

# Sheetfed Offset Troubleshooting Guide

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## **Backing**

**Problem:** New ink fails to replace ink removed by fountain roller, resulting in progressively lighter color.

**Cause:**

1. Insufficient ink in fountain; ink too thixotropic
2. Ink too short and buttery

**Solution:**

1. Add virgin ink to fountain; stir ink in fountain with knife to keep fluid
2. Consult ink manufacturer to reformulate ink for better flow

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## **Back-trap Mottle**

**Problem:** Ink is pulled from printed surface onto blanket as sheet passes through successive printing nips.

### **Cause:**

1. Work and turn inks set too quickly
2. Dark color inks are printed on first and second units
3. Poor layout sequence: solid is over-printed by another solid or screen tint
4. Improper tack sequence
5. Ink dries during long make-readies
6. Excessive solvent evaporation due to press speed
7. Substrate (usually glossy) susceptible to back trapping
8. Press design; the greater the distance from the first to last printing unit, the greater the potential for mottle
9. Excessive paper-to-blanket pressure
10. Improper compressible blanket

### **Solution:**

1. Consult ink manufacturer for more stable, slower drying ink
2. Adjust ink sequence
3. Adjust layout and/or sequence to print lighter cover forms before heavier
4. Use tack-graded inks, printing highest tack inks first; use properly formulated uniform tack inks
5. Clean press to shorten make-ready times
6. Reduce press speed and use fresh ink
7. Consult paper manufacturer; change substrate
8. Change printing sequence if possible
9. Reset to manufacturer's specifications
10. Consult blanket manufacturer; change to quick-release, solvent resistant blanket

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## **Chalking**

**Problem:** Ink pigment does not bind to stock.

### **Cause:**

1. Ink vehicle penetrates stock too quickly
2. Insufficient drier in ink for particular stock
3. Stock too acidic
  
4. Ink too strong (ink film too thin)
5. Fountain solution pH too low
  
6. Ink film too soft; no hold-out

### **Solution:**

1. Bind ink to paper with overprint varnish or sealing size
2. Consult ink manufacturer regarding new ink for particular stock
3. Change stock; consult ink manufacturer to reformulate ink for particular stock
4. Consult ink manufacturer to weaken ink
5. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
6. Consult ink manufacturer regarding new ink for more hold-out

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## **Color Too Weak**

**Problem:** Solids appear to lack density.

### **Cause:**

1. Improper ink/water balance
2. Improper concentration of fountain solution
3. Non-uniform dampening
4. Loss of image area
5. Improperly set form rollers

### **Solution:**

1. Adjust to proper ink/water balance
2. Adjust fountain solution to proper pH/ conductivity (pH 4.0-4.5)
3. Clean brushes, flicker blades, etc; replace if necessary
4. See PLATE WEAR
5. Adjust form rollers to proper setting

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## **Color Variation**

**Problem:** Inconsistent color reproduction between proof and print or between jobs.

### **Cause:**

1. Substrate variation
2. Process color prints do not match supplied proof
3. Special, spot color does not match proof
4. Different Pantone® Color Formula Guides

### **Solution:**

1. Consult ink manufacturer to adjust hue and hold-out of ink; Consult substrate manufacturer to change stock
2. a) Consult color separator to determine best ink hue for reproduction of proof;  
b) obtain new color separation for pressroom conditions;  
c) establish standard procedures for all operators
3. Consult ink manufacturer
4. Printer's customer, printer and ink manufacturer must all use same formula guide for exact matches

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## **Crystallization**

**Problem:** Succeeding colors do not adhere to previously dried ink.

### **Cause:**

1. Base ink film too high in hard waxes
2. Delay between colors too long
3. Excessive use of spray powder on base colors
4. Dry ink forms hard film
5. Base ink film contains too much drier
6. Infra-red drier forms hard film

### **Solution:**

1. Consult ink manufacturer to formulate succeeding ink for better lay
2. Run succeeding colors more quickly (if imprinting is required, leave area blank so later colors are printed on plain paper)
3. Wipe prints to remove excess powder
4. Consult ink manufacturer to formulate succeeding ink with more solvent; heat sheets to improve adhesion
5. Consult ink manufacturer for new ink
6. Reduce drying temperature

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## **Dot Gain / Plugging of Screen**

**Problem:** Printed halftones appear muddy, show higher values than proof.

### **Cause:**

1. Improper pressure setting between plates, blankets and rollers
2. Ink body too long
3. Ink too water-receptive
4. Piling
5. Plate not sharp enough
6. Poorly desensitized plate
7. Poorly ground ink
8. Insufficient fountain solution
9. Excessive ink on roller train
10. Blankets or rollers too soft
11. Improperly packed blankets

### **Solution:**

1. Adjust to proper pressure setting
2. Consult ink manufacturer for stiffer ink
3. Consult ink manufacturer
4. See PILING
5. Coordinate with cameraman and platemaker for sharper halftones, negatives, positives and plates
6. Desensitize plate; replace if necessary
7. Consult ink manufacturer
8. Increase fountain solution to cover plates evenly; check for dirty dampener cover and replace if necessary
9. Reduce ink; reduce fountain solution
10. Recondition blankets or rollers; replace if necessary
11. Adjust packing

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## Drying

**Problem:** Ink film remains wet or tacky to the touch.

### Cause:

1. Ink taking up too much water
2. Ink film too thick
3. Uneven plate dampening
4. Paper contains excessive water; non-absorbent stock
5. Improper fountain solution pH/conductivity
6. Inappropriate ink for particular stock
7. Insufficient air/oxygen circulation
8. Relative humidity too high

### Solution:

1. Adjust to proper ink/water balance; consult ink manufacturer
2. Adjust press settings to carry less ink; consult ink manufacturer
3. Clean dampeners thoroughly; check windows, vents and forced air systems to prevent drafts
4. Change stock
5. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
6. Consult ink manufacturer
7. Fan sheets between printing and other operations; use anti-set-off spray to keep sheets apart; impervious sheets such as plastic and foil should be kept in small lifts, slip sheeted or fanned frequently
8. Control pressroom humidity

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## **Fading**

**Problem:** Images, usually large solids or solid tints, lose color while drying or when exposed to light.

**Cause:**

1. Insufficient oxygen for drying causes oxidation of pigments
2. Ink pigments susceptible to fading

**Solution:**

1. Consult ink manufacturer; if pigments are susceptible to oxidation, fan sheets intermittently after printing
2. Where lightfastness is important, consult ink manufacturer to reformulate ink with permanent pigments

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## ***Ghosting – Gloss***

**Problem:** Chemical Ghosting or Gas Ghosting: A large solid on the back-up side of a sheet shows excessive gloss opposite the ink on the side printed first.

### **Cause:**

1. Large solids printed on a back-up form
2. Lifts too large
3. First side backed-up too soon after being run
4. Inks too glossy

### **Solution:**

1. Print heavy form first and lighter form on back-up side
2. Run small lifts when backing up the sheets
3. Hold lifts three days (per GATF) before printing back-up side
4. Fan sheets before printing back-up side; keep lifts in sequence for back-up; keep lifts away from excessive heat or cold; run sheets through press without printing to supply fresh air before printing back-up side; on small, expensive runs, slip-sheet stock while printing back-up side

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## ***Ghosting – Mechanical***

**Problem:** A light or dark print of another part of an image appears in large solids or dense halftones.

**Cause:**

1. Poor job layout
2. Ink film too thin
3. Ink too transparent

**Solution:**

1. Improve job layout
2. Consult ink manufacturer to weaken ink for heavier film
3. Consult ink manufacturer to reformulate ink for greater opacity

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## **Gloss**

**Problem:** Ink has poor reflective properties.

**Cause:**

1. Stock too absorbent; paper surface too rough/grainy
2. Press dampeners: inking system contains excessive water
3. Ink film too thin
4. Excessive ink penetration into stock

**Solution:**

1. Consult paper manufacturer; change to smoother, non-absorbent stock
2. Reduce amount of fountain solution; consult ink manufacturer for more water-resistant ink
3. Increase ink film thickness
4. Consult ink manufacturer for ink with more hold-out or use overprint varnish

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## **Hickies – Donut**

**Problem:** Donut-shaped white spots on printed surface. Donut-shaped hickies indicate particulate. (See *Irregularly-shaped*)

**Cause:**

1. Dried ink particles
2. Roller particles
3. Dampener cover particles
4. Plate particles
5. Foreign particles

**Solution:**

1. Avoid ink skin when handling ink; cover exposed ink; clean press well and often; remove dried ink from fountain edges and roller ends
2. Recondition rollers and drums; replace if necessary
3. Replace sleeves and rollers if necessary
4. Check plates for loose coatings or shavings; remove all coatings during processing
5. Improve housekeeping: a) check air systems for circulation of dust, b) vacuum overhead fixtures, c) hang plastic sheeting over press and d) use less spray powder

**NOTE:** Properly maintained “hickie-picker” rollers do work. All require frequent scrubbing for optimum performance.

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## ***Hickies – Irregular***

**Problem:** Irregularly-shaped white spots on printed surface. Hickies with open centers indicate paper problem. (See *Donut-shaped*)

### **Cause:**

1. Loose paper coatings or dust
2. Old or tacky ink pulls coating from paper
3. Excessive dampening solution may lift coating

### **Solution:**

1. Consult paper manufacturer to install vacuum sheet cleaner or to change stock
2. Consult ink manufacturer
3. Adjust ink/water balance

**NOTE:** Properly maintained “hickie-picker” rollers do work. All require frequent scrubbing for optimum performance.

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## ***Ink / Water Balance***

**Problem:** Frequent adjustments required on press to maintain print quality.

### **Cause:**

1. Excessive fountain solution (seen as “orange peel effect”)
2. Fountain solution too strong (seen as weak color)
3. Fountain solution too weak (seen as poor ink lay or “orange peel effect”)
4. Improper dampening roller setting
5. Improper ink form roller setting
6. Improper ink fountain setting
7. Ink too weak
8. Ink taking up too much water

### **Solution:**

1. Adjust dampener setting to proper levels
2. Reduce fountain solution to pH level between 4.0 and 4.5
3. Increase fountain solution to pH level between 4.0 and 4.5
4. Reset rollers: assure that dampener rollers are driven by the vibrator roller and not the plate cylinder
5. Conduct ink stripe test to check for roller pressure; adjust if necessary
6. Adjust ink at fountain to proper level: allow adequate time for adjustment to take effect
7. Consult ink manufacturer
8. Consult ink manufacturer

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## **Mileage**

**Problem:** Too few impressions per pound of ink.

### **Cause:**

1. Improper ink densities
2. Ink penetrates stock too quickly
3. Stock too absorbent
4. Improper ink/water balance
5. Low pigmented inks
6. Excessive waste on start-up
7. Improper job estimates

### **Solution:**

1. Adjust to lower print densities while maintaining acceptable quality
2. Consult ink manufacturer for ink with more hold-out
3. Consult paper manufacturer; change to less absorbent stock
4. Adjust to proper ink/water balance
5. Consult ink manufacturer for ink with greater strength
6. Improve start-up procedures
7. Establish ink history and consistent procedures to improve job estimates

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## ***Misting / Slinging***

**Problem:** Ink being thrown from ink train rollers.

### **Cause:**

1. Excessive ink on rollers
2. Improper ink/water balance
3. Improperly set or worn rollers
4. Ink too long in body

### **Solution:**

1. Adjust press to carry less ink; consult ink manufacturer for stronger ink
2. Adjust to proper ink/water balance
3. Adjust rollers to proper setting; replace if necessary
4. Consult ink manufacturer

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## **Mottle**

**Problem:** Solid areas not of uniform density, resulting in uneven appearance.

### **Cause:**

1. Non-uniform stock surface
2. Improper printing pressure
3. Improperly set or worn form rollers
4. Improper ink/water balance
5. Worn blanket

### **Solution:**

1. Consult paper manufacturer to change stock; consult ink manufacturer for ink for less penetration, strength
2. Adjust printing pressure
3. Adjust rollers to proper setting; replace if necessary
4. Adjust to proper ink/water balance
5. Replace blanket

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## ***Muddy Halftones***

**Problem:** Halftone appearance lacks sharpness in highlight areas.

### **Cause:**

1. Excessive ink on plate
2. Poor materials for reproduction
3. Improperly processed plate
4. Improper form roller setting
5. Improper ink/water balance
6. Excessive dot gain
7. Glazed blanket

### **Solution:**

1. Adjust press settings to carry less ink
2. Check and improve reproduction process
3. Check exposure of plates using Gray scale (Stouffer scale)
4. Adjust setting to manufacturer's specifications
5. Adjust to proper ink/water balance
6. Adjust for dot gain on press and/or plate; see DOT GAIN
7. De-glaze or replace blanket

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## **Picking / Linting**

**Problem: Picking:** Lifting of the coating from coated stocks onto plates, blankets and/or ink train rollers. **Linting:** Accumulation of fibers from uncoated stocks onto plates, blankets and/or ink train rollers.

### **Cause:**

1. Too much water reaching paper
2. Excessive lint, surface trash, coating dust on stock
3. Base stock picks
4. Pressure too high for ink/stock combination
5. Blankets too tacky
6. Ink too tacky for stock

### **Solution:**

1. Adjust to proper ink/water balance
2. Consult paper manufacturer
3. Reject stock if necessary; change to more lint- or pick-resistant stock
4. Adjust impression pressure and repack to manufacturer specifications
5. a) Consult blanket manufacturer,  
b) Treat blanket or change to less tacky blanket, or  
c) Change blanket wash
6. Consult ink manufacturer to adjust ink for less tack

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## ***Piling***

**Problem:** Build-up of ink on printing plates.

### **Cause:**

1. Paper problems
2. Ink is waterlogged
3. Poorly ground ink contains coarse pigment
4. Improperly packed cylinders
5. Improperly set or worn rollers
6. Blankets too tacky

### **Solution:**

1. See PICKING/LINTING
2. Adjust dampener settings; consult ink manufacturer
3. Consult ink manufacturer to rework ink
4. Check specifications and adjust cylinders
5. Check specifications and adjust rollers; replace if necessary
6. a) Consult blanket manufacturer,  
b) Treat blanket or change to less tacky blanket, or  
c) Change blanket wash

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## ***Plate Blinding – Chemical***

**Problem:** Part or all of image on plate does not take ink.  
(See *Plate Blinding – Mechanical*)

### **Cause:**

1. Fountain solution too acidic
2. Excessive gum in fountain solution
3. Plate cleaners and/or scratch removers have dried on plate image
4. Fountain system contaminated by detergent
5. Excessive fountain solution in ink
6. Improperly developed plates; gum adheres to image area

### **Solution:**

1. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
2. Re-etch plates and rub up image areas with press ink; replace fountain solution with tap water; if image returns, replace tap water with fountain solution containing less gum
3. Rinse plate well after cleaning
4. Thoroughly rinse all washed parts before re-installing in press
5. Reduce dampener setting to minimum level; consult ink manufacturer
6. Wash plate thoroughly; remake if necessary

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## ***Plate Blinding – Mechanical***

**Problem:** Part or all of image on plate does not take ink.  
(See *Plate Blinding – Chemical*)

### **Cause:**

1. Excessive linting
2. Excessive plate-to-blanket pressure
3. Improperly set ink and dampening form rollers
4. Abrasive particles destroying images

### **Solution:**

1. See PICKING/LINTING
2. Use pressure gauge to check pressure; adjust to proper level
3. Check setting and durometer; adjust or replace accordingly
4. Check ink grind, fountain solution, solvents, etc.; replace contaminated materials

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## ***Plate Wear***

**Problem:** Gradual loss of image area on plate.

### **Cause:**

1. Improperly processed plates
2. Improperly set ink and/or water form rollers
3. Excessive linting
4. Improper concentration of fountain solution
5. Improperly packed plate and blanket cylinders
6. Running plates beyond capabilities
7. Inks much too strong
8. Poorly ground ink
9. Form rollers too hard

### **Solution:**

1. Check for excess Diazo on plates; improve plate developing process using Gray scale (Stouffer scale)
2. Adjust setting to manufacturers' specifications
3. See PICKING/LINTING
4. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
5. Adjust to manufacturer specifications using Colight or Baldwin gauge
6. Change to higher-quality plates for longer plate life
7. Reduce ink strength to improve lubrication
8. Consult ink manufacturer to rework ink
9. Replace form rollers

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## **Register**

**Problem:** After press has been set for proper registration, some condition prevents consistently good register.

### **Cause:**

1. Improperly aligned press, plate, blanket, and substrate
2. Blanket swollen or embossed
3. Poorly trimmed press sheets
4. Static electricity on press sheets
5. Image improperly aligned on plate

### **Solution:**

1. Make adjustments as needed
2. Replace blanket
3. Fan sheets
4. Fan sheets
5. Check prepress area for film and vacuum problems

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## ***Roller Stripping***

**Problem:** Rollers do not accept ink.

### **Cause:**

1. Fountain solution too acidic
2. Excess water in press
3. Desensitized metal vibrator rollers
4. Glazed form roller
5. Excessive gum in fountain solution
6. Ink too strong
7. Ink too water-resistant

### **Solution:**

1. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
2. Reduce dampener setting
3. Clean, copperize rollers; use less gum in fountain solution
4. Remove rollers from press, de-glaze appropriately and rinse
5. Re-copperize rollers; use less gum in fountain solution
6. Consult ink manufacturer
7. Consult ink manufacturer

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## ***Rub-Off / Scuffing***

**Problem:** Printed ink appears dry, but exhibits poor resistance to rubbing or scuffing when abraded.

### **Cause:**

1. Excessive water on press, in paper
2. Improper pH of fountain solution
3. Ink not fully dry
4. Rough paper surface creates poor rub between unprinted and printed surfaces
5. Excessive ink
6. Ink formulation lacks rub resistance
7. Insufficient binding vehicle in ink

### **Solution:**

1. Reduce dampener settings; change paper
2. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
3. See DRYING
4. Consult ink manufacturer to reformulate ink with more rub resistance
5. Adjust press settings to carry less ink; consult ink manufacturer
6. Consult ink manufacturer
7. Consult ink manufacturer

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## Scumming

**Problem:** Non-image area of lithographic plate accepts ink in random areas.

### Cause:

1. Low alcohol (or alcohol substitute) content in dampening system
2. Glazed blanket, ink rollers or dampening rollers
3. Excessive printing pressure
4. Ink body too greasy, spreads into non-printing areas
5. Plate improperly processed or exposed to light
6. Fountain solution highly bichromated
7. Ink too soft
8. Improper pH of fountain solution
9. Improperly set or worn dampening rollers
10. Ink rollers overheated

### Solution:

1. Adjust to proper alcohol concentration
2. Clean blanket and rollers thoroughly and recondition to manufacturer specifications
3. Reduce printing pressure to proper levels
4. Make sure ink is on-standard; consult ink manufacturer to reformulate ink if necessary
5. Desensitize or re-make plate; adjust plate making process
6. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
7. Consult ink manufacturer for stiffer ink
8. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
9. Adjust rollers to proper pressure; replace cover if necessary
10. Check for worn bearings and replace if necessary; adjust roller pressure

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## ***Set-Off / Blocking***

**Problem: Set-Off:** Ink transfers to the backside of the sheet above.

**Blocking:** Sheets in a bundle or load stick together.

### **Cause:**

1. Ink dries too slowly
2. Insufficient spray powder
3. Lifts too heavy
4. Rough handling of loads

### **Solution:**

1. See DRYING
2. Increase powder application
3. Run shorter lifts; tray the lifts
4. Do not drop or jerk loads

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# Sheetfed Offset Troubleshooting Guide

## **Slurred / Double Image**

**Problem: Slurred:** Dots appear elongated or smeared; occurs on a single unit.

Slide 1 of 2

### **Cause:**

1. Improperly packed cylinders
2. Loose, uneven or soft blanket
3. Excessive play in gears and bearings of plate and blanket cylinders
4. Excessive plate-to-blanket pressure
5. Excessive ink on coated stock

### **Solution:**

1. Check specifications and adjust cylinders
2. Tighten blanket clamps; adjust packing or replace blanket if necessary
3. Adjust to manufacturers' specifications
4. Use "kiss" impression; check form roller stripe for uniformity and width
5. Adjust press to carry less ink; adjust water accordingly

Ask about:

- ▶ Flexography
- ▶ Pub Gravure
- ▶ Pkg Gravure
- ▶ Sheetfed Offset
- ▶ UV
- ▶ Web Offset
- ▶ News Ink

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## ***Slurred / Double Image***

**Problem: Double:** Second image appears beside first; occurs on multiple units.

*Slide 2 of 2*

### **Cause:**

1. Improper gripper setting
2. Unstable paper; paper is fanning in successive units
3. Loose plate
4. Loose, uneven or soft blanket

### **Solution:**

1. Adjust gripper setting
2. Adjust ink/water balance to lowest possible level
3. Check; secure
4. Tighten blanket clamps; adjust packing or replace blanket if necessary

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## *Tinting / Toning*

**Problem:** Emulsified ink transfers to printed sheet as background tint.

### **Cause:**

1. Ink bleeds into fountain solution
2. Improper concentration of fountain solution
3. Improper ink/water balance
4. Pressure between plate and blanket too high
5. Improper setting or durometer of dampener or ink rollers
6. Ink insufficiently resistant to water
7. Improperly exposed or developed plates
8. Prolonged use of detergent, wash-up solution
9. Paper coating contaminates ink train

### **Solution:**

1. Adjust concentration of alcohol/alcohol substitute in fountain solution; consult ink manufacturer to reformulate ink with non-bleeding pigment
2. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
3. Adjust to proper ink/water balance
4. Adjust pressure to manufacturer specifications
5. Adjust dampener and ink rollers to manufacturer specifications; check durometer of rollers and replace if necessary
6. Make sure ink is on-standard; consult ink manufacturer to reformulate if necessary
7. a) Replace plates if necessary, b) adjust plate making process, and c) store plates away from moisture and humidity
8. Wash-up, remove detergent with water or petroleum solvent, and change solution
9. Use low-tack ink, low water setting and low pressure setting

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## *Trapping*

**Problem:** Cannot achieve good coverage.

### **Cause:**

1. Tack of inks out of sequence
2. Improperly balanced ink strength
3. Improper ink viscosities
4. Hue error or gray balance not keyed to color separations
5. Unequal press stability of inks; succeeding inks tack up quicker than preceding inks
6. Additive in ink creates film, preventing subsequent inks from adhering
7. Improper ink/water balance
8. Poor ink transfer from blanket
9. Improper register
10. Process color prints do not match supplied proofs

### **Solution:**

1. Adjust inks to have progressively lower tack
2. Adjust inks to have progressively heavier film for optimum trap
3. Adjust inks to have progressively lower viscosity
4. Coordinate efforts between suppliers
5. Consult ink manufacturer
6. Consult ink manufacturer; see CRYSTALLIZATION
7. Adjust to proper ink/water balance
8. Consult blanket manufacturer; consult ink manufacturer
9. See REGISTER
10. See COLOR VARIATION

Ask about:

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