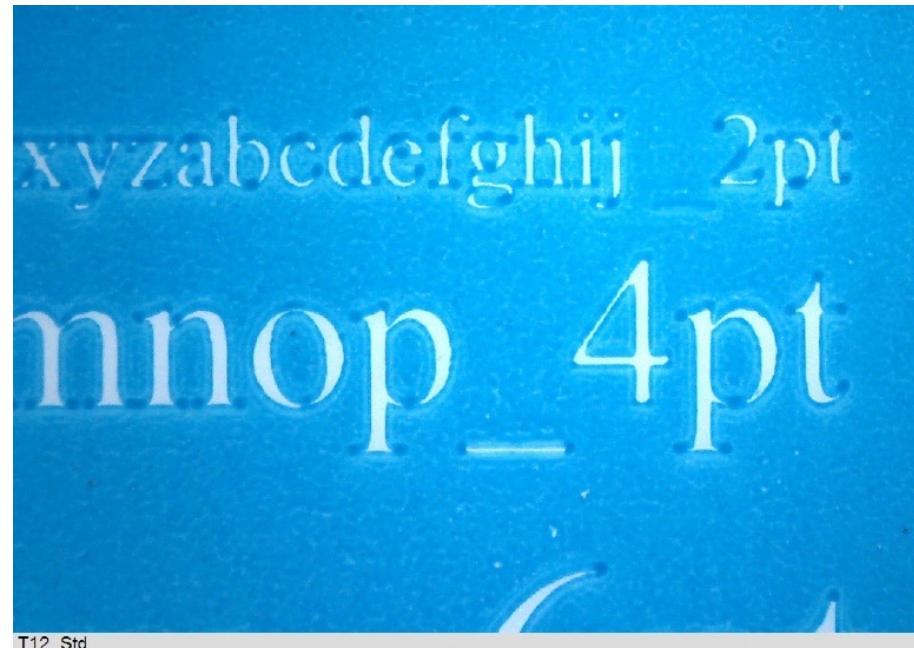
Achieving a full shadow tonal range

- Kodak Advanced Edge Definition (AED)
 - Keeps tones open, all the way up to 99%
 - Improves Contrast and tonal range
 - Reverse and positive text benefit

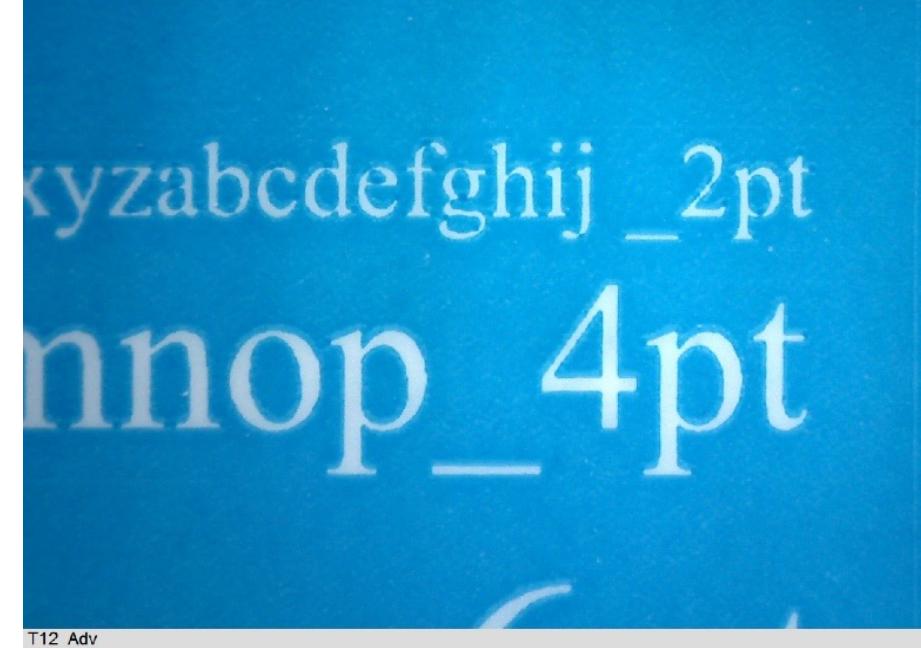


Advanced Edge Definition (AED)

- Reverse text is improved, shadow tones are kept open up to 99%
 - Recommended minimum reverse text size **without** Kodak AED is 6 pt
 - With AED it becomes **4pt** - very important with **increased copy** required on packs



Without AED



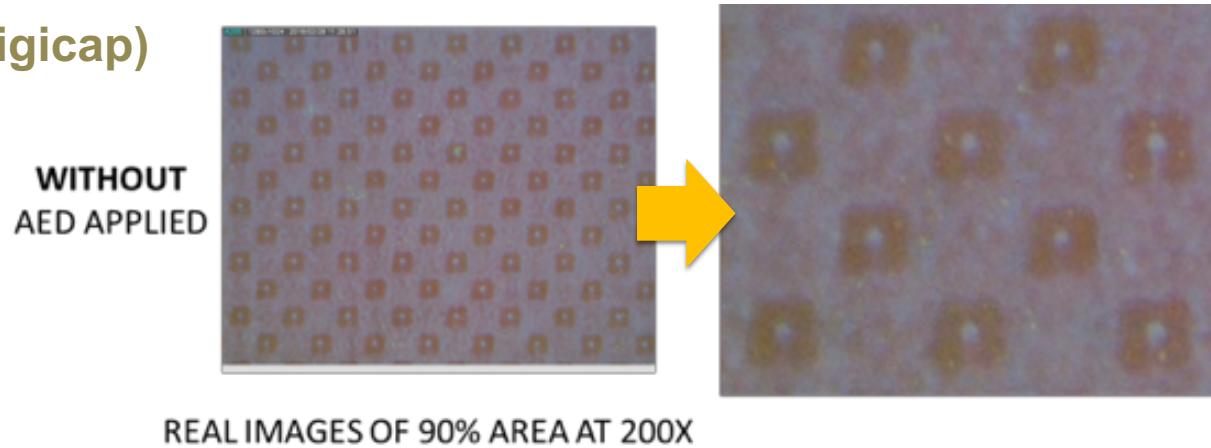
With AED

Advanced edge definition (AED)

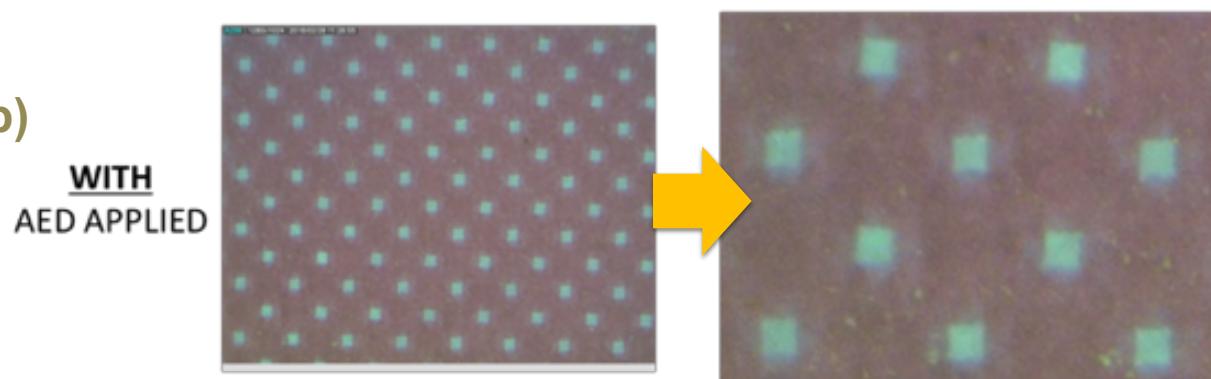
Halftones keep more open in shadow end

- Provides greater print contrast and tonal range

(Standard Digicap)

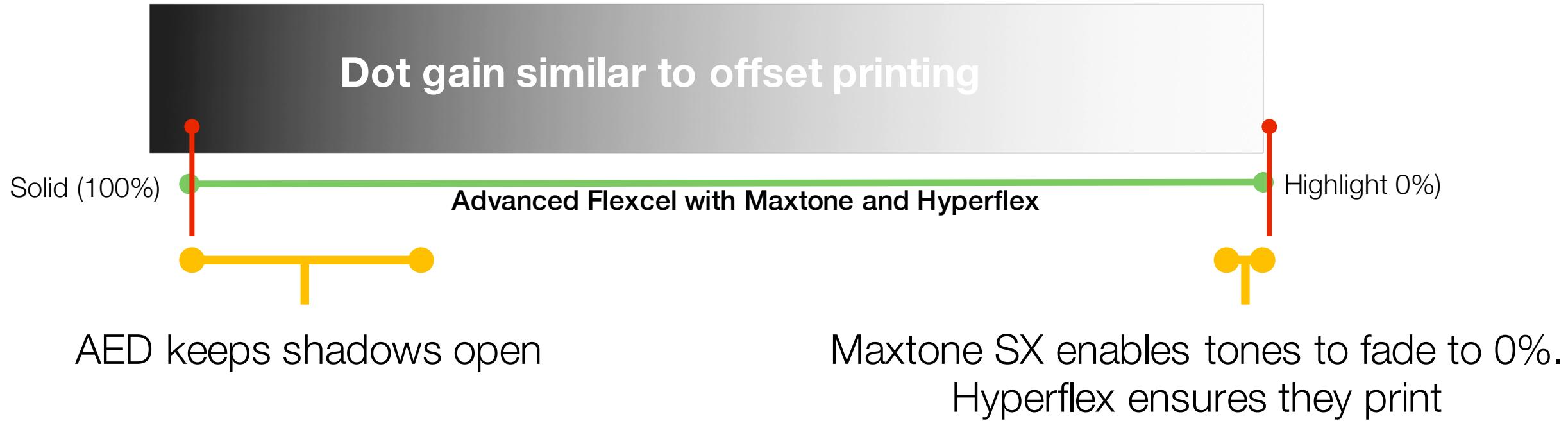


(A01 Digicap)



Quality parity with Gravure

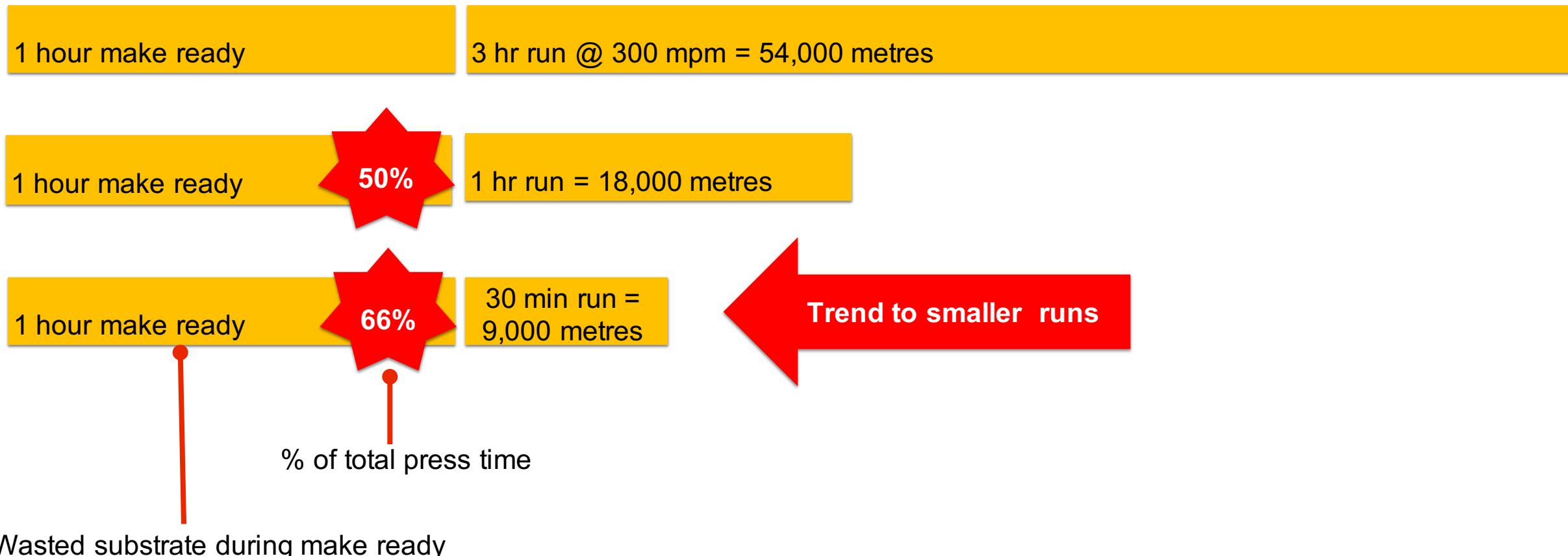
- Advanced Flexcel combined with Maxtone SX screening and Hyperflex eliminated need for minimum dots, reproducing same tonal range as Gravure



Productivity Approach

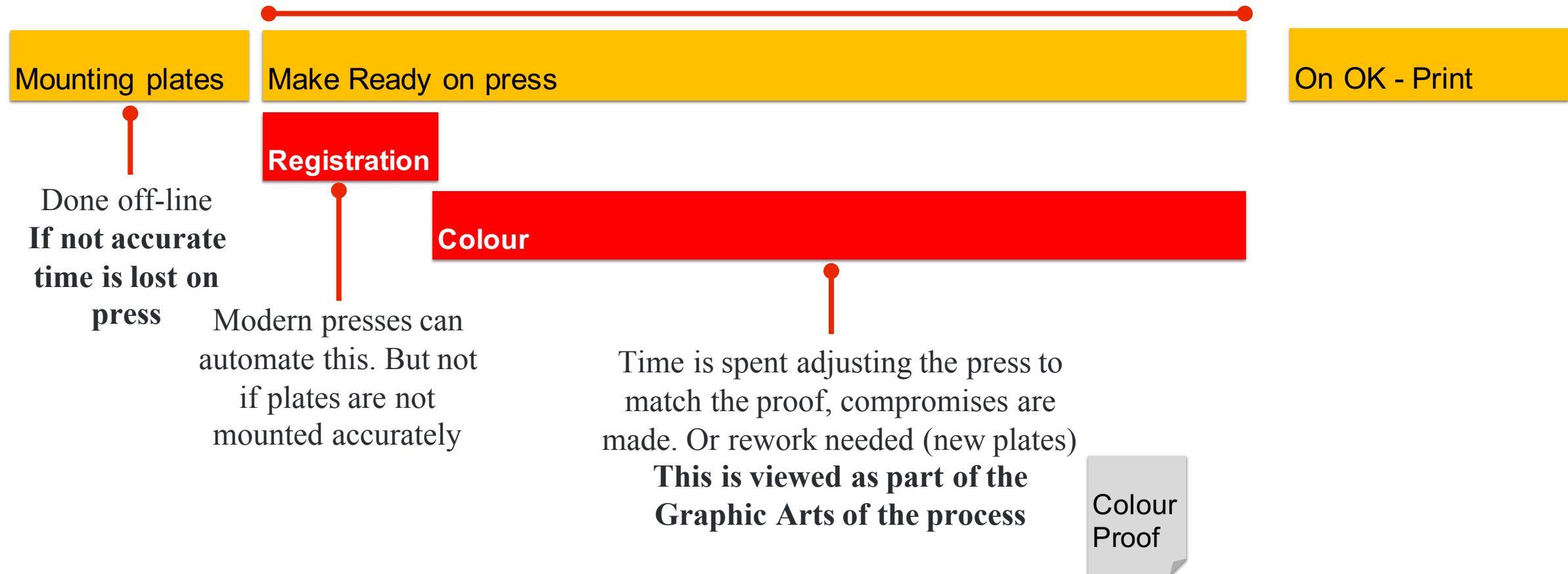
Make-ready is non-chargeable press time

Make-ready time is critical in short-run work



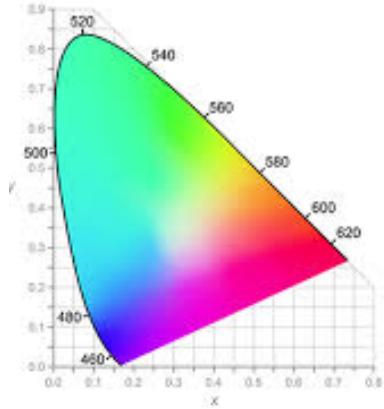
Typical make-ready

Target is the proof supplied...



Graphic Art...to Graphic Science

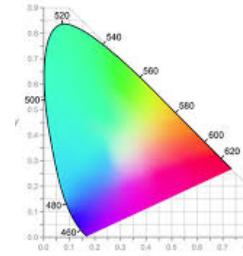
- Everything within Flexo today is repeatable and highly predictable
 - Reprographics
 - Plates
 - Anilox
 - Ink
 - Press Environment (with modern presses)
- Litho has been “printing to numbers” for over 20 years
 - Flexo can too

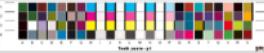


Graphic Science

- Press is profiled at optimum print condition
 - Modern colour management tools keep Substrate (colour) Dot Gain and colour space separate
- Proof is produced with the above print condition
 - Proof matches print - **providing targets are maintained and met**
- **Modifications to colour are made on proof, before plates and printing...**
- **The proof becomes the focus**
 - Time spent with proofing is much less cost than a press

Supplied proofs



- Most Brands will generate a **calibrated** proof (39L) or at least know what colourspace the proof is 
 - The designer has to set Marketing's colour expectation at this point!
- Unless your press is set up to print to the standard.... which most are not
 - Your print result will not match the proof!
 - Often Pre-Press will adjust certain colours based on knowledge
- Higher productivity on press can only be achieved when you eliminate the guesswork!

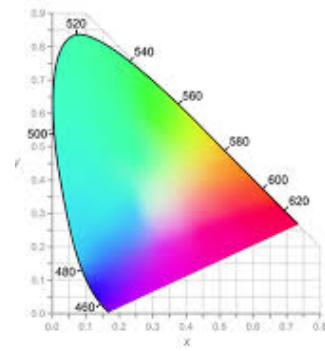


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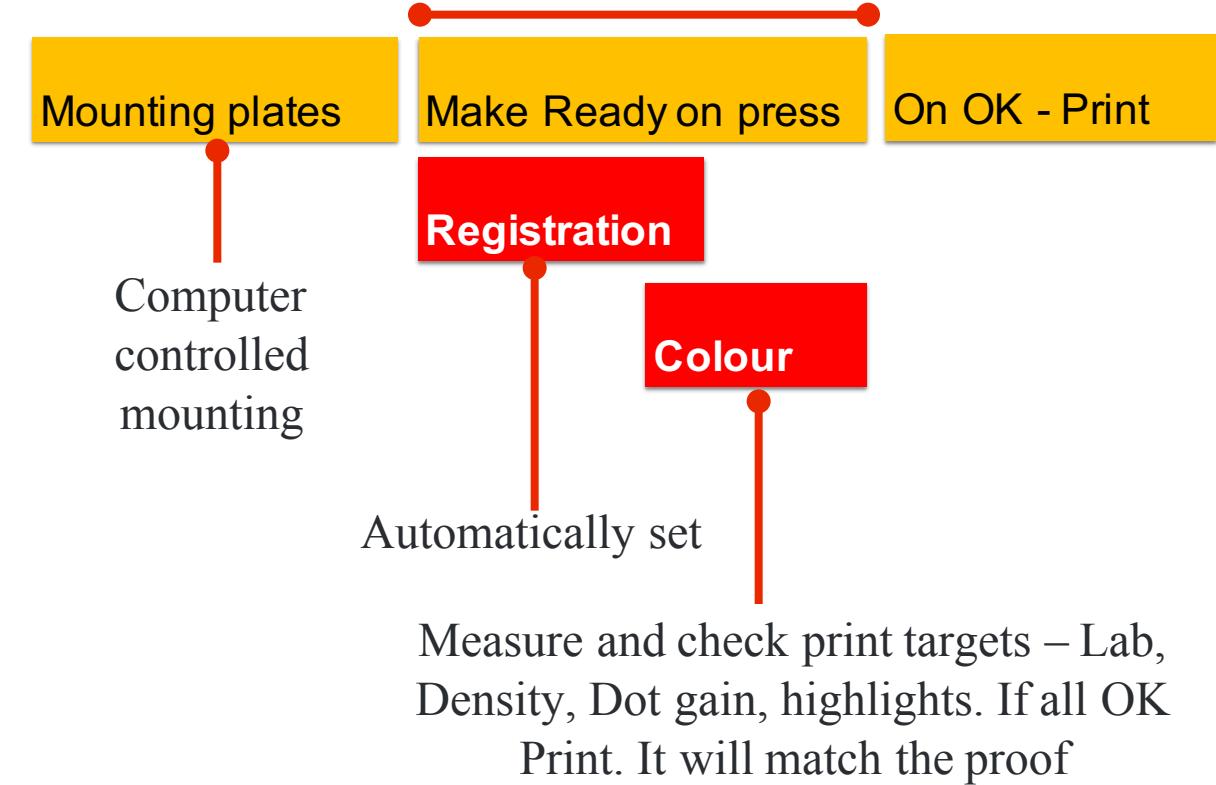
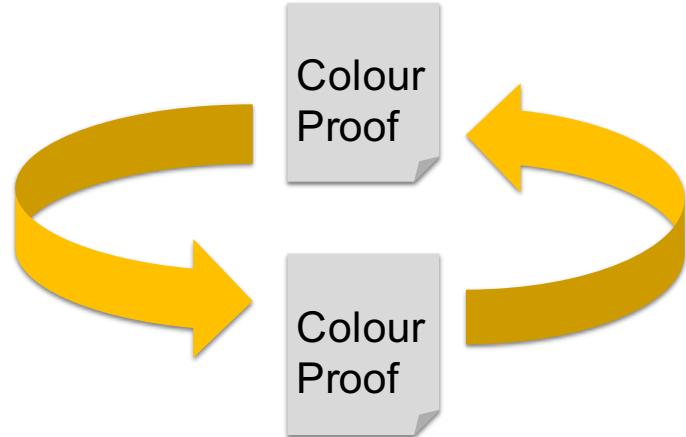
Waste in time and materials

- Every minute making ready uses substrate (waste) and press time
 - This also limits how many jobs you can run in a day = productivity
- The "low hanging fruit" in productivity improvement is in make-ready
 - The press should not be used to proof
- Know and control your press conditions by profiling your press
 - Without this you are wasting time and money!
- If you know the originating proof's colourspace and you know your print colourspace
 - There are solutions available to automatically convert the originating file into the print colourspace to match the originating proof!



Predictable make-ready improves productivity

- Target is the **calibrated** proof supplied...
- Adjustments are made at the proof stage **BEFORE** print
 - With the knowledge the proof is how the job will print



Summary

- To produce the highest quality of flexographic printing to reach quality parity with Gravure requires a partnership approach between Brand Owner – Designer (Premedia) -Tradeshop and Printer
- Flexo can now achieve quality parity with Gravure
 - Comparison made at the supermarket shelf - not with magnifying glasses
 - Must be able to fade to 0% and no minimum dot restrictions
 - High density, smooth solids are mandatory
- It's the **visual impact** of the printed results that needs to be compared
- Take the art out of the process, dramatically improves productivity
 - Replace with science for colour management and predictability with proof to print match

This requires a new way of thinking...

The EIGHT words that are the most costly in business today

That's the way we have always done it

Thank You