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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:	Solution:
1. Ink vehicle penetrates stock too quickly	1. Bind ink to paper with overprint varnish or sealing size
2. Insufficient drier in ink for particular stock	2. Consult ink manufacturer regarding new ink for particular stock
3. Stock too acidic	3. Change stock; consult ink manufacturer to reformulate ink for particular stock
4. Ink too strong (ink film too thin)	4. Consult ink manufacturer to weaken ink
5. Fountain solution pH too low	5. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
6. Ink film too soft; no hold-out	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:	Solution:
1. Substrate variation	1. Consult ink manufacturer to adjust hue and hold-out of ink; Consult substrate manufacturer to change stock
2. Process color prints do not match supplied proof	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. Special, spot color does not match proof	3. Consult ink manufacturer
4. Different Pantone® Color Formula Guides	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:	Solution:
1. Base ink film too high in hard waxes	1. Consult ink manufacturer to formulate succeeding ink for better lay
2. Delay between colors too long	2. Run succeeding colors more quickly (if imprinting is required, leave area blank so later colors are printed on plain paper)
3. Excessive use of spray powder on base colors	3. Wipe prints to remove excess powder
4. Dry ink forms hard film	4. Consult ink manufacturer to formulate succeeding ink with more solvent; heat sheets to improve adhesion
5. Base ink film contains too much drier	5. Consult ink manufacturer for new ink
6. Infra-red drier forms hard film	6. Reduce drying temperature

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Dot Gain / Plugging of Screen

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

Cause:	Solution:
1. Improper pressure setting between plates, blankets and rollers	1. Adjust to proper pressure setting
2. Ink body too long	2. Consult ink manufacturer for stiffer ink
3. Ink too water-receptive	3. Consult ink manufacturer
4. Piling	4. See PILING
5. Plate not sharp enough	5. Coordinate with cameraman and platemaker for sharper halftones, negatives, positives and plates
6. Poorly desensitized plate	6. Desensitize plate; replace if necessary
7. Poorly ground ink	7. Consult ink manufacturer
8. Insufficient fountain solution	8. Increase fountain solution to cover plates evenly; check for dirty dampener cover and replace if necessary
9. Excessive ink on roller train	9. Reduce ink; reduce fountain solution
10. Blankets or rollers too soft	10. Recondition blankets or rollers; replace if necessary
11. Improperly packed blankets	11. Adjust packing

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Drying

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

Cause:	Solution:
1. Ink taking up too much water	1. Adjust to proper ink/water balance; consult ink manufacturer
2. Ink film too thick	2. Adjust press settings to carry less ink; consult ink manufacturer
3. Uneven plate dampening	3. Clean dampeners thoroughly; check windows, vents and forced air systems to prevent drafts
4. Paper contains excessive water; non-absorbent stock	4. Change stock
5. Improper fountain solution pH/conductivity	5. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
6. Inappropriate ink for particular stock	6. Consult ink manufacturer
7. Insufficient air/oxygen circulation	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. Relative humidity too high	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:	Solution:
1. Poor job layout	1. Improve job layout
2. Ink film too thin	2. Consult ink manufacturer to weaken ink for heavier film
3. Ink too transparent	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:	Solution:
1. Dried ink particles	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. Roller particles	2. Recondition rollers and drums; replace if necessary
3. Dampener cover particles	3. Replace sleeves and rollers if necessary
4. Plate particles	4. Check plates for loose coatings or shavings; remove all coatings during processing
5. Foreign particles	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:	Solution:
1. Excessive fountain solution (seen as “orange peel effect”)	1. Adjust dampener setting to proper levels
2. Fountain solution too strong (seen as weak color)	2. Reduce fountain solution to pH level between 4.0 and 4.5
3. Fountain solution too weak (seen as poor ink lay or “orange peel effect”)	3. Increase fountain solution to pH level between 4.0 and 4.5
4. Improper dampening roller setting	4. Reset rollers: assure that dampener rollers are driven by the vibrator roller and not the plate cylinder
5. Improper ink form roller setting	5. Conduct ink stripe test to check for roller pressure; adjust if necessary
6. Improper ink fountain setting	6. Adjust ink at fountain to proper level: allow adequate time for adjustment to take effect
7. Ink too weak	7. Consult ink manufacturer
8. Ink taking up too much water	8. Consult ink manufacturer

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Mileage

Problem: Too few impressions per pound of ink.

Cause:	Solution:
1. Improper ink densities	1. Adjust to lower print densities while maintaining acceptable quality
2. Ink penetrates stock too quickly	2. Consult ink manufacturer for ink with more hold-out
3. Stock too absorbent	3. Consult paper manufacturer; change to less absorbent stock
4. Improper ink/water balance	4. Adjust to proper ink/water balance
5. Low pigmented inks	5. Consult ink manufacturer for ink with greater strength
6. Excessive waste on start-up	6. Improve start-up procedures
7. Improper job estimates	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:	Solution:
1. Excessive ink on rollers	1. Adjust press to carry less ink; consult ink manufacturer for stronger ink
2. Improper ink/water balance	2. Adjust to proper ink/water balance
3. Improperly set or worn rollers	3. Adjust rollers to proper setting; replace if necessary
4. Ink too long in body	4. Consult ink manufacturer

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Mottle

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

Cause:	Solution:
1. Non-uniform stock surface	1. Consult paper manufacturer to change stock; consult ink manufacturer for ink for less penetration, strength
2. Improper printing pressure	2. Adjust printing pressure
3. Improperly set or worn form rollers	3. Adjust rollers to proper setting; replace if necessary
4. Improper ink/water balance	4. Adjust to proper ink/water balance
5. Worn blanket	5. Replace blanket

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Muddy Halftones

Problem: Halftone appearance lacks sharpness in highlight areas.

Cause:	Solution:
1. Excessive ink on plate	1. Adjust press settings to carry less ink
2. Poor materials for reproduction	2. Check and improve reproduction process
3. Improperly processed plate	3. Check exposure of plates using Gray scale (Stouffer scale)
4. Improper form roller setting	4. Adjust setting to manufacturer's specifications
5. Improper ink/water balance	5. Adjust to proper ink/water balance
6. Excessive dot gain	6. Adjust for dot gain on press and/or plate; see DOT GAIN
7. Glazed blanket	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:	Solution:
1. Too much water reaching paper	1. Adjust to proper ink/water balance
2. Excessive lint, surface trash, coating dust on stock	2. Consult paper manufacturer
3. Base stock picks	3. Reject stock if necessary; change to more lint- or pick-resistant stock
4. Pressure too high for ink/stock combination	4. Adjust impression pressure and repack to manufacturer specifications
5. Blankets too tacky	5. a) Consult blanket manufacturer, b) Treat blanket or change to less tacky blanket, or c) Change blanket wash
6. Ink too tacky for stock	6. Consult ink manufacturer to adjust ink for less tack

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Piling

Problem: Build-up of ink on printing plates.

Cause:	Solution:
1. Paper problems	1. See PICKING/LINTING
2. Ink is waterlogged	2. Adjust dampener settings; consult ink manufacturer
3. Poorly ground ink contains coarse pigment	3. Consult ink manufacturer to rework ink
4. Improperly packed cylinders	4. Check specifications and adjust cylinders
5. Improperly set or worn rollers	5. Check specifications and adjust rollers; replace if necessary
6. Blankets too tacky	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:	Solution:
1. Fountain solution too acidic	1. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
2. Excessive gum in fountain solution	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. Plate cleaners and/or scratch removers have dried on plate image	3. Rinse plate well after cleaning
4. Fountain system contaminated by detergent	4. Thoroughly rinse all washed parts before re-installing in press
5. Excessive fountain solution in ink	5. Reduce dampener setting to minimum level; consult ink manufacturer
6. Improperly developed plates; gum adheres to image area	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:	Solution:
1. Improperly processed plates	1. Check for excess Diazo on plates; improve plate developing process using Gray scale (Stouffer scale)
2. Improperly set ink and/or water form rollers	2. Adjust setting to manufacturers' specifications
3. Excessive linting	3. See PICKING/LINTING
4. Improper concentration of fountain solution	4. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
5. Improperly packed plate and blanket cylinders	5. Adjust to manufacturer specifications using Colight or Baldwin gauge
6. Running plates beyond capabilities	6. Change to higher-quality plates for longer plate life
7. Inks much too strong	7. Reduce ink strength to improve lubrication
8. Poorly ground ink	8. Consult ink manufacturer to rework ink
9. Form rollers too hard	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:	Solution:
1. Improperly aligned press, plate, blanket, and substrate	1. Make adjustments as needed
2. Blanket swollen or embossed	2. Replace blanket
3. Poorly trimmed press sheets	3. Fan sheets
4. Static electricity on press sheets	4. Fan sheets
5. Image improperly aligned on plate	5. Check prepress area for film and vacuum problems

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Roller Stripping

Problem: Rollers do not accept ink.

Cause:	Solution:
1. Fountain solution too acidic	1. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
2. Excess water in press	2. Reduce dampener setting
3. Desensitized metal vibrator rollers	3. Clean, copperize rollers; use less gum in fountain solution
4. Glazed form roller	4. Remove rollers from press, de-glaze appropriately and rinse
5. Excessive gum in fountain solution	5. Re-copperize rollers; use less gum in fountain solution
6. Ink too strong	6. Consult ink manufacturer
7. Ink too water-resistant	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:	Solution:
1. Excessive water on press, in paper	1. Reduce dampener settings; change paper
2. Improper pH of fountain solution	2. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
3. Ink not fully dry	3. See DRYING
4. Rough paper surface creates poor rub between unprinted and printed surfaces	4. Consult ink manufacturer to reformulate ink with more rub resistance
5. Excessive ink	5. Adjust press settings to carry less ink; consult ink manufacturer
6. Ink formulation lacks rub resistance	6. Consult ink manufacturer
7. Insufficient binding vehicle in ink	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:	Solution:
1. Ink dries too slowly	1. See DRYING
2. Insufficient spray powder	2. Increase powder application
3. Lifts too heavy	3. Run shorter lifts; tray the lifts
4. Rough handling of loads	4. Do not drop or jerk loads

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Slurred / Double Image

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

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Cause:	Solution:
1. Improperly packed cylinders	1. Check specifications and adjust cylinders
2. Loose, uneven or soft blanket	2. Tighten blanket clamps; adjust packing or replace blanket if necessary
3. Excessive play in gears and bearings of plate and blanket cylinders	3. Adjust to manufacturers' specifications
4. Excessive plate-to-blanket pressure	4. Use "kiss" impression; check form roller stripe for uniformity and width
5. Excessive ink on coated stock	5. Adjust press to carry less ink; adjust water accordingly

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Slurred / Double Image

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

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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:	Solution:
1. Ink bleeds into fountain solution	1. Adjust concentration of alcohol/alcohol substitute in fountain solution; consult ink manufacturer to reformulate ink with non-bleeding pigment
2. Improper concentration of fountain solution	2. Adjust fountain solution to proper pH/conductivity (pH 4.0-4.5)
3. Improper ink/water balance	3. Adjust to proper ink/water balance
4. Pressure between plate and blanket too high	4. Adjust pressure to manufacturer specifications
5. Improper setting or durometer of dampener or ink rollers	5. Adjust dampener and ink rollers to manufacturer specifications; check durometer of rollers and replace if necessary
6. Ink insufficiently resistant to water	6. Make sure ink is on-standard; consult ink manufacturer to reformulate if necessary
7. Improperly exposed or developed plates	7. a) Replace plates if necessary, b) adjust plate making process, and c) store plates away from moisture and humidity
8. Prolonged use of detergent, wash-up solution	8. Wash-up, remove detergent with water or petroleum solvent, and change solution
9. Paper coating contaminates ink train	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

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