- Adhesion
- ▶ Bleed
- Blushing (Hazing, Fogging)
- ► Color Too Strong
- Color Variations
   Among Same Color
   Jobs Being Run In A
   Plant
- **▶** Dirty Printing
- Excessive Ink Consumption

- Fill-in of Reverses and Type
- ► Float on Ink
- Foaming
- Ghosting
- ► Halo Around Print
- Kick-out
- Mottle
- Pinholes or Fisheyes

- Screening
- Set-off and/or Blocking
- Settling of Ink
- ► Sheet Feeding Problem
- Smearing
- Striations
- ▶ Tracking
- Trapping
- Weak Color

#### Ask about:

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



### Adhesion

Problem: Ink flakes off substrate, comes off when crinkled, or is removed easily in tape test.

#### Cause:

- 1. Viscosity too high
- 2. Viscosity too low
- 3. Ink surface tension too high
- 4. Incorrect ink system for substrate

7. Substrate surface contamination

8. Insufficient web temperature

- 5. Poor film treatment
- 6. Ink drying too slow

#### Ask about:

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

#### **HOME**

### **Solution:**

- 1. Reduce viscosity consistent with acceptable printability
- 2. Add virgin ink to fountain
- 3. Consult your technical sales representative
- 4. Ensure that the correct ink for the substrate is being used
- 5. Check surface of film for adequate treatment; treat in-line, if possible
- 6. Check driers for heat and airflow; consult your ink manufacturer
  - **Solvent Flexo**: Reduce with faster solvent blend
- 7. Check with film supplier as to advisability of applying a primer before printing, use in-line treater
- 8. Increase temperature settings of driers, check drier balance



### **Bleed**

Problem: Color spreads into subsequently applied coating or adhesive.

#### Cause:

- 1. Improper pigment use in ink formulation
- 2. Coating or adhesive may be rewetting the dried ink

### Solution:

- 1. Consult your ink manufacturer to reformulate using resistant pigment
- 2. Consult your ink manufacturer to reformulate using resistant pigment

### Ask about:

- ► Flexography
- ► Pub Gravure
- ► Pkg Gravure
- ► Sheetfed Offset
- **►** UV
- ► Web Offset
- ► News Ink



### Blushing (Hazing, Fogging)

Problem: Milky, foggy or matte appearance in an ink or coating.

#### Cause:

- Solvent Flexo: High humidity causing excess moisture build-up in ink
- 2. Solvent Flexo: Moisture condensation on surface of drying ink

#### Solution:

- Solvent Flexo: Consult your ink manufacturer for properly balanced solvent blend for specific ink and printing conditions
- 2. Solvent Flexo: Use less hygroscopic solvent blend for ink reduction; coordinate with your ink manufacturer

### Ask about:

- ► Flexography
- ► Pub Gravure
- ► Pkg Gravure
- ► Sheetfed Offset
- **UV**
- ► Web Offset
- ► News Ink



### **Color Too Strong**

Problem: Visual color different from standard.

#### Cause:

- 1. Solvent Flexo: Ink viscosity too high
  - Water Flexo: Ink pH too high
- 2. Ink pigmentation too high
- 3. Inappropriate anilox roll; cell volume too great or cell count too low
- 4. Inadequate pressure setting on impression roll
- 5. Plate and/or ink metering roll durometer too low
- 6. Inadequate impression on doctor blade

### Solution:

- Solvent Flexo: Reduce viscosity to proper level with recommended solvent blend
   Water Flexo: Check and adjust pH then reduce viscosity to proper level
- 2. Reduce ink colorant strength with balanced extender
- 3. Replace anilox roller with one of higher line count and/or lower volume capacity
- 4. Adjust impression for optimum printability
- 5. Consult plate and/or roller manufacturer
- Adjust doctor blade to recommended pressure

### Ask about:

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



# Color Variations Among Same Color Jobs Being Run in a Plant

#### Cause:

1. Poor viscosity control

Water Flexo: Lack of pH control

- 2. Variation in substrate porosity or surface treatment
- 3. Previously used ink
- 4. Inadequate amount of ink in fountain or doctor blade chamber
- 5. Different suppliers of same color
- 6. Variation in ink batches
- 7. Non-standard process design

#### Ask about:

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

#### **HOME**

### Solution:

Establish set procedures for viscosity control

Water Flexo: Maintain proper pH

- 2. Consult with ink and substrate manufacturers for proper measures to be taken
- 3. Replace or add virgin ink
- Add ink to fountain or ensure adequate ink pressure into enclosed doctor blade assembly
- 5. Run only one supplier's ink on a given color
- 6. Consult your ink manufacturer
- 7. Inks must be modified to matched print station; recommend match visual standard on-site



### **Dirty Printing**

Problem: Fuzzy extensions of image into non-image area. Impression increase or change in plate durometer during run. Recovers when taken off press; sometimes results in cracks in plate during storage.

#### Cause:

- 1. Excess ink being applied to plate
- 2. Excess impression between plate and substrate
- 3. Ink viscosity too high
- 4. Accumulation of paper dust (lint)
- 5. Ink drying too fast
- **6. Water Flexo**: Ink pH too low
- 7. Excessive anilox volume
- 8. Excess anilox impression
- Plate swell caused by use of materials not compatible with printing plates

### Solution:

- Adjust anilox/fountain roller impression; adjust doctor blade pressure
- 2. Reduce to "kiss" impression for type and minimize impression consistent with acceptable printability for reverses
- 3. Adjust to lowest viscosity consistent with acceptable printability
- 4. Improve housekeeping, vacuum paper dust and filter ink
- 5. Check air flow at between-deck driers; consult your technical service representative

**Solvent Flexo**: Use slower solvent blend to reduce ink

- **6. Water Flexo**: Raise pH as instructed to by ink manufacturer
- 7. Use lower volume anilox
- 8. Back off impression of anilox to plate
- 9. Confer with plate and ink suppliers



### Ask about:

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

### **Excessive Ink Consumption**

Problem: Too few impressions per pound of ink.

#### Cause:

- 1. Ink viscosity too high
- 2. Ink color acceptable, but stronger than standard
- 3. Weak ink
- 4. Excessive anilox volume
- 5. 2 Roll: Soft metering roller
- Excess loss on start up or shutdown

### Solution:

- Reduce ink to lowest viscosity consistent with acceptable printability
- Use balanced extender to weaken color to the middle of the acceptable range
- 3. Check ink for strength vs. original standard
- 4. Finer/shallower anilox
- 5. Check durometer; extend or reduce ink
- Additional care in ink handling; can be due to large amount of ink required for inking station

### Ask about:

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



### Fill-in of Reverses and Type

Problem: Ink bridges across small print and non-printing gaps in design.

#### Cause:

- 1. Excess ink being applied to plate
- 2. Excess impression between plate and substrate
- 3. Ink viscosity too high
- 4. Accumulation of paper dust (lint)

**6. Water Flexo**: Ink pH too low

7. Excessive anilox volume

5. Ink drying too fast

#### Ask about:

- Flexography
- Pub Gravure
- Pkg Gravure
- ► Sheetfed Offset
- **►** UV
- ► Web Offset
- News Ink

#### HOME

### **Solution:**

- Adjust anilox/fountain roller impression; adjust doctor blade pressure
- 2. Reduce to "kiss" impression for type and minimize impression consistent with acceptable printability for reverses
- 3. Adjust to lowest viscosity consistent with acceptable printability
- 4. Improve housekeeping, vacuum paper dust and filter ink
- 5. Check air flow at between-deck driers. Consult your ink manufacturer

**Solvent Flexo**: Use slower solvent blend to reduce ink

- **6. Water Flexo**: Raise pH as instructed by ink manufacturer
- 7. Use lower volume anilox



### Float on Ink

Problem: Non uniform layer on surface of ink in container may result in a variety of print defects as container is used.

#### Cause:

1. Non-compatible additive that is less dense than ink

### Solution:

Mix and keep mixing while using.
 Agitation in sump may be required in severe cases

### Ask about:

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

**HOME** 

**NOTE:** All inks should be mixed before use as a general practice.



### **Foaming**

Problem: Voids in printing, foam visible in sumps, or ink overflowing sump.

#### Cause:

- Too much air being introduced into ink
- 2. Ink level in fountain below pump intake level
- 3. Ink falls excessive distance when recycled into reservoir
- 4. Ink viscosity too high
- 5. Improperly formulated ink
- **6. Water Flexo**: Poor cleanup procedures

### Solution:

- Check for leaks in hoses and pumps.
   Adjust pump speed to reduce agitation
- 2. Fill fountain with ink well above intake level
- 3. Use hose or pipe to eliminate long ink falls into pan
- 4. Reduce viscosity to allow any bubbles to rise and break at surface
- 5. Consult your ink manufacturer
- **6. Water Flexo**: Ensure that no detergent from clean-up has contaminated ink

#### Ask about:

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

### **Ghosting**

Problem: Part of image not printing; resembles an offset of same image. (See also *Tracking*)

#### Cause:

 Ink dries too fast for anilox volume, does not adequately replenish anilox

### Solution:

- 1. Slow ink down
  - Add extender
  - Use coarser anilox
  - Reduce press speed

### Ask about:

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



### **Halo Around Print**

Problem: Area just inside of printed image with light or no ink; often accompanied by dirty printing.

#### Cause:

 Improper pressure settings on impression

### Solution:

 Adjust to as close to "kiss" impression as possible, consistent with acceptable printability

### Ask about:

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



### Kick-out

Problem: Coagulated ink, lumps or particles in ink.

#### Cause:

- **1. Solvent Flexo**: Incorrect solvent balance during viscosity reduction
- 2. Solvent Flexo: High humidity causing excess moisture build-up in ink
- 3. Water Flexo: Drop in pH.
- 4. Mixing incompatible inks

#### Solution:

- Solvent Flexo: Consult with your ink manufacturer for properly balanced solvent blend for specific ink and printing conditions
- Solvent Flexo: Use less hygroscopic solvent blend for ink reduction.
   Coordinate this with your ink manufacturer
- **3. Water Flexo**: Adjust pH to proper level with amine solution. Consult your ink manufacturer
- 4. Do not mix inks from different vendors or water inks with solvent inks

### Ask about:

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



### Mottle

Problem: Random light and dark spots. May cause color to appear dirty.

#### Cause:

- 1. Substrate has non-uniform caliper or absorption characteristics
- 2. Ink viscosity too low
- Improper impression. Can be caused by uneven plates, surface dirt on plates or dirty impression cylinder
- 4. Non-optimal plate selection
- 5. Contaminated plates
- 6. Transparent color

### Solution:

- Try lower durometer plate; try opaque ink
- 2. Add fresh ink and maintain proper viscosity
- Clean plates and impression cylinder; adjust impression; check and adjust plate cushion or mounting materials; remake plates
- 4. Consult plate manufacturer
- 5. Wash plates with appropriate solvent or replace plate if cannot be cleaned
- 6. Transparent color does not cause problem, but increasing opacity of the color match may mask the problem

### Ask about:

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



### Pinholes or Fisheyes

Problem: Tiny round voids in printed image. Sometimes confused with screening.

Slide 1 of 2

#### Cause:

- 1. Ink drying too fast
- 2. Low or uneven treatment level on film
- 3. Excessive foam
- **4. Solvent Flexo**: Contaminated film surface

#### Solution:

- 1. Check air flow at between-deck driers; consult your ink manufacturer
- 2. Check film treatment; re-treat or treat in-line if possible
- 3. See FOAMING
- 4. Solvent Flexo: Check with film supplier about applying a wash coat before printing; replace with roll of film from different lot

Ask about:

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

HOME

**NOTE:** Pinholes generally pertain to unwetted substrates. Fisheyes are areas where ink has pulled back, leaving uninked or light areas.



### Pinholes or Fisheyes, continued

Problem: Tiny round voids in printed image. Sometimes confused with screening.

Slide 2 of 2

#### Cause:

- **5. Solvent Flexo**: Contamination from poor clean-up of fountain, rollers, etc.
- **6. Solvent Flexo**: Excess "slip agent" in ink
- Solvent Flexo: Incorrect ink for substrate being printed
- **8. Water Flexo**: Excessive defoamer in ink
- Water Flexo: Ink surface tension too high

### Solution:

- 5. Solvent Flexo: Empty fountain, properly dispose of contaminated ink, clean fountain and all rollers properly, and start job with fresh ink
- 6. Solvent Flexo: Clean up as described in number 5 above and start up with ink from a different lot; consult your ink manufacturer
- Solvent Flexo: Consult your ink manufacturer
- 8. Water Flexo: Add fresh ink to fountain or replace all ink in fountain with fresh ink
- **9. Water Flexo**: Consult your ink manufacturer for recommendation

### Ask about:

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



### Screening

Problem: Small voids printed in image area. Often has very regular shape consistent with anilox pattern.

#### Cause:

- 1. Ink drying too fast on anilox roll
- 2. Inadequate inking of anilox (starvation)
- 3. Similar appearance can be caused by plates or backing

#### Solution:

- Consult ink manufacturer
   Solvent Flexo: Reduce with slower solvent blend
- 2. Slow down press, increase ink flow, or slow return to increase ink level in fountain
- 3. Consult ink manufacturer or plate manufacturer

### Ask about:

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



### Set-off and/or Blocking

Problem: Ink transfers from image side to back side of substrate when unrolled; inability to separate printed sheets or to unroll web.

#### Cause:

- 1. Drying too slow
- 2. Excess pressure in re-wound roll
- 3. Film substrate treated on both sides
- 4. Film substrate heavily plasticized
- 5. Web too warm when rewound
- 6. Web rewound with too much surface moisture
- **7. Solvent Flexo**: Trapped solvent in printed ink film
- **8. Water Flexo**: Trapped amine in printed ink film

#### Ask about:

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

#### **HOME**

### Solution:

- Check driers for heat and air flow; reduce ink viscosity consistent with acceptable printability; consult your ink manufacturer
- 2. Reduce rewind tension
- 3. Avoid excessive pressure in rewind; apply offset powder to web prior to rewind; overprint with non-blocking clear varnish, if necessary
- 4. Avoid excessive pressure in rewind; apply offset powder to web prior to rewind; overprint with non-blocking clear varnish; consult your ink manufacturer for different ink
- 5. Reduce web temperature by chilling within 10° F of ambient temperature
- 6. Avoid over chilling which allows condensation to form on film surface

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- **7. Solvent Flexo**: Check driers for heat and airflow; consult your ink manufacturer
- **8. Water Flexo**: Check driers for heat and airflow; consult your ink manufacturer

### Settling of Ink

Problem: Thick or particulate material in bottom of sumps, pans or ink containers.

#### Cause:

- 1. Old ink
- 2. Press return at lower viscosity
- 3. Improper ink formulation
- 4. Some specialty inks may settle due to the high specific gravity of the pigment.

### Solution:

- 1. Rotate inventory
- 2. Mix, then combine with virgin ink prior to use
- 3. Consult your ink manufacturer
- 4. Add agitation to the ink sump

#### Ask about:

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



### Sheet Feeding Problem

Problem: Slipping in delivery belts causing frequent jams in subsequent operations or on sheetfed presses.

#### Cause:

- 1. Ink build-up on delivery belt
- 2. Worn belts
- 3. Mechanical problems
- 4. Inappropriate ink formulation

#### Solution:

- 1. Clean belts
- 2. Replace belts
- Ensure all tensions, pressures and other mechanical adjustments are correct
- 4. Consult your ink manufacturer

### Ask about:

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



### **Smearing**

Problem: Ink smeared into non-image area by surface contact down-line on the printing press.

#### Cause:

- 1. Too much ink
- 2. Too little drying
- 3. Rewetting by adhesive or coating
- 4. Mechanical speed mismatch

### Solution:

- 1. Use a lower volume anilox, increase nip pressure (2 roll), lower viscosity
- 2. Increase dry capacity, slow down press, use faster reducer
- 3. Change ink, coating reducer or formulation
- 4. Adjust combination of plate, mounting tape and gearing

### Ask about:

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



### **Striations**

Problem: Lines of weak ink or no ink in direction of print run.

#### Cause:

- 1. Ink film too thin due to worn or plugged anilox roller, high durometer plate or too-low viscosity
- Improper pressure setting on impression cylinder and/or anilox roller due to uneven plates or substrate
- 3. Defects in anilox, plate or fountain roll
- 4. Ink too transparent

### Solution:

- Clean or replace anilox roller; remake plate; check and adjust pH and viscosity
- 2. Adjust impression to as near "kiss" as possible.
- 3. Replace or repair defective component; investigate cause to avoid recurrence
- 4. Transparent color does not cause problem, but increasing opacity of the color match may mask the problem

#### Ask about:

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

### **Tracking**

Problem: Ink appears in area where there is no print. (See *Ghosting*)

#### Cause:

1. Ink film too heavy

2. Ink drying too slow

3. Mechanical problems

4. Difficult design due to extreme

and/or die cut positioning

color coverage, degree of trapping

### Ask about:

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

### HOME

### **Solution:**

- Reduce viscosity consistent with acceptable color and printability; have ink reformulated for stronger color to permit thinner film; adjust to proper pressure at all roller nips
- 2. Solvent Flexo: Adjust ink drying speed with supplier-recommended solvent blend
  - Water Flexo: Adjust ink drying speed based on instructions from supplier
- 3. Adjust and clean all belt and idler roller surfaces that are in contact with the printed substrate
- 4. Change layout of design and/or consult your ink manufacturer



### **Trapping**

Problem: Cannot achieve good coverage in areas where more than one color is applied.

### Cause:

- 1. First-down color drying too slow
- 2. Subsequent colors drying too fast
- 3. Improper pressure setting on impression cylinder
- 4. Water Flexo: Improper viscosity
- 5. Incorrect plate or backing

### Ask about:

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

#### **HOME**

### **Solution:**

- Consult your ink manufacturer; check drier capacity; Solvent Flexo: Use faster-drying reducing solvent
- Check air flow in between-color driers.
   Consult your ink manufacturer; Solvent
   Flexo: Use slower drying reducing solvent
- 3. Adjust impression on first- and second-down inks
- Water Flexo: In general, each succeeding color requires slightly higher viscosity; adjust accordingly
- 5. Use optimal plate, firmer backing



### Weak Color

Problem: Visual color different from standard.

Slide 1 of 2

#### Cause:

1. Ink viscosity too low

#### Solvent/Water Flexo:

- a. Too much solvent added to cut ink
- b. Excess clean-up solvent in system

Water Flexo: pH too low

- 2. Worn anilox roller
- 3. Plugged anilox roller

4. Plate durometer too high

#### Ask about:

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

HOME

### **Solution:**

1. Replace ink totally or add virgin ink to fountain

- 2. Consult anilox roller manufacturer to verify; replace if necessary
- Use brass bristled brush for chrome rollers; stainless steel bristled brush for ceramic rollers
   Solvent Flexo: Clean with recommended solvent to remove dry ink from cells
   Water Flexo: Clean with brush, hot water (140° F) and detergent to remove dry ink from cells
- 4. Remake plates to proper specifications and replace

continued...



### Weak Color, continued

Problem: Visual color different from standard.

Slide 2 of 2

#### Cause:

- 5. Improper pressure setting on impression and/or anilox roller
- 6. Ink too weak for anilox roller volume
- 7. Inadequate ink in fountain or in doctor blade chamber
- 8. Solvent Flexo: Dirty plates

**9. Water Flexo**: Glazed or dirty

10. Water Flexo: Glazed metering roll

plates

#### Ask about:

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

#### Solution:

- 5. Re-adjust impression for optimum printability
- 6. Consult your ink manufacturer to strengthen ink if at all possible. If this is not possible, replace anilox roller with one having a deeper etch
- 7. Add ink to fountain or ensure adequate ink pressure into enclosed doctor blade assembly
- **8. Solvent Flexo**: Wash plates with recommended solvent and, if necessary, a moderately stiff non-metallic brush
- 9. Water Flexo: Wash plates with warm water, a mild detergent and a moderately stiff nonmetallic brush
- 10. Water Flexo: Wash with warm water, a mild detergent and a moderately stiff non-metallic brush

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