METRO
PRODUCTION
CONFERENCE

PROCESS OPTIMIZATION

Your Ticket to Success

May 29, 2015 11:20 AM - 12:00 PM and 3:00 PM - 4:30 PM








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PRE-PRESS

COMMON FACTORS INFLUENCING REGISTRATION

- → Pre-press Errors
  - → Plate cut, CtP, Punch and Bend
- → Mechanical problems on the press
  - → Locking pin position adjustment
  - → Cylinder gripping system
  - → Cylinder and blanket alignment and position
- → Paper FanOut
- → Human error:
  - → Plates alignment on punch, bender, and press.

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REGISTRATION SOLUTIONS

- → On-press dynamic solution
  - → Bustle wheel to compensate for paper FanOut
  - → Auto register to align the plate cylinders
- → Off-press static solution
  - → Software solution such as ProImage “Press Register “
    - → Shifts, rotates and scales TIFF image on plate

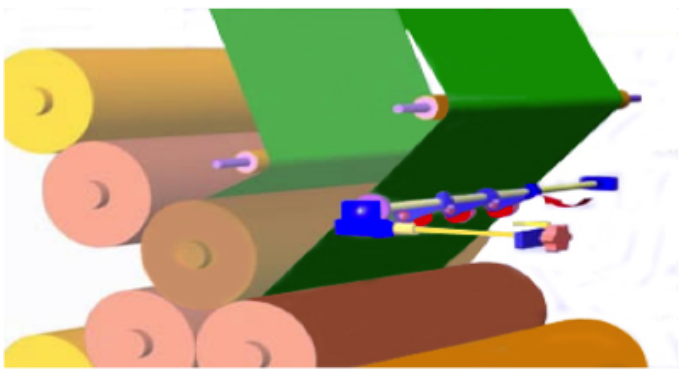

Figure 1: Bustle Wheel

Figure 2: QuadTech Auto Register[4]

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SOFTWARE SOLUTION - ``PRESS REGISTER ``

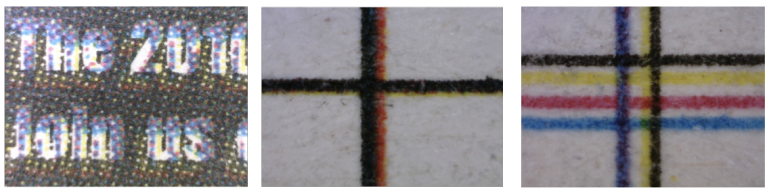

Figure 3: Before pre-press register correction

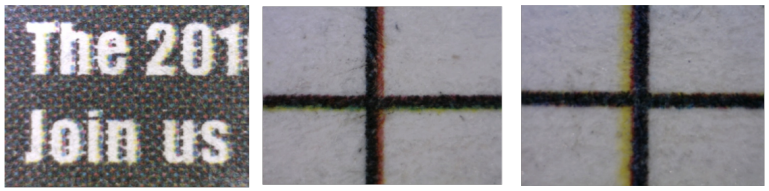

Figure 4: After pre-press register correction

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INK OPTIMIZATION

- What is ink optimization?
  - Generally refers to Gray Component Replacement (GCR)
  - Transform “CMY” ink components into “K” ink
- Why use ink optimization?
  - Reduces cost
  - Less rub-off, smearing, and show-through
  - Cleaner press
- Key Features
  - Preserve image quality
  - Uses ICC profile
- Things to watch-out for
  - Excess replacement of “CMY” with “K” causes density fluctuation and bad ink/water balance

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PRESS

INK PIPING

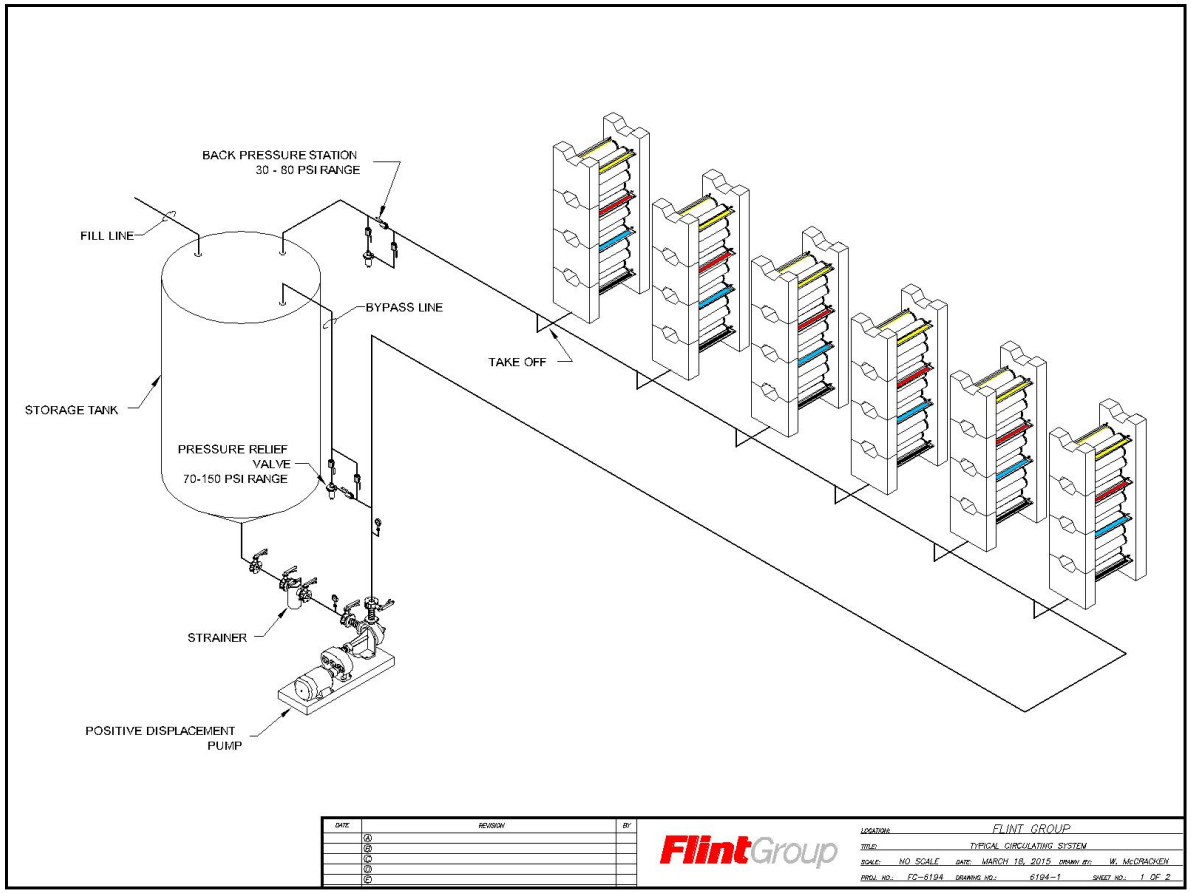

Figure 5: Ink Circulation

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INK PIPING HIGH PRESSURE

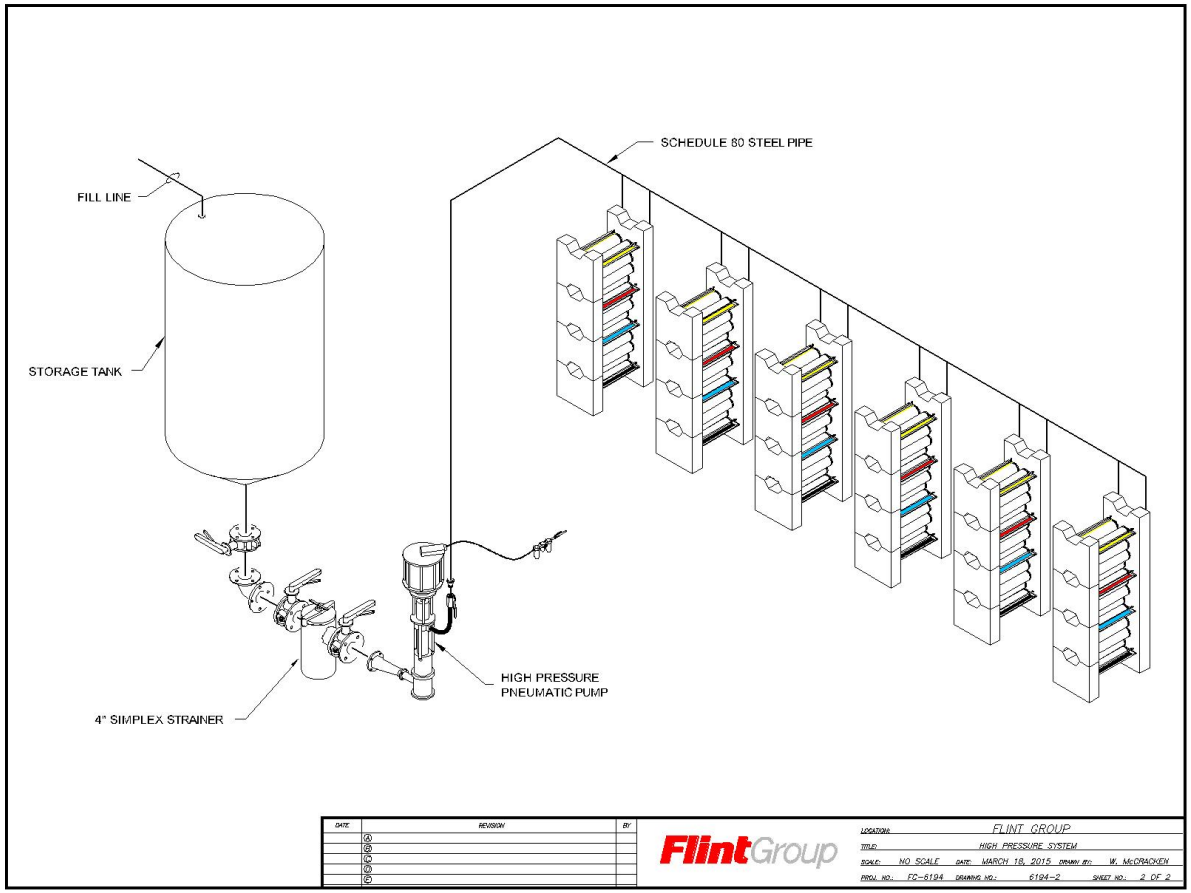

Figure 6: High Pressure Ink Circulation

INKING

- → Ink delivery
  - → Air
  - → Debris
  - → Filtration
- → Ink piping
  - → Ink flow
  - → Circulating and dead-end system
  - → Ink train starvation
  - → Temperature
- → Ink input
  - → Open fountain
    - → Ink drip in between fountain roller and blade
    - → Ink is backing off roller
    - → Water in ink fountain: ink/damp interaction
  - → Rail
    - → Mechanical pack
    - → Digital pack

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INKING CONT.

- → Rail/fountain roller
  - → Full speed ink input
  - → Slow ink input
- → Ink train length
  - → Short train
    - → Ink/water balance
  - → Normal length
- → Driven drums
  - → All driven
  - → Some are not driven
    - → Ink/water balance

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DIFFERENTIAL SURFACE SPEED

- → Ink train roller slip
  - → Ink/water balance
  - → Toning
  - → Water build-up in train
- → Dampener train slip
  - → May be okay, but NOT on plate
- → Ink form slips to plate
  - → Ink/water balance
  - → Plate wear
- → Plate Thickness
  - → Ink/water balance
  - → Toning
- → Blanket height
- → Roller diameter and durameter

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DAMPENER TYPE

- → Ink train dampening
- → Direct to plate dampening
- → Combination of both
  - → Ink/water balance
  - → Curve setting

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INK/WATER BALANCE

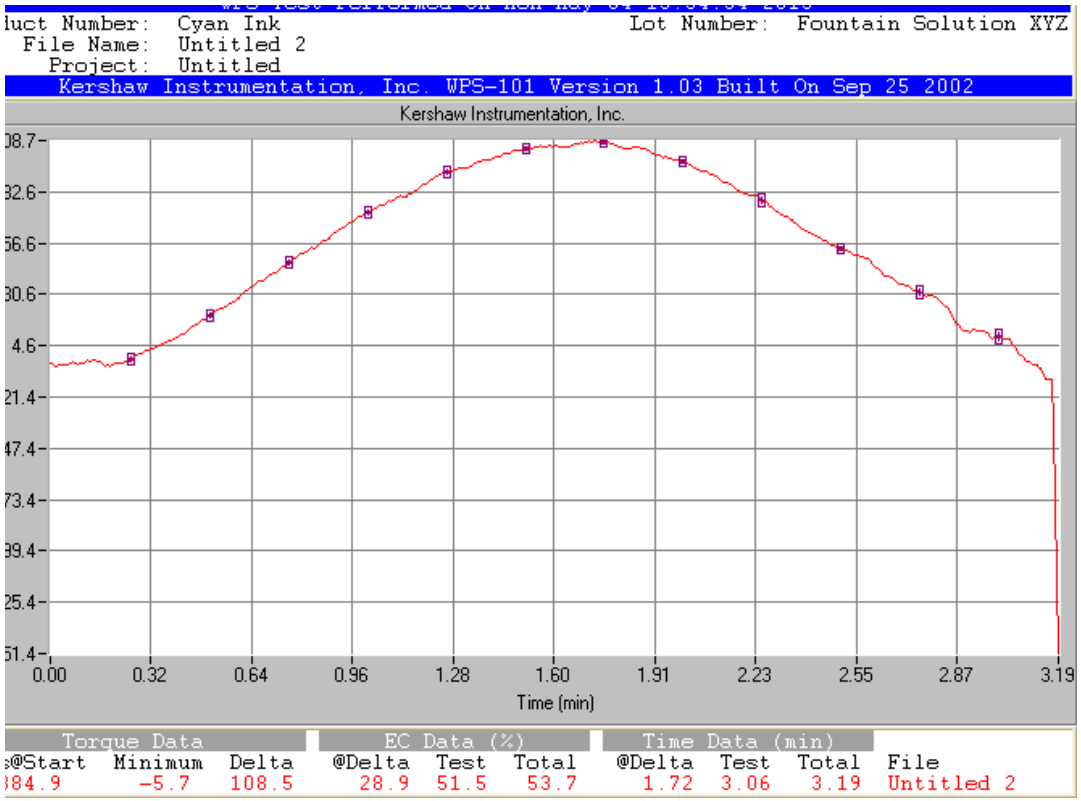

Figure 7: Kershaw Printed Results

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DAMPENER INPUT

→ Brush

→ Spray bars

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PRESS SEQUENCES START-UP

- RTP Type
  - Static belts
  - Constant tension
    - Soft tension capability
- Start-up sequence
  - Press speed trigger
  - Dampening system start, then forms on (Direct to Plate)
  - Auto-flood start
  - Ink forms on, then ink system start

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PRESS SEQUENCES, CONT.

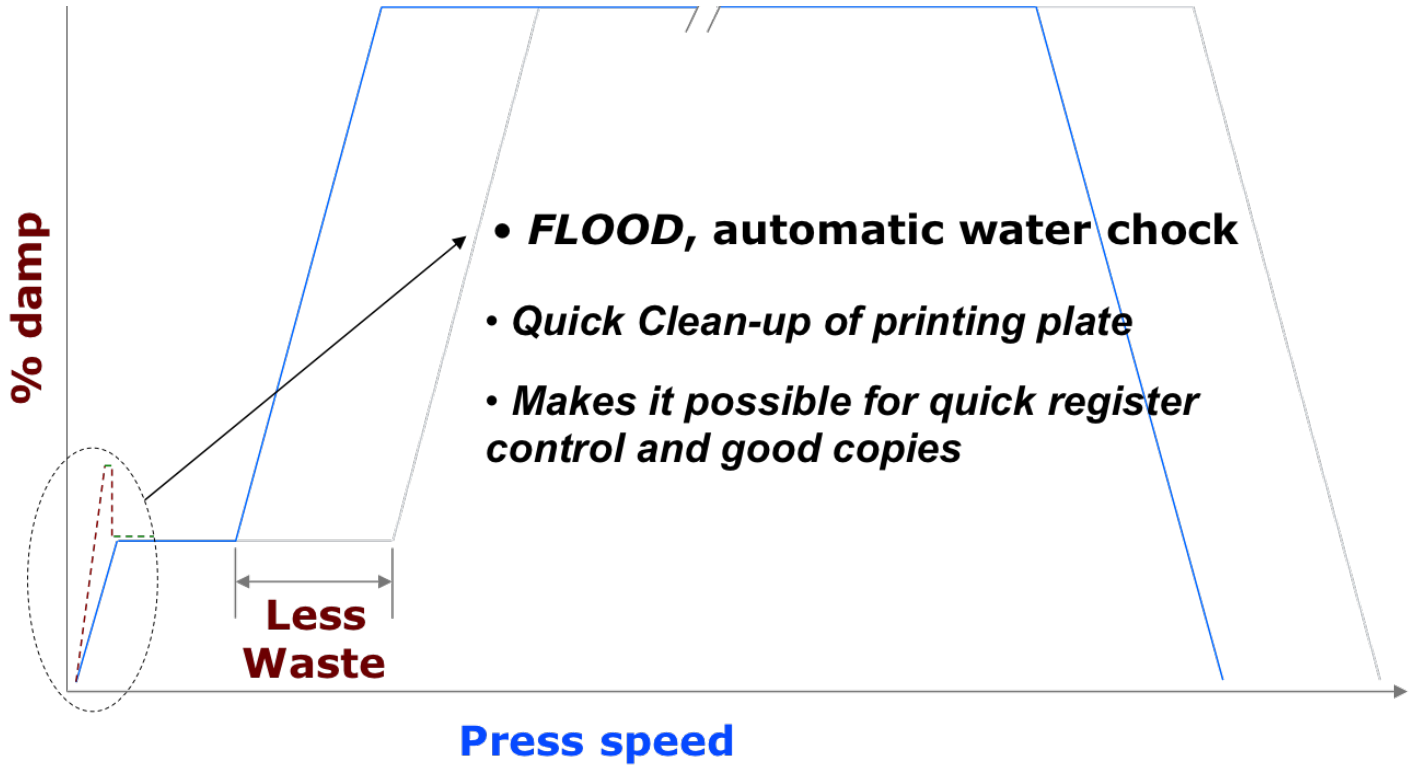

Figure 8: Start Up Flood

PRESS SEQUENCES, CONT.

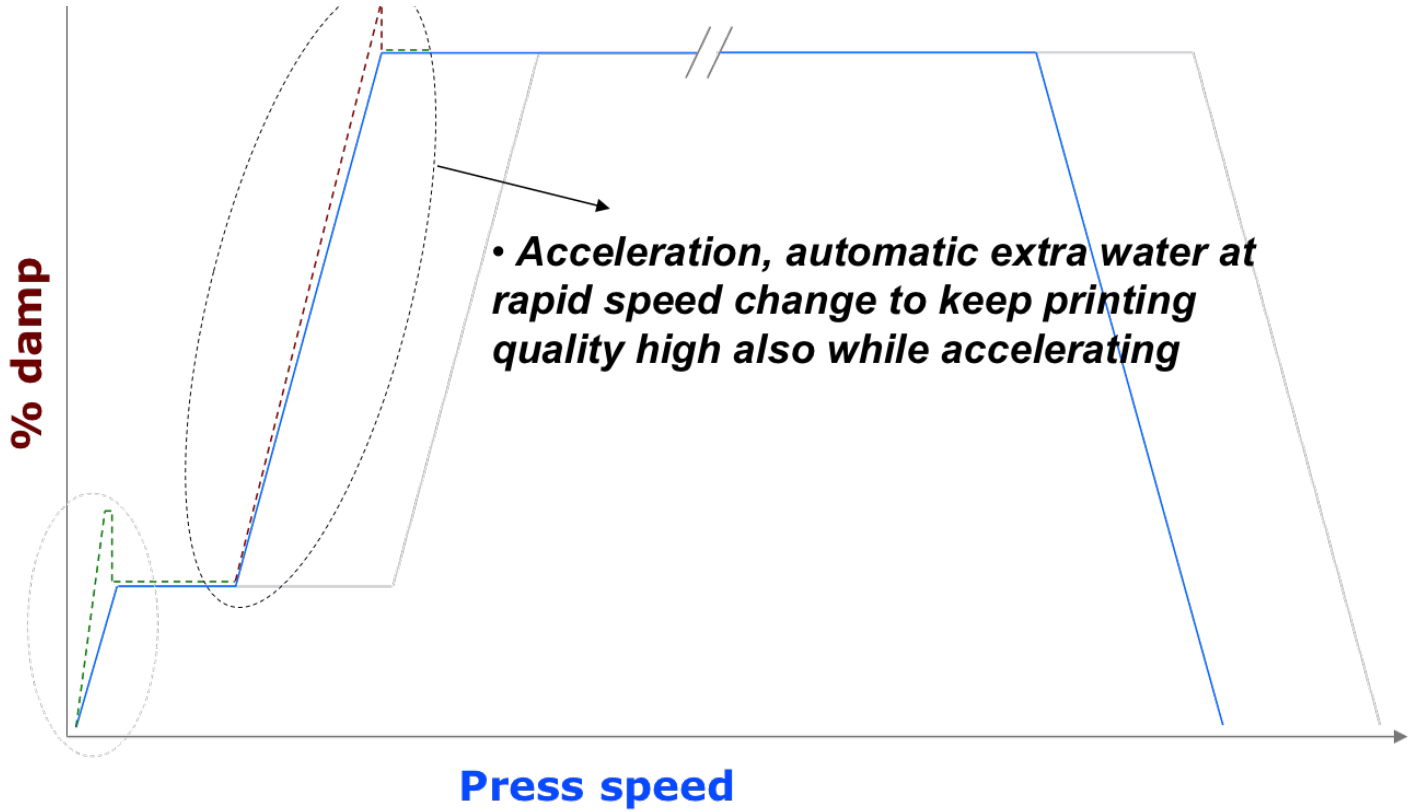

Figure 9: Acceleration Damp Increase

PRESS SEQUENCES, CONT.

Shut Down:

- → Normal stop: end of run or plate change
  - → Press speed trigger
  - → Ink system off at trigger
  - → Ink forms stay on for a few seconds to remove excess ink
  - → Dampening system and forms off a few seconds later.
- → Emergency stop or red button stop
  - → Impression stays on
- → Web break
  - → Impression goes off

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BLANKETS

OBJECTIVES

Objective of optimization:

→ Even solids

→ Distinct contrast

→ Consistent web handling

→ Maximum durability

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BLANKET VENDOR DIALOGUE

Make sure to disclose:

- → What you are printing
- → What ink you are using
- → What paper you are using
- → Pack or no pack guage

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CORRECT BLANKET GAUGE

Yields:

- → Controlled registration and release
- → Stabilized web control
- → Maximized plate life
- → Consistent print pressure
- → Increased blanket life

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CORRECT BLANKET GAUGE, CONT.

Yields:

→ Optimized transfer
→ Controlled dot structure

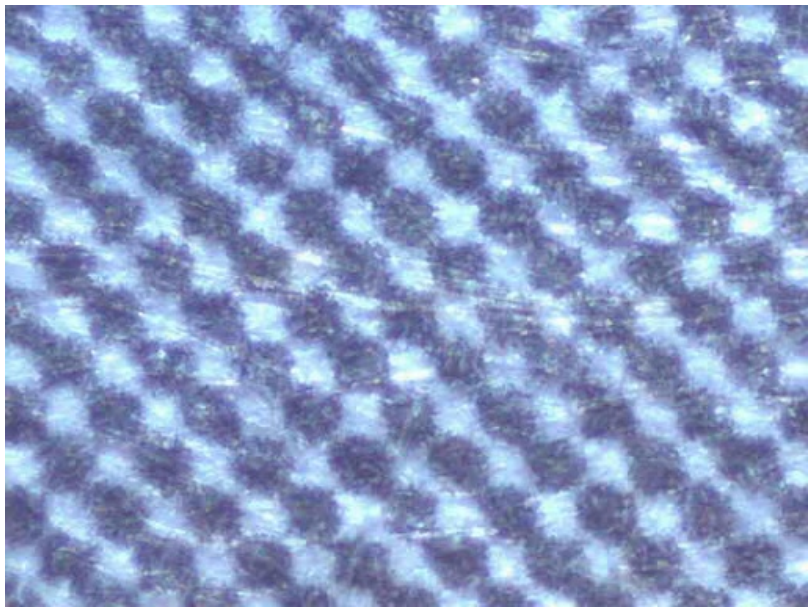

Figure 10: 50% black - 0.003" Under Gauge Blankets

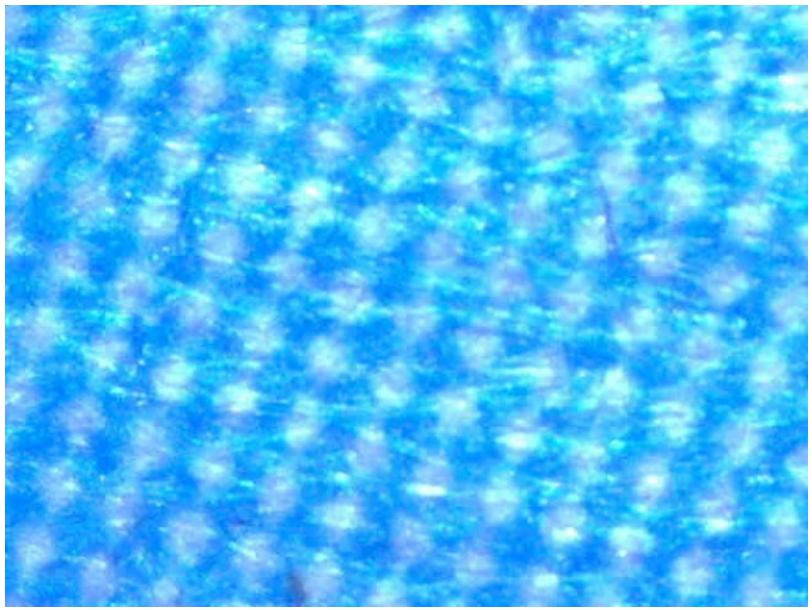

Figure 11: 50% Cyan - 0.003" Under Gauge Blankets

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PROPER MOUNTING AND TORQUING

Proper technique will yield:

- → Intended function of designed layers
- → Proper conformation to the cylinder
- → Protection of critical components of the blanket by controlling compression

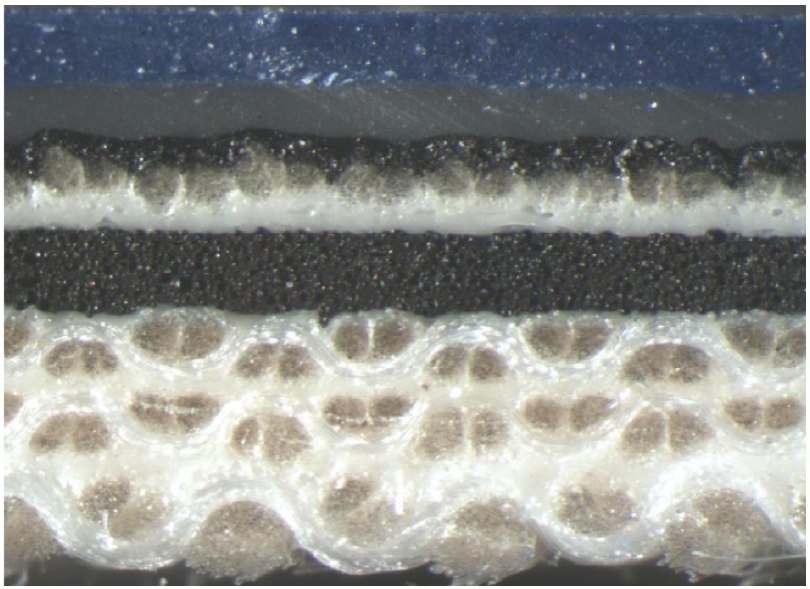

Figure 12: 4 Ply

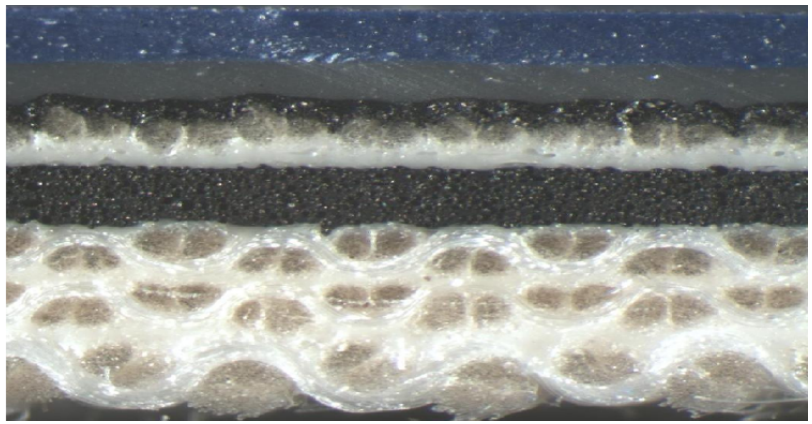

Figure 13: 4 Ply Compressed

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PROPER MOUNTING AND TORQUING

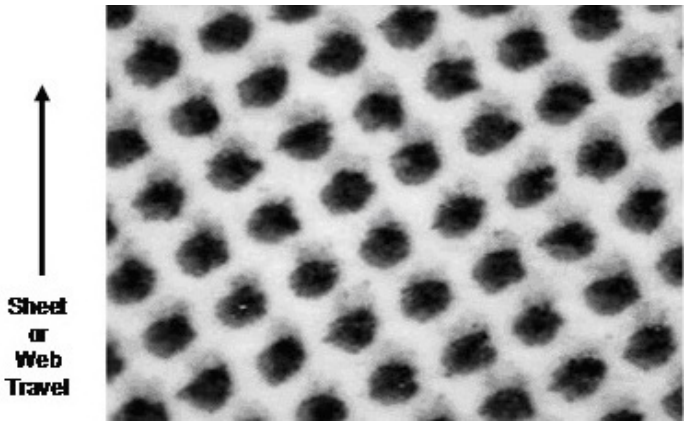

Figure 14: Doubling - Circumferential Movement

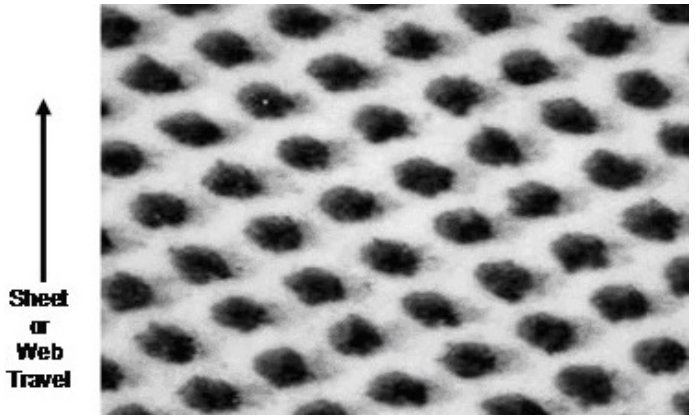

Figure 15: Slurring - Lateral Movement

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PROPER MOUNTING AND TORQUING, CONT.

Proper technique will yield:

→ Reduced blanket gapping or “hour glassing”

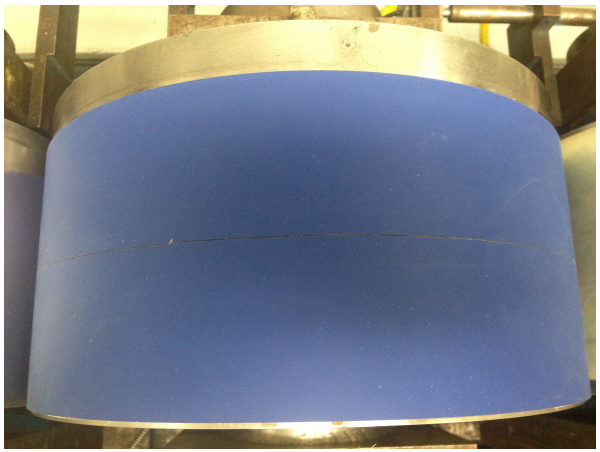

Figure 16: Blanket Not Gapped - Correct Torque

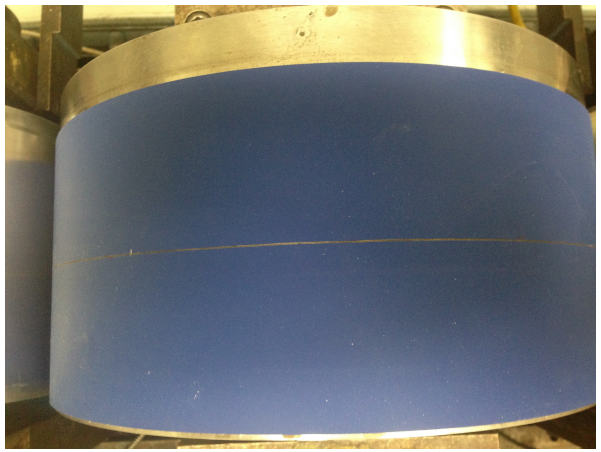

Figure 17: Blanket Gapped - Over Torque

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PROPER MOUNTING AND TORQUING, CONT.

Proper technique will yield:

- → Improved smash resistance
- → Improved web handling
- → Improved print quality
- → Improved register

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PROPER MOUNTING AND TORQUING, CONT.

Proper technique will yield:

→ Reduced potential for cracking/breaking at the gap

→ Reduced potential for bar pulls

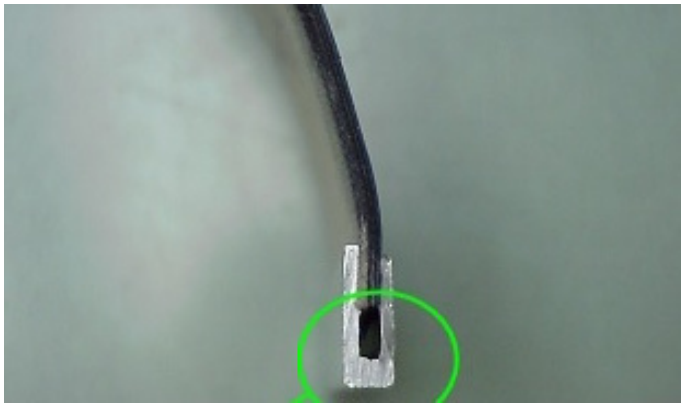

Figure 18: Blanket/Bar not properly installed. Blanket should seat all the way to the back of the bar

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PROPER MOUNTING AND TORQUING, CONT.

Proper technique will yield:

→ Increased potential of printing to the gap

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Figure 19: Gauge at the Gap

THE WELL DESIGNED PROGRAM

An attentive and effective maintenance program includes:

→ Proper mounting procedure for establishing optimum blanket torque:

1. Install blanket on cylinder so that it seats against cylinder body but has minimal tension
2. Mark two lines, approximately 1" long, exactly 5" apart, in the across direction on the blanket face, approximately 180 degrees opposite the cylinder gap in the around direction.
3. Check thickness of blanket with twin pin gage at or near marks
4. Tension blanket to achieve from 1.25% to 1.75% stretch. (5" mark would measure 5 1/16" to 5 3/32")
5. Rotate cylinder, with impression on (plate also has to be installed) for several revolutions
6. Re-tension blanket to tension established in step 4
7. Blanket gauge at gap should be less than .001"

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CLEANLINESS

A clean blanket:

→ Is an absolute necessity for optimized print quality

→ Reduces ink and paper piling and its associated deformation and abrasion of the blanket surface

→ Has all deposits removed before printing resumes

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CLEANLINESS, CONT.

Avoid:

- → Dried ink on the edges that will lead to delamination of the surface
- → Incompatible wash that can swell the blanket, causing release, register, and delamination
- → Improperly adjusted auto washers that can damage the blanket surface
- → Remove excess BW to prevent blanket swell

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PRESSROOM CHECKLIST

How to Print High Quality Offset - The Short List, Cont.

→ Adopt and maintain preventative maintenance program
→ Maintain press manufacturers specifications

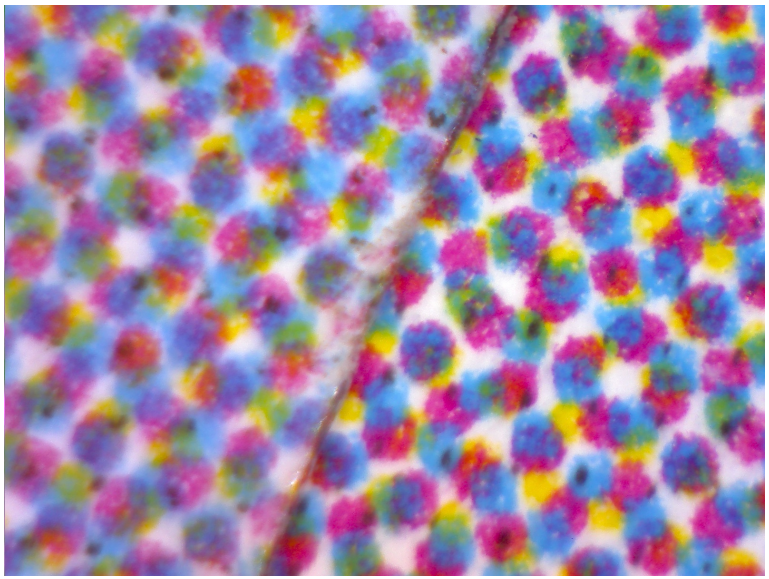

Figure 20: Grey bar before reducing ink and water on left, after reducing on right

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PRESSROOM CHECKLIST, CONT.

How to Print High Quality Offset - The Short List, Cont.

→ Verify correct cylinder settings B to B, B to I, and B to P

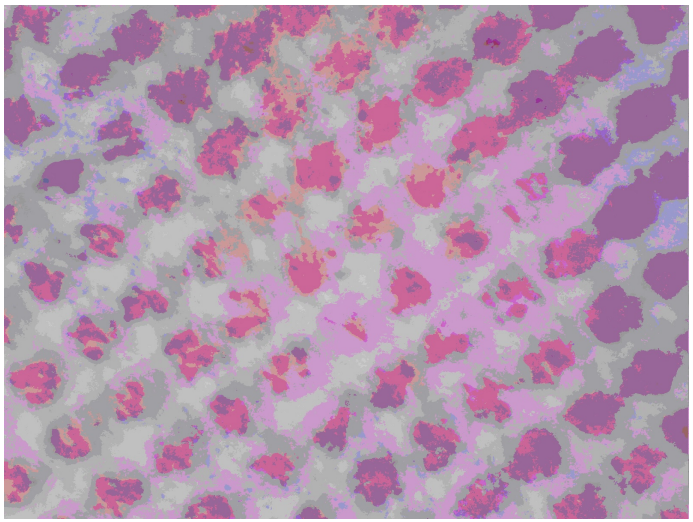

Figure 21: Bearer Setting Incorrect

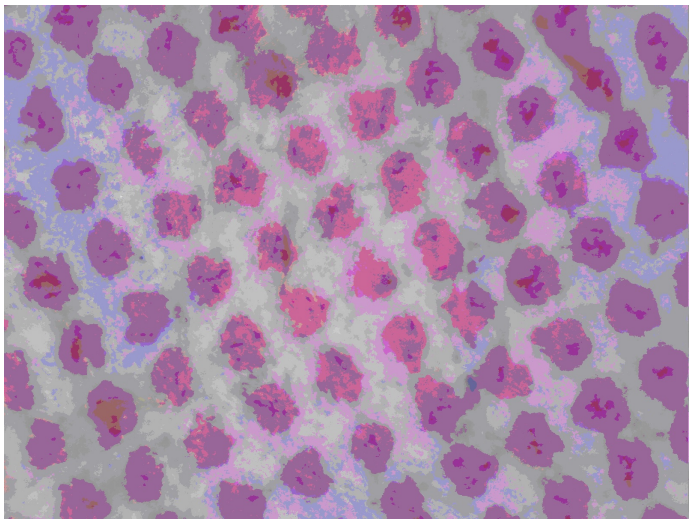

Figure 22: Corrected Bearer Setting

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ROUTINE CHECKLIST

In order to maximize production:

- → Maintain blanket log: installation, imp count, removal date, and removal reason
- → Store blankets in subdued light and clean environment
- → Clean blankets of ink and paper piling daily
- → Correctly set blanket washers
- → Minimize edge saturation with blanket wash
- → Identify loose blankets
- → Find and remove damaged blankets
- → Track blanket surface condition
- → Avoid excessive temperatures

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ROUTINE CHECKLIST, CONT.

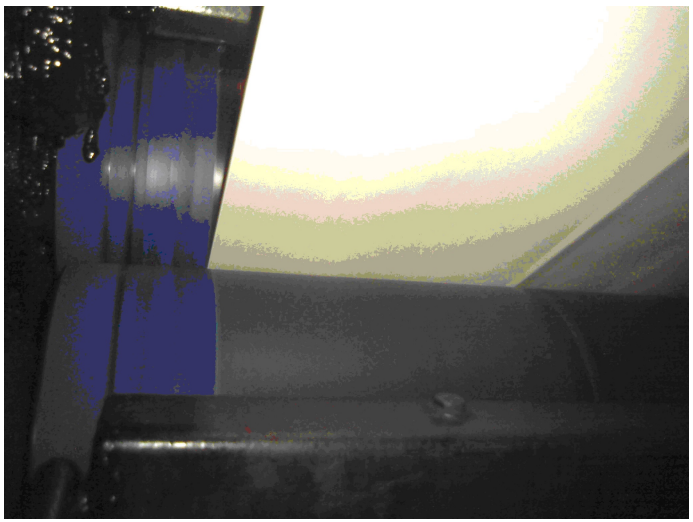

Figure 23: Image of Print and Non-Image

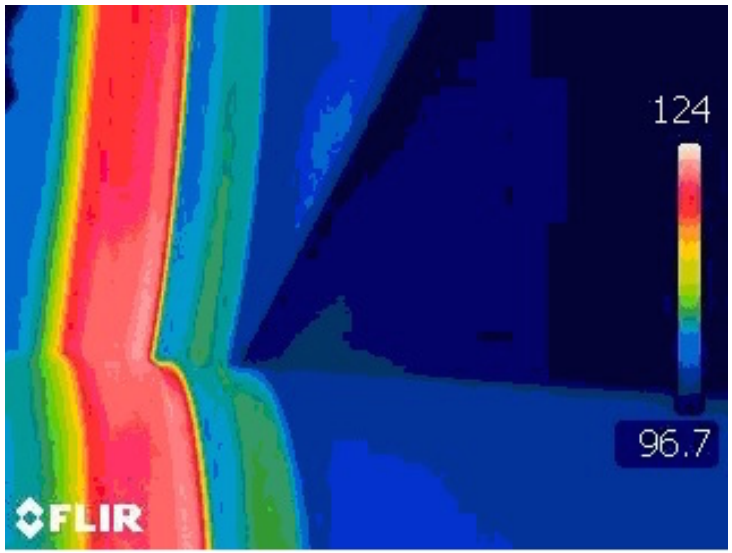

Figure 24: IR Scan of Print and Non-Image

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ROUTINE CHECKLIST, CONT.

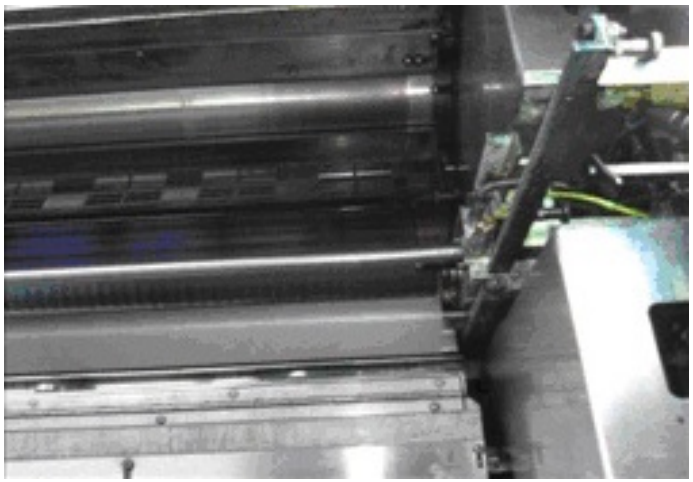

Figure 25: Image of Press Roller

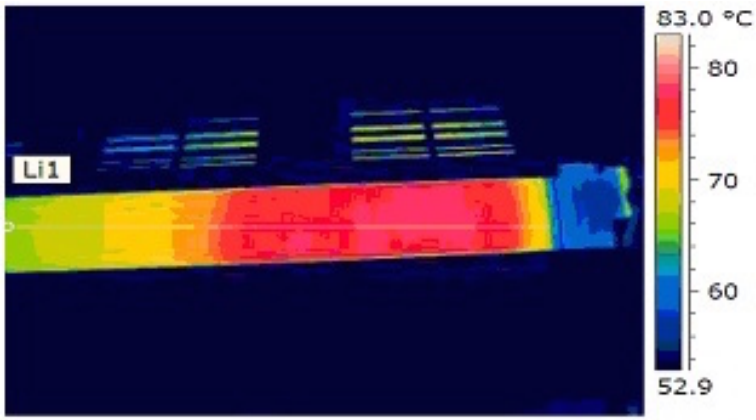

Figure 26: IR Scan of Press Roller

BLANKET REMOVAL INDICATORS

- → Blanket surface shows signs of glazing
- → Blanket surface shows signs of cuts/smashes
- → Web becomes unmanageable under normal settings
- → Ink water balance is difficult to achieve and maintain
- → Loss of print or degradation of print quality

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BLANKET REMOVAL INDICATORS, CONT.

Figure 27: Loss of Print

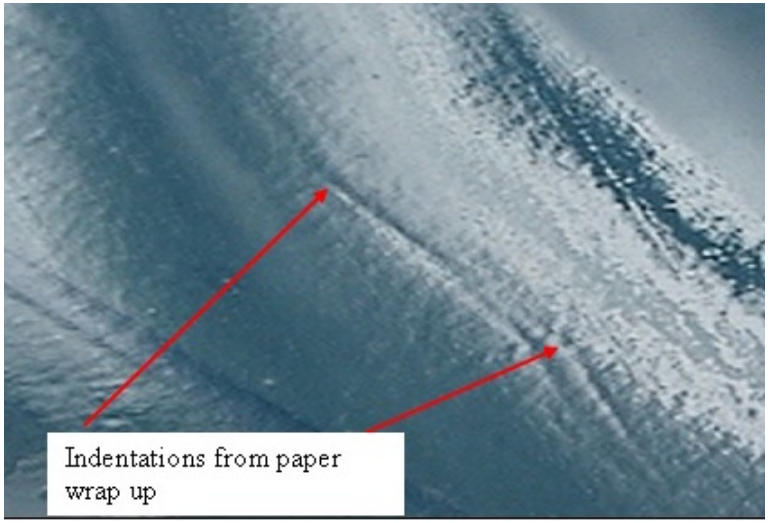

Figure 28: Blanket Face Fracture

BLANKET REMOVAL INDICATORS, CONT.

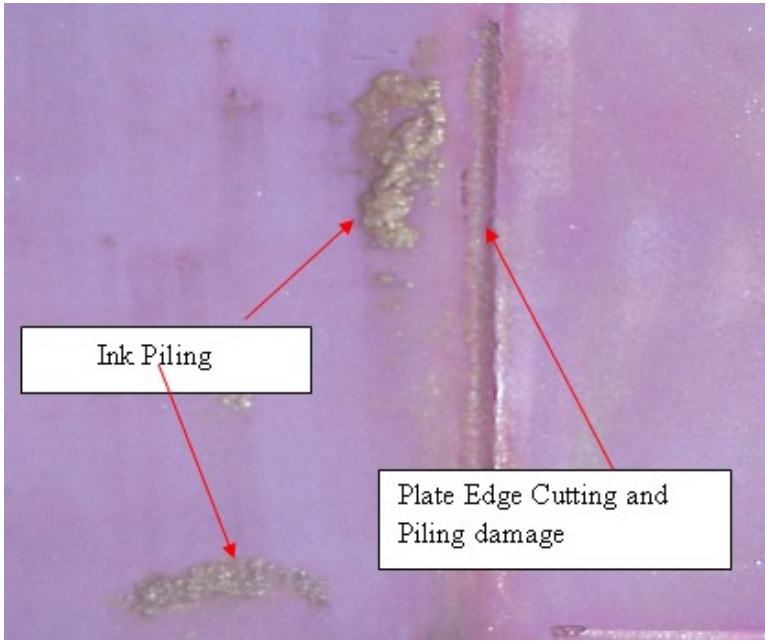

Figure 29: Blanket Ink Piling

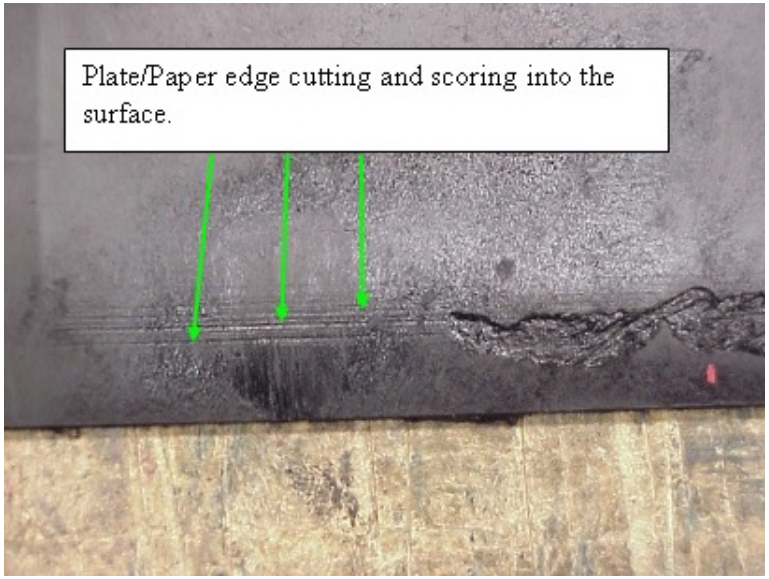

Figure 30: Plate Edge Cutting

DAMPENING SOLUTION

INCOMING CHEMISTRY - PROCESS MONITORING

- → QA incoming chemistry
  - → pH/Conductivity at specified dilution
  - → Concentrate density with a hydrometer
  - → Concentrate clarity
- → Monitoring
  - → pH
  - → Conductivity: what is the ideal number, influencing factors
  - → Temperature - what should the temperature be?
  - → Dosage with conductivity curves

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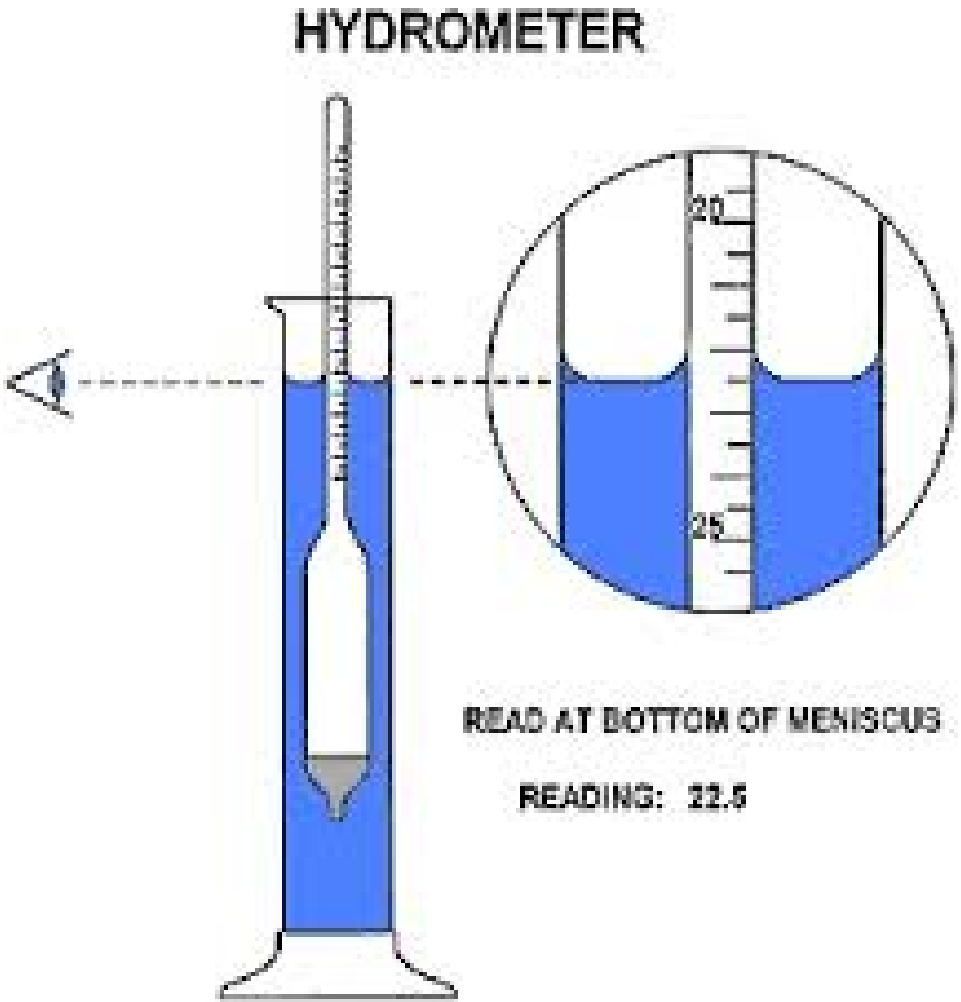
DENSITY WITH A HYDROMETER



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SYSTEM MAINTENANCE

- → Set mixer dynamic pressure to spec
  - → It ensures spray pattern consistency, correct overlap and atomization
- → Replace filters

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SYSTEM MAINTENANCE

- → Checking for biological growth
  - → Hach paddle tests
  - → Hand held RLU test

Figure 31: Hach Test

Figure 32: Hand held RLU test

SYSTEM MAINTENANCE

- → Cleaners
  - → Peroxide vs. bleach(oxidizers)
  - → Shocking the system with biocides
  - → Custom cleaners
- → Scheduled cleaning - time frames

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FOUNTAIN SOLUTION SELECTION

- → Press Type
- → Dampening system
- → Water type
- → Plates/Ink
- → Paper types
- → Environmental factors
- → Approvals(FOGRA)

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SPRAY BARS

TESTING

- → Off-press volumetric testing
  - → Valve performance
  - → Distribution testing
    - → Nozzle performance
    - → Distance setting: overlaps
- → On-press mechanical adjustment
  - → Bar distance
    - → Dry bands
    - → Wet bands
  - → Bar angle
    - → Spraying at roller crown
    - → Spraying into roller nip

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OFF-PRESS TESTING

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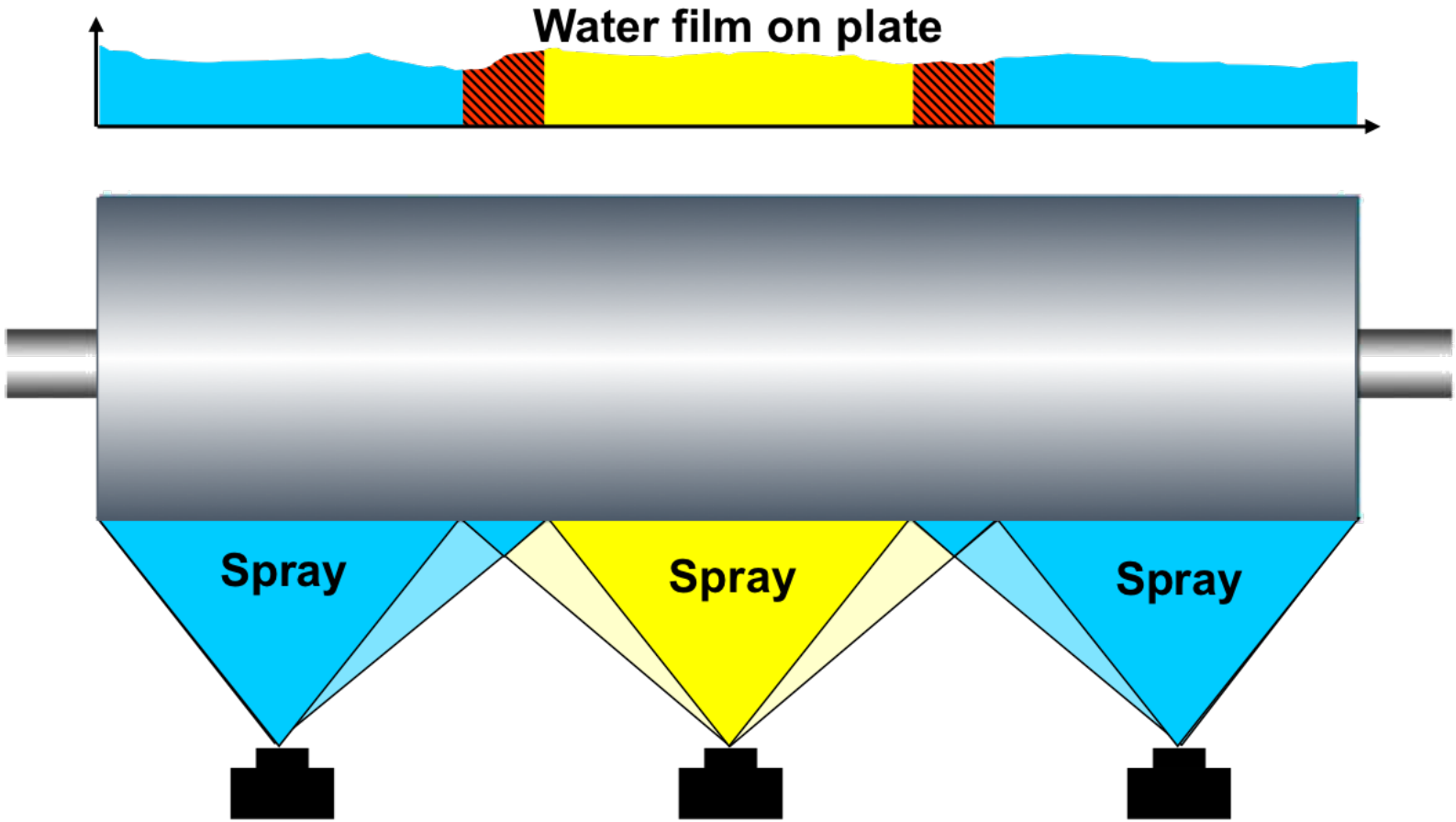
PRESS SEQUENCES - START-UP FLOOD



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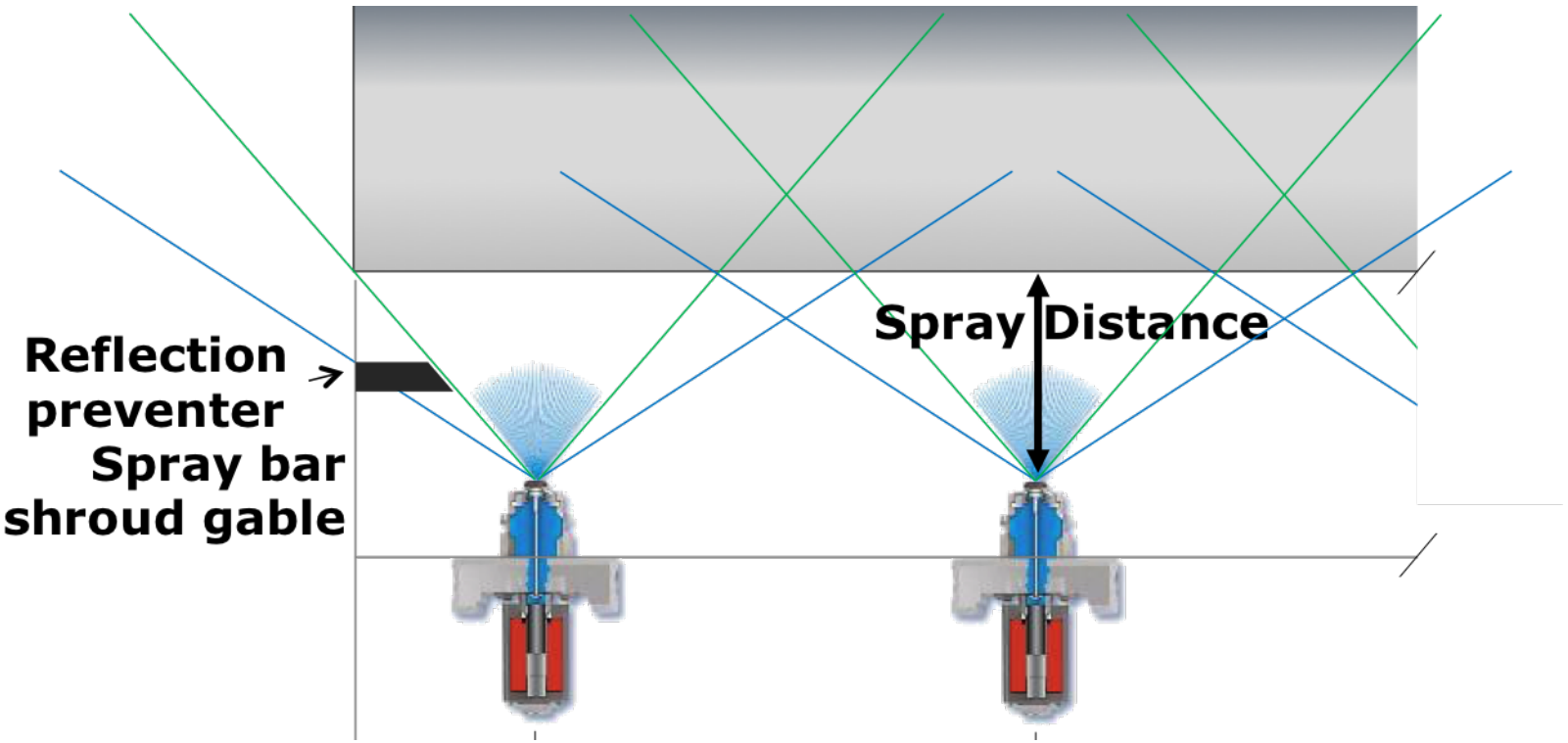
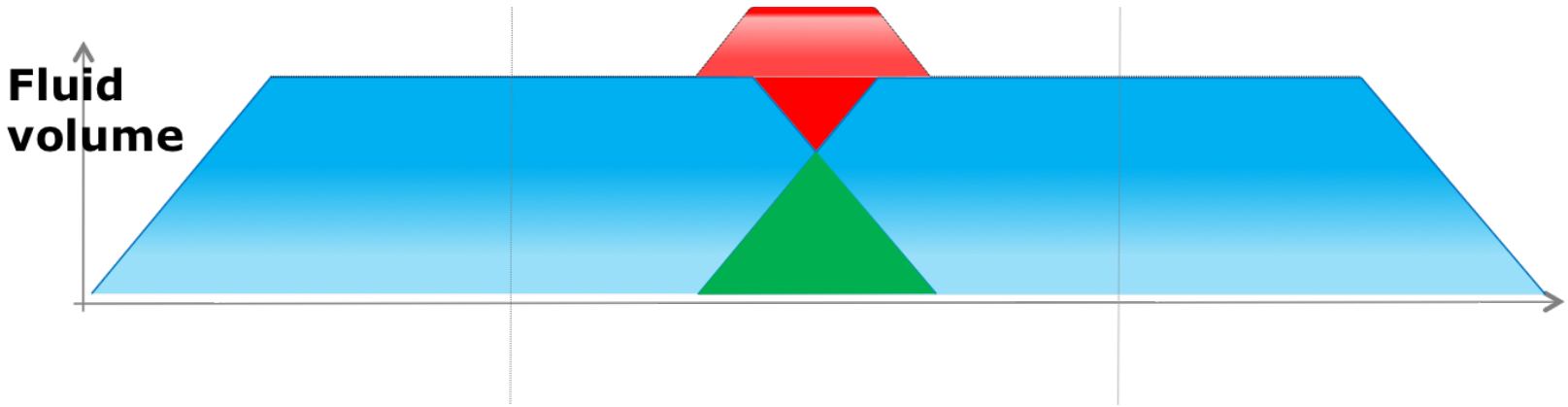
NOZZLE, CENTER TO CENTER DISTANCE



CORRECT SPRAY BAR DISTANCE



SYSTEM CONTROL ADJUSTMENTS

- → control method
  - → Variable on-time
  - → Fixed on-time
- → Water Curve
  - → Track press speed
- → Water Curve
  - → Allows the correct water volume at all press speeds
- → Flood
  - → Fast start-ups and low waste
- → Start-up sequencing
  - → Fast start-ups and low waste

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GOSS | INTERNATIONAL

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