



# Effect of Speed



- Reduction in solid density
  - Less ink applied to substrate
    - Inking of anilox in chamber?
    - Ink transfer from anilox to plate or from plate to substrate?
      - Film splitting?
  - Same trends for film and paper
- Effect of speed on tone gain
  - Different responses for film and paper substrates
    - OPP film – no trend
    - Paper – decrease in tone gain as speed increases



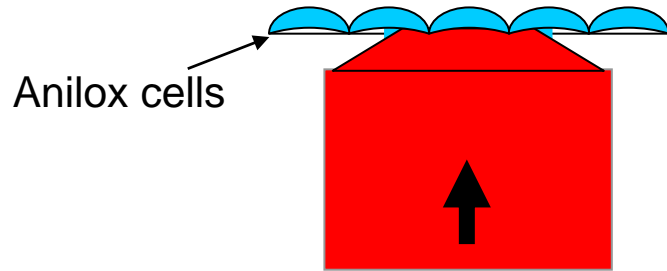
# Implications for Press Operation



- Press speed
  - Understanding effects is essential
  - Needs to be compensated during pre-press
- Changing impression pressure to compensate
  - Does not change ink split point
    - Can affect amount of ink absorbed into porous substrate
  - Affects tone gain, won't entirely compensate for press speed
    - Implications for Auto-impression systems

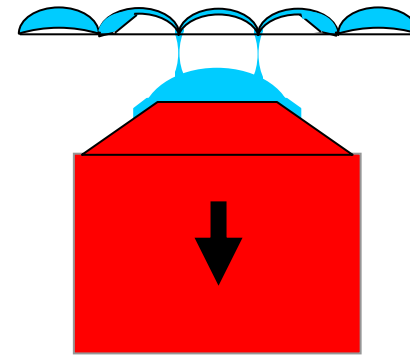


# Halftone Ink transfer

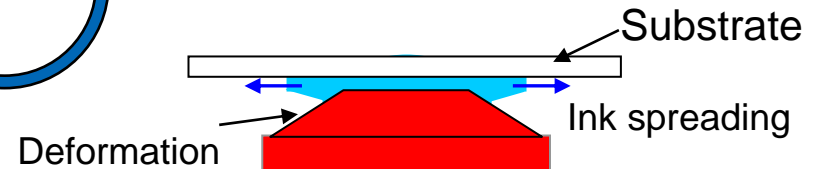
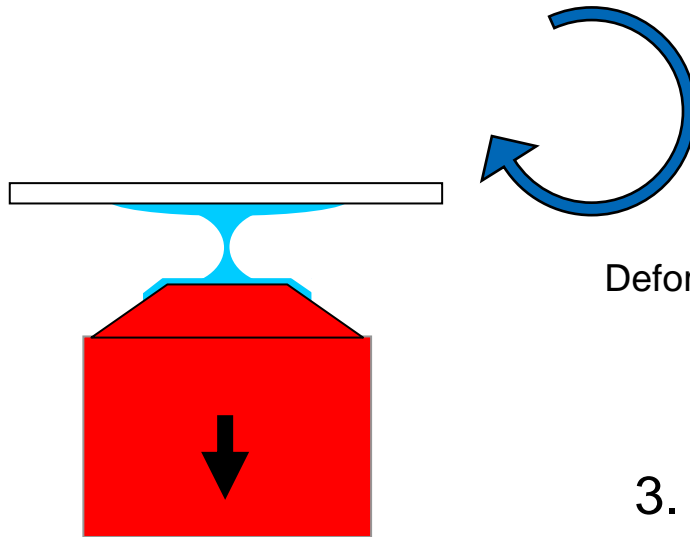


Anilox cells

1. Dot engaged with anilox cells



2. Ink pulled from cells



3. Dot engaged with substrate

4. Ink split between plate and substrate



# Ink release from anilox



- IGT F1 – Flexographic Mini press
- Controlled laboratory environment
- Variation in settings
  - Speed
  - Anilox pressure
  - Anilox inking
  - Print pressure
- Range of anilox rolls

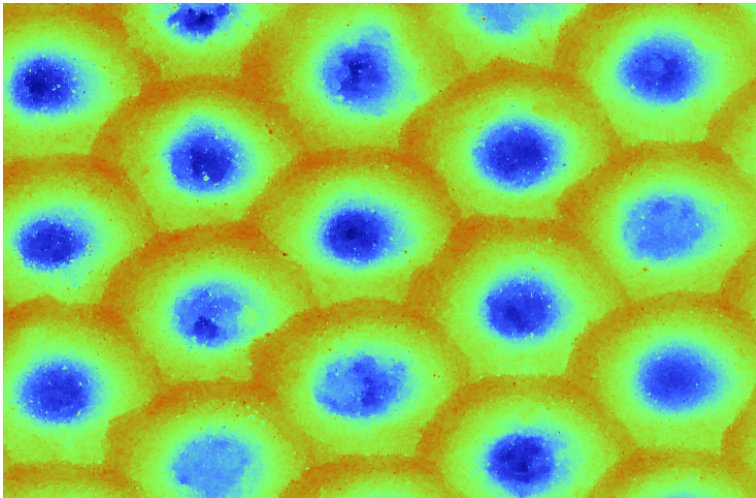




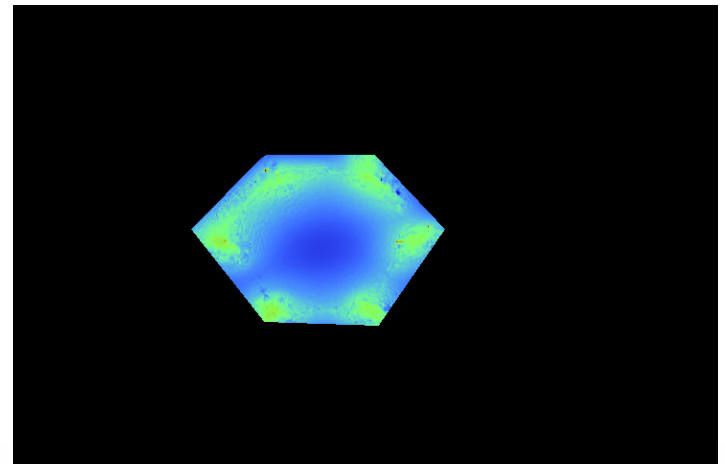
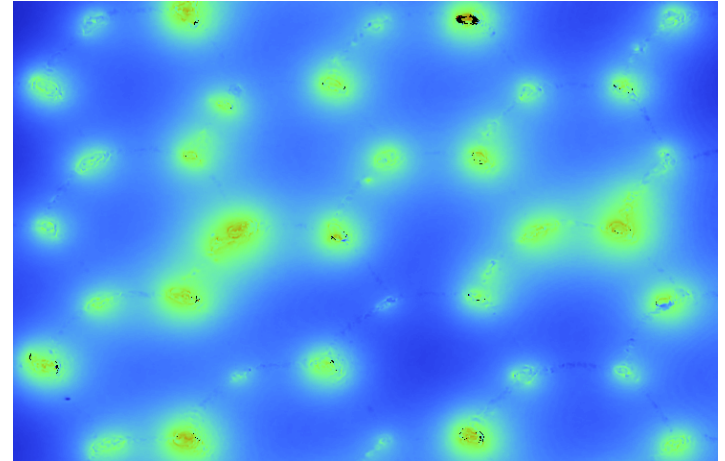
# Anilox Measurements



- White Light interferometry
- Single cell analysis



Un inked

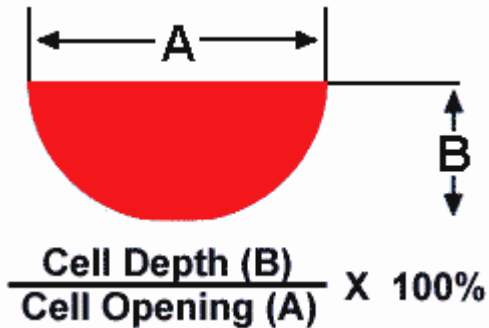


Inked



- Anilox 0 (402419)

- Volume  $23568\mu\text{m}^3$
- D-to-O = 43%
- Open area =  $0.00249\text{mm}^2$
- Depth =  $23.97\mu$
- Screen count 600lpi



- Anilox 1 (402409)

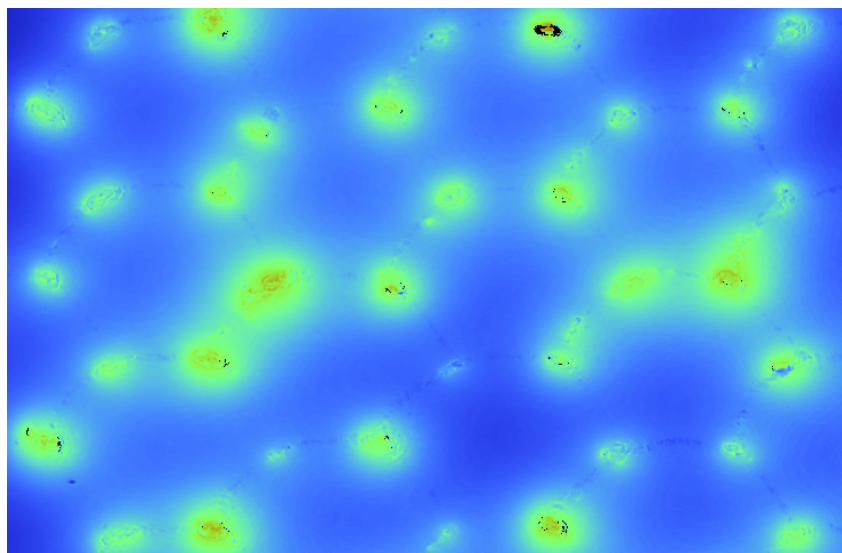
- Volume =  $32029.91\mu\text{m}^3$
- D-to-O = 35%
- Open area =  $0.0030\text{mm}^2$
- Depth =  $16.34\text{micon}$
- Screen count 350lpi

- Anilox 2 (402411)

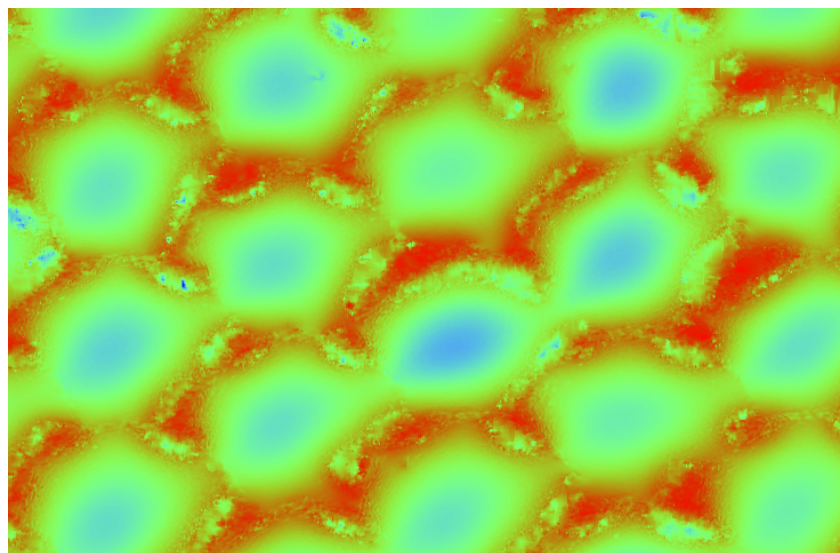
- Volume =  $58812.81\mu\text{m}^3$
- D-to-O = 36%
- Open area =  $0.0039\text{mm}^2$
- Depth =  $18.72\text{micron}$
- Screen count 300lpi



# Results: Solid Plate



Inked roll

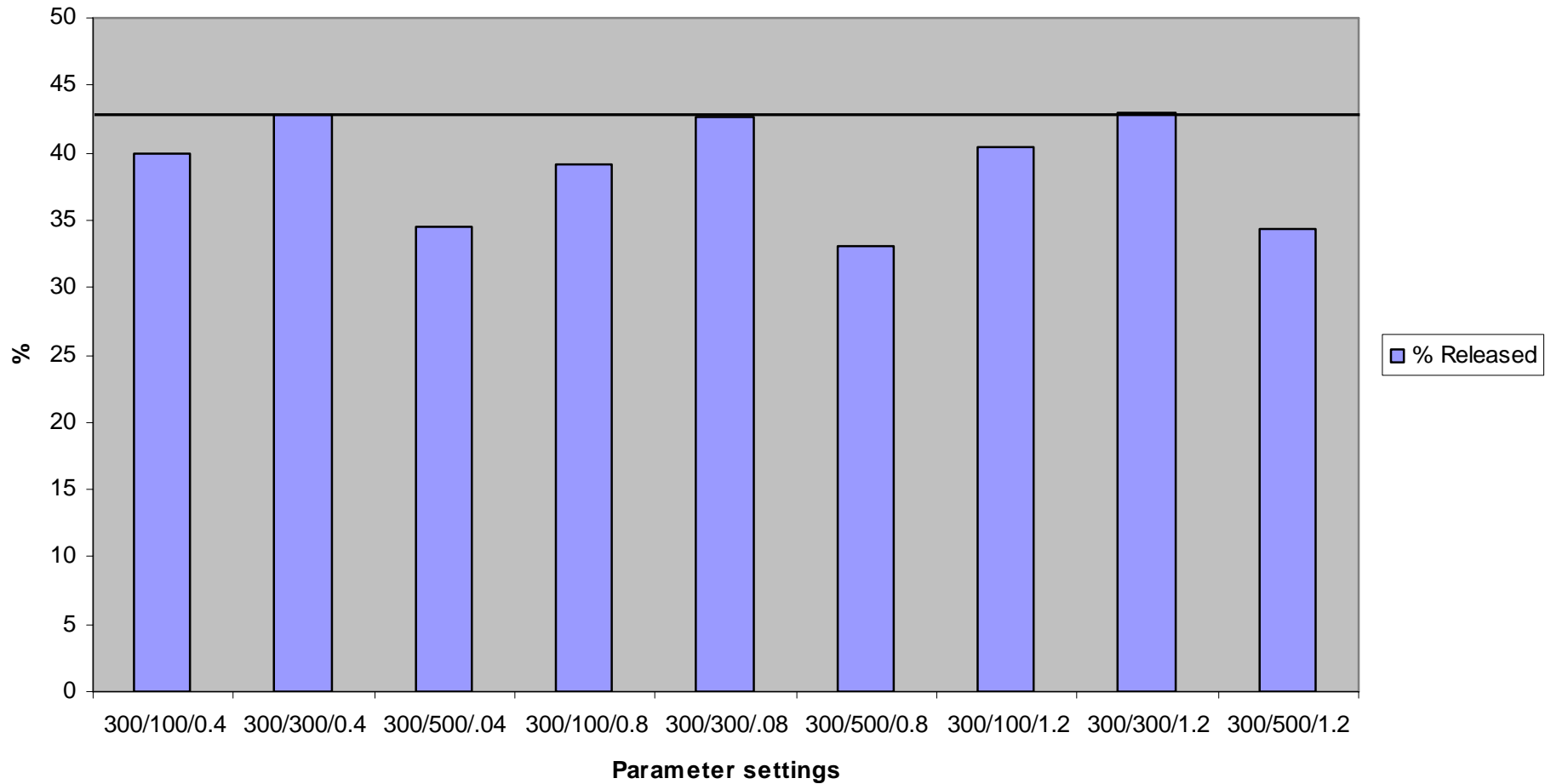


After printing





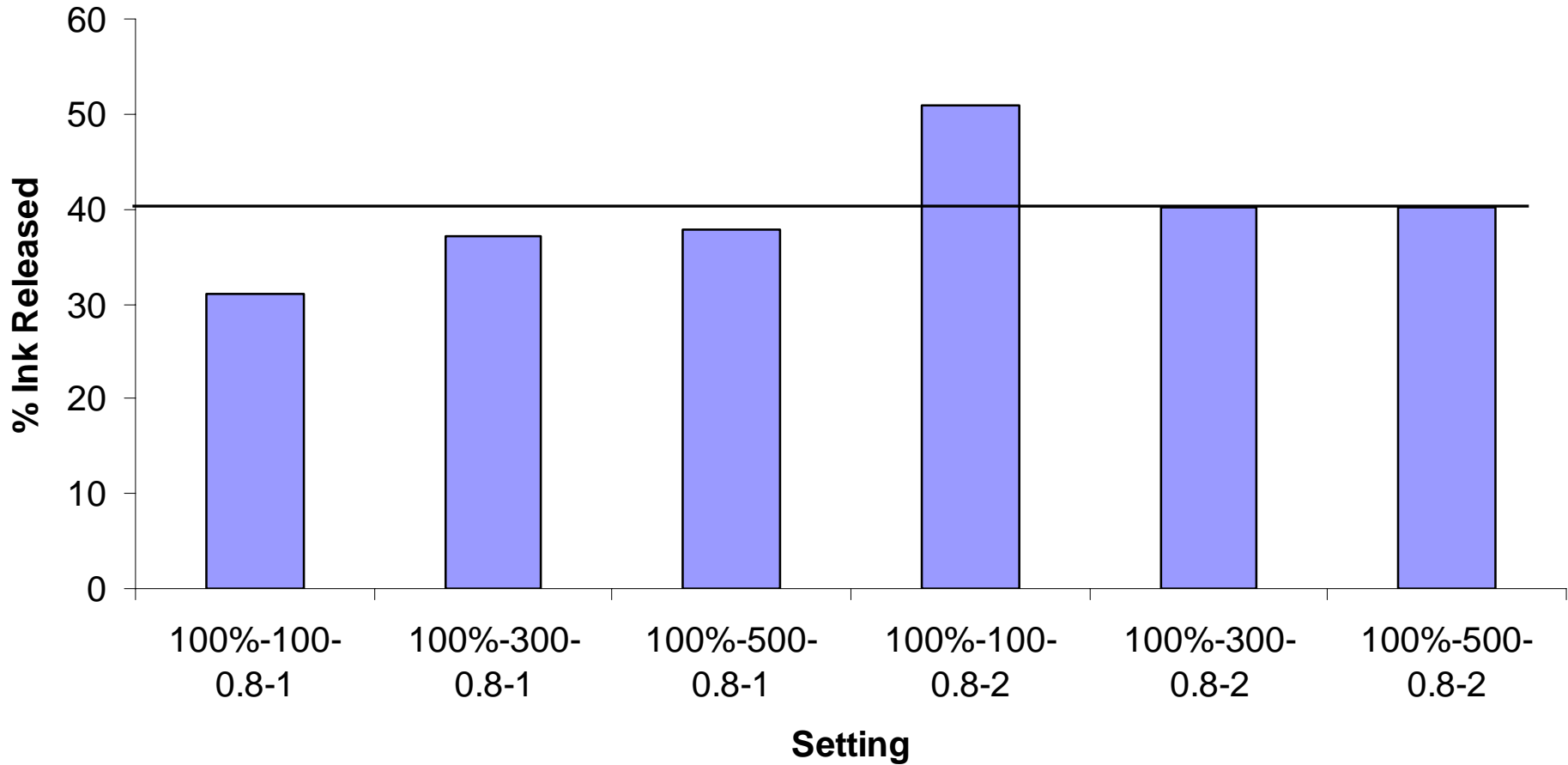
# % Ink released - Anilox 0



Labels represent: Coverage - Anilox pressure(N)-print speed(m/s)



# % Ink Released – Anilox 1 & 2



Labels represent: Coverage - Anilox pressure(N)-print speed(m/s)-Anilox No.



# Inked Printed Volume



- Changing speed has little effect.
- Ink release with increasing pressure
  - Increases to a maximum of 42% and then falls for anilox 0
    - Smallest open area, deepest cells, smallest volume
  - Increases to a plateau of 39% for anilox 1.
    - Medium open area, mid volume
  - Decreases to a plateau of 40% for anilox 2.
    - Largest open area, largest volume
- First approximation ink release 40%.



# 30% Halftone

