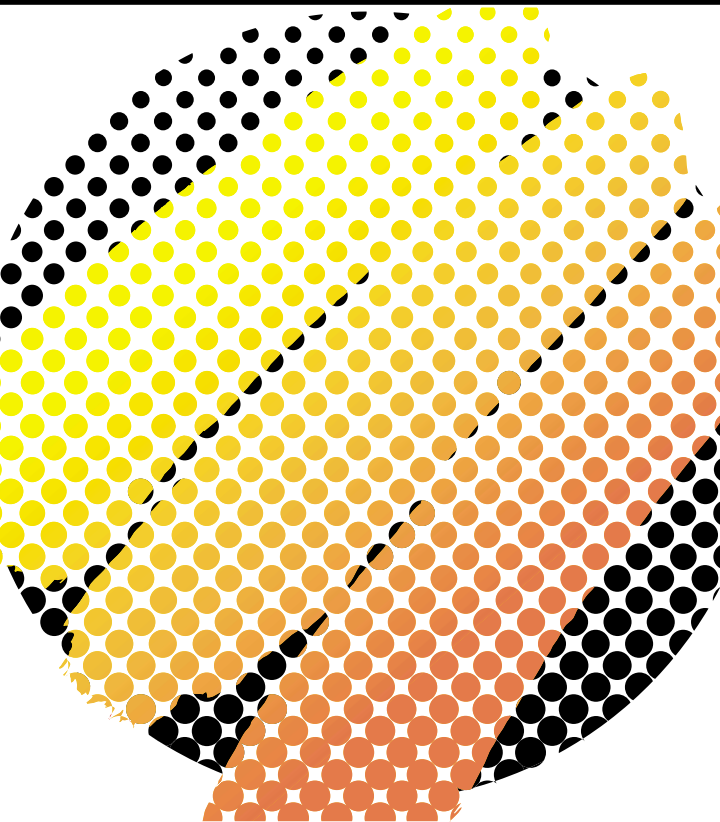
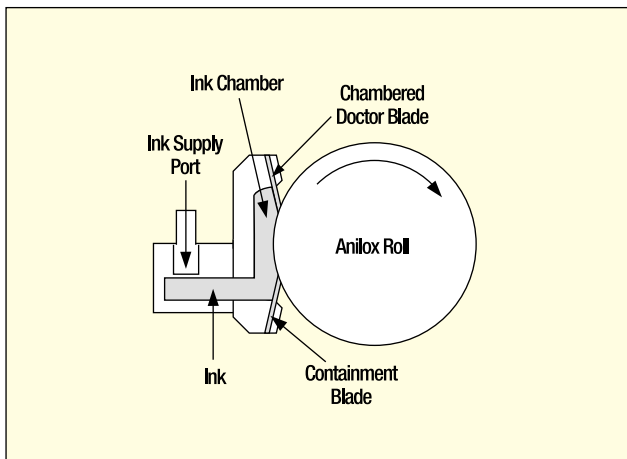


TROUBLESHOOTING GUIDE

FLEXOGRAPHIC INKS



SunChemical



Even under the best circumstances, there will be times when things go wrong on a flexographic press. And when you encounter such problems in your printing process, we encourage you to refer to the material presented in this troubleshooting guide. You will be able to find an easy solution to most any problem right here in these pages. But if there is an unusual situation that we haven't covered in this guide, then we are still here to help. Take advantage of our experience and the largest commitment to research and development in the printing ink and coating industry. We are your source for comprehensive ink management.

Bright
in ink management
ideas™

SunChemical™

TABLE OF CONTENTS

Flexographic Troubleshooting Guide

Adhesion.....	3
Blocking/offset.....	4
Dirty printing/dot bridging	5
Dirty printing/feathering	6
Dirty printing/halos.....	7
Donuts in tone screens.....	8
Fill-in.....	9
Ink smearing/bleed	10
Mottle	11
Pinholing.....	12
Poor ink trap	13
Weak color print.....	14

FLEXOGRAPHIC INKS

ADHESION – Ink and/or top lacquer do not bind to each other or to substrate. Ink lifts off with 3M brand #610 Scotch tape.



PROBLEM**SOLUTION**

- | | |
|--|--|
| 1. Surface is not ink or lacquer receptive. | 1. Treat substrate if treatable, but do not over-treat; change to recommended ink type; and/or use coating primer if possible. |
| 2. Ink is not drying properly. | 2. Add faster drying solvents and/or increase air and heat delivery. Thin inks if possible. |
| 3. Ink is brittle due to insufficient amount of plasticizer. | 3. Add small amount of plasticizer. |
| 4. Ink choice is improper for substrate. | 4. Reformulate ink for specific substrate. |
| 5. Ink viscosity is too high. | 5. Reduce ink viscosity to proper level. |
| 6. Web temperature is too low for substrate and ink. | 6. Increase web temperature to adequate level for substrate and ink. |

FLEXOGRAPHIC INKS

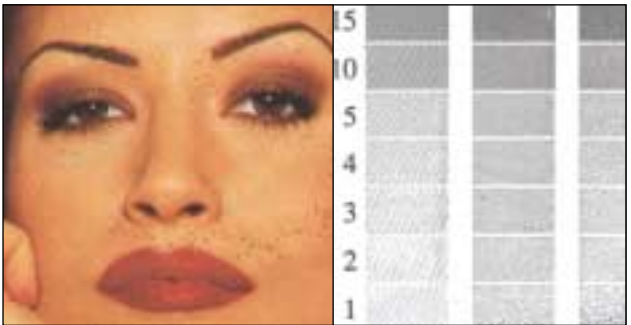
BLOCKING/OFFSET – Undesired adhesion between surfaces. Ink is sticking to reverse side of print when rewound or bundled.



PROBLEM	SOLUTION
1. Ink is not drying properly.	1. Add faster drying solvents and/or increase air delivery.
2. Solvents are trapped.	2. Add faster drying solvents and/or increase air delivery. Also check for ink skinning.
3. Web is rewound too warm.	3. Reduce chill roll temperature.
4. Rewind pressure on web is excessive.	4. Reduce web tension.
5. Ink or varnish are over-plasticized.	5. Remake ink or varnish. Add anti-block agent.
6. Ink or top lacquer is soft or has a low melting point.	6. Remake ink or lacquer.
7. Web temperature is too low.	7. Increase web temperature.
8. Moisture condensation appears on chill roll.	8. Check and reset chill roll temperature above dew point.

FLEXOGRAPHIC INKS

DIRTY PRINTING/DOT BRIDGING – Appearance of a dirty, grainy effect as a result of two or more process dots linking together. The gaps between dots are bridged by ink. Fly-specks also appear in the process areas.

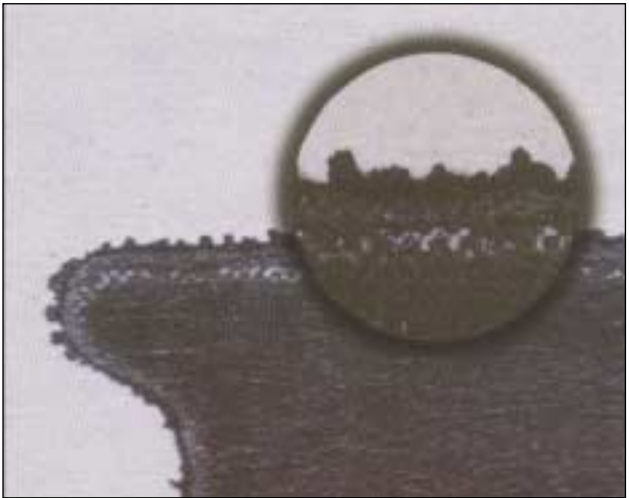


PROBLEM**SOLUTION**

- | | |
|--|--|
| 1. Anilox volume is too deep for dot size and an excessive amount of ink is metering to the plate. | 1. Reduce anilox volume or increase plate dot size. |
| 2. Ink is flooding plate dots due to loose ink metering or worn doctor blades. | 2. Check and adjust ink metering; check and replace doctor blade if indicated. |
| 3. Stray air is blowing on plate or anilox. | 3. Block stray air; balance dryers to eliminate "blow-down" on plates. |
| 4. Plate impression or plate relief is excessive. | 4. Reset plate impression. Eliminate high spots if bridging is localized. |
| 5. Ink is drying too fast. | 5. Add slower drying solvents. |

FLEXOGRAPHIC INKS

DIRTY PRINTING/FEATHERING – Ink is drying on plates and/or anilox rolls, is printing screen patterns, and/or is drying along plate edges and type edges resulting in a ragged, feathery appearance.



PROBLEM**SOLUTION**

- | | |
|---|--|
| 1. Impression between plate and substrate is excessive. | 1. Reset plate pressure to “kiss” impression. |
| 2. Water-based ink pH is too low. | 2. Increase water-based ink pH. |
| 3. Ink is flooding due to high anilox volume. | 3. Reduce anilox volume. |
| 4. Ink is drying too fast. | 4. Check ink formulation; add slower drying solvents. |
| 5. Air hitting plates or anilox roll is excessive. | 5. Block stray air; balance dryers to eliminate “blow-down” on plates. |
| 6. Ink viscosity is too high. | 6. Reduce ink viscosity. |
| 7. Dust or lint is picked up from substrate. | 7. Check to be sure ink filters are working; filter ink; change substrates or use web scrubbers. |

FLEXOGRAPHIC INKS

DIRTY PRINTING/HALOS – An undesirable outline appears around the printed image or type.

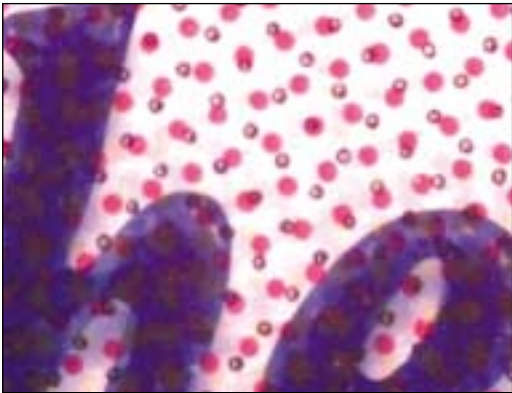


PROBLEM**SOLUTION**

-
- | | |
|---|---|
| 1. Pressure between plate and substrate is excessive. | 1. Reset plate pressure to "kiss" impression. |
| 2. Plate or stickyback tape is too hard. | 2. Use plate with softer durometer; switch to a cushion stickyback tape. |
| 3. Edges are cupped on plate. | 3. Check plate and replace if necessary. |
| 4. Plate cylinder is out of round causing intermittent halos. | 4. Check run-out of plate cylinder and anilox roll; replace plate and/or anilox roll. |
-

FLEXOGRAPHIC INKS

DONUTS IN TONE SCREENS – Appearance of dots that only print on the circumference of the cells with a void in the center. Due to slur, dots may also appear elongated or oval-shaped with center voids.

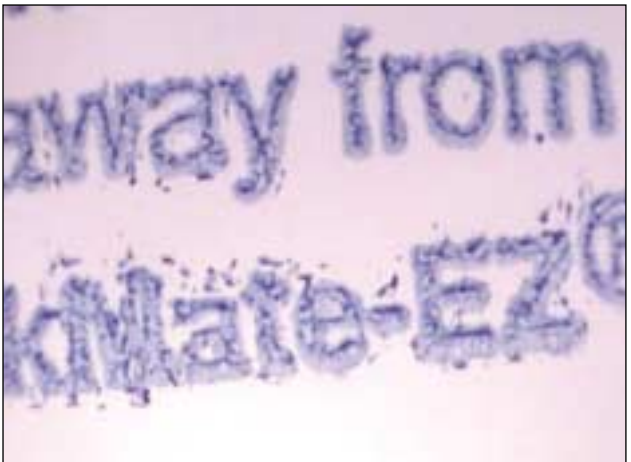


PROBLEM**SOLUTION**

- | | |
|---|---|
| 1. Print impression is excessive. | 1. Reset plate pressure to "kiss" impression. |
| 2. Stickyback tape is too hard. | 2. Avoid hard tapes; switch to a cushion stickyback tape. |
| 3. Ink is drying too fast and is too tacky. | 3. Add slower drying solvents to reduce tack. Tacky inks will usually show stringing from dots. |
| 4. Ink film is too thin and is not hitting dots sufficiently. | 4. Check viscosity and ink metering; adjust for optimum amount of ink on plate. |
| 5. Plates are hard and over-exposed. | 5. Use plate with softer durometer. |

FLEXOGRAPHIC INKS

FILL-IN – Printed type and designs are very ragged. Letters such as "A's", "O's", and "P's" are filled-in and poorly defined. Overall appearance is dirty.



PROBLEM**SOLUTION**

1. Print impression is excessive.	1. Reset plate pressure to "kiss" impression.
2. Water-based ink pH is too low.	2. Increase water-based ink pH.
3. Ink is drying too fast.	3. Add slower drying solvents to reduce tack. Tacky inks will usually show stringing from type edges.
4. Plates are worn, uneven, cupped or poorly made.	4. Check plates and replace if necessary.
5. Ink viscosity is too high.	5. Reduce ink viscosity.
6. Plate relief height is incorrect.	6. Adjust plate relief to correct height range.
7. Foreign matter appears in ink.	7. Filter or replace ink; eliminate source of contamination.

FLEXOGRAPHIC INKS

INK SMEARING/BLEED – Appearance of ink transfer or bleed of one color into another. Single color smears on contact.



PROBLEM**SOLUTION**

-
- | | |
|---|---|
| 1. First down ink is not fully dry. | 1. Increase drying speed of ink by:
a) Reducing ink viscosity.
b) Reducing ink thickness by changing metering conditions.
c) Adding faster drying solvent.
d) Adjusting air balance and heat. |
| 2. Second down ink, top lacquer or adhesive is too rich causing first down ink to dissolve. | 2. Check second down material and reformulate for non-aggressive properties. Consult your Sun Chemical representative for a more resistant first down ink. |
| 3. Foreign object is dragging on wet print. | 3. Trace web and remove dragging object. |
-

FLEXOGRAPHIC INKS

MOTTLE – An uneven appearance usually in areas of heavy ink coverage characterized by small light and dark inconsistencies in the ink film. Print is not smooth and uniform.



PROBLEM**SOLUTION**

1. Substrate is poor or marginally treated.	1. Check and adjust treatment level or change stocks.
2. Surface of substrate has holes.	2. Check substrate and reduce ink viscosity for better wetting. Consult your substrate supplier.
3. Surface tension of ink is not low enough to properly flow out on substrate. (Seen mostly in aqueous inks.)	3. Reduce surface tension of inks by adding wetting agents.
4. Impression between plate and substrate is too low.	4. Increase plate impression and check print appearance.
5. Stickyback tape is too soft.	5. Use hard tape for solid print areas when possible.
6. Ink viscosity is too low.	6. Increase ink viscosity.

FLEXOGRAPHIC INKS

PINHOLING – Appearance of small holes or voids in the print area; usually more visible in solid print areas. Ink fails to form a smooth, continuous film.



PROBLEM**SOLUTION**

- | | |
|---|--|
| 1. Substrate is poor or marginally treated. | 1. Check and adjust treatment level or change stocks. |
| 2. Surface of substrate has holes. | 2. Check substrate and reduce ink viscosity for better wetting. Consult your substrate supplier. |
| 3. Surface tension of ink is not low enough to properly flow out on substrate. (Seen mostly in aqueous inks.) | 3. Reduce surface tension of inks by adding wetting agents. |
| 4. Impression between plate and substrate is too low. | 4. Increase plate impression and check print appearance. |
| 5. Stickyback tape is too soft. | 5. Use hard tape for solid print areas when possible. |
| 6. Ink is drying too fast. | 6. Add slower drying solvents. |
| 7. Dried ink, dirt or rust is on impression cylinder. | 7. Check and clean cylinder/drum. |
| 8. Use of defoamer in water inks is excessive. | 8. Add fresh ink or check formula and reformulate ink. |

FLEXOGRAPHIC INKS

POOR INK TRAP – Print appearance of second down color over first down color is poor. Print mottles over first down ink. Ink coverage is not smooth in trap areas.



PROBLEM**SOLUTION**

-
- | | |
|---|---|
| 1. First down color is not fully dry. | 1. Increase drying speed of first down ink by:
a) Reducing ink viscosity.
b) Reducing ink film thickness by using shallower anilox volume.
c) Adding faster drying solvents.
d) Increasing dryer temperature and air velocity in dryer. |
| 2. Second down ink is drying too fast and not printing. | 2. Check and eliminate air blowing on plates; add slower drying solvents. |
| 3. Wax or slip-aid in first down ink is excessive. | 3. Check formula and remake ink if necessary. |
| 4. Second down ink is not compatible with first down ink. | 4. Consult your Sun Chemical representative for proper ink type. |
-

FLEXOGRAPHIC INKS

WEAK COLOR PRINT – Print fails to meet desired color strength or density.



PROBLEM	SOLUTION
1. Ink viscosity is too low.	1. Increase ink viscosity.
2. Anilox volume is too low.	2. Increase anilox to proper volume.
3. Stickyback tape is too soft.	3. Use harder tape for line work to achieve good ink transfer.
4. Ink is over-extended.	4. Check formula and add fresh ink.
5. Ink formulation is too weak.	5. Check raw ink formula for proper strength; check to see if ink is re-work and has proper strength.
6. Substrate is not receptive to ink.	6. Check substrate surface; check for proper film treatment.
7. Ink is drying on plates or anilox.	7. Eliminate any excess air blowing on plates and anilox; add slower drying solvents.
8. Ink is kicking-out or settling.	8. Make sure ink is properly mixed, with no settling on bottom or signs of ink separation.

Bright
in ink management
ideas™



SunChemical®

The information contained in this document is general in nature only, and is provided without representation or warranty of any kind. Sun Chemical's products are provided subject to standard terms and conditions. Sun Chemical recommends consultation with its technical experts and trials before general use of any product.

See *this troubleshooting guide on-line at www.sunchemicalink.com.*