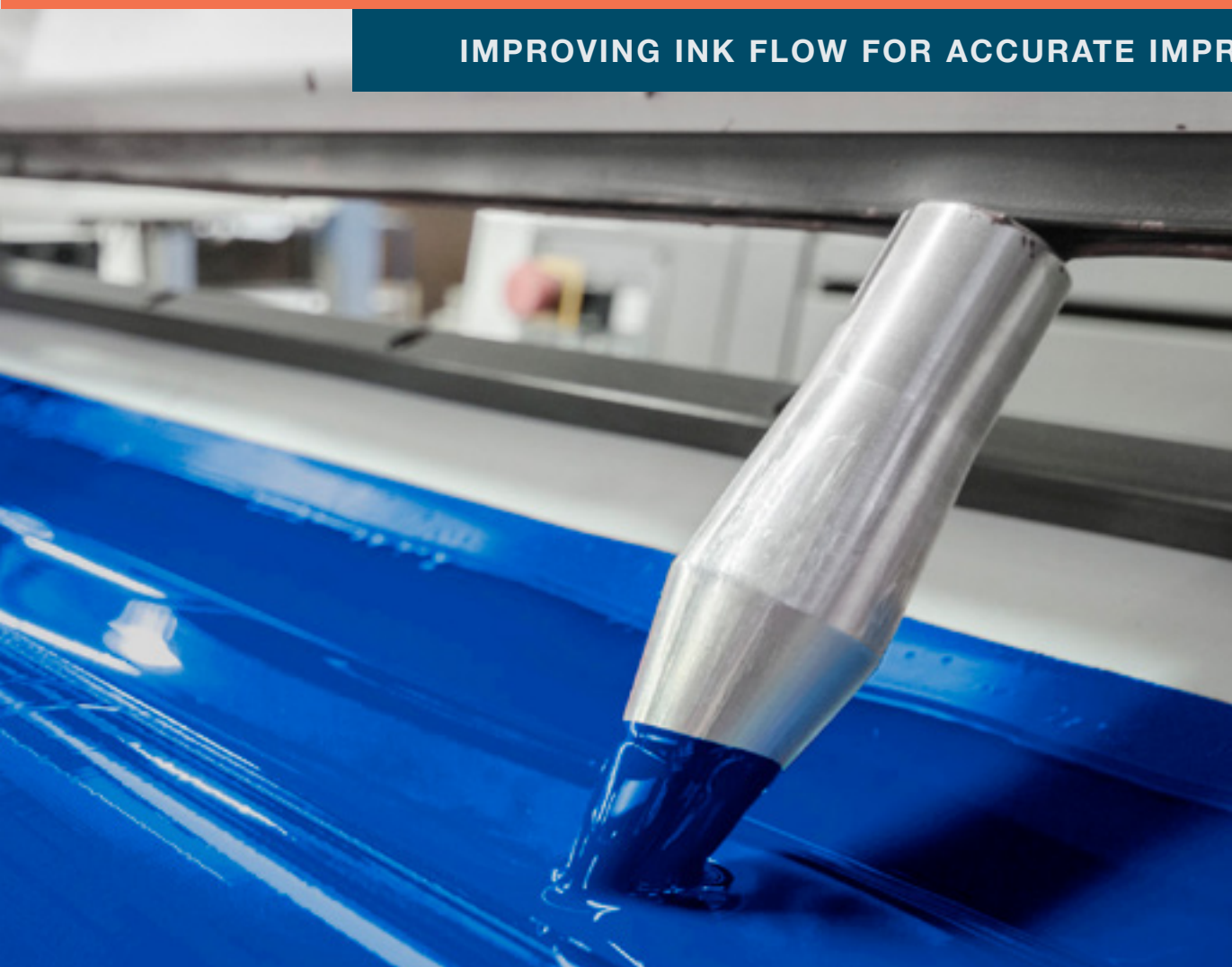


# Gravure

## Troubleshooting Guide

IMPROVING INK FLOW FOR ACCURATE IMPRESSIONS





**In the modern gravure printing industry,** you work hard to improve the quality of your printing. You're under increased pressure to maximize productivity, decrease waste and run efficiently to increase the bottom line. Your customers rely on your expertise in ink handling and maintenance in order to maintain the highest quality of the printed product. You experience a number of issues that keep you from reaching these goals.

This guide will help you identify the source of your difficulties and will provide solutions to help you solve your printing problems.

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## INTRODUCTION

As the demands of their customers change, gravure printers are under increased pressure to improve productivity, decrease waste, run efficiently and maintain a profitable bottom line.



Gravure printers historically have always been on the cutting edge of technology: Incorporating newer, faster presses, more reliable and durable components and consumables and state-of-the-art control systems, all in an effort to improve the quality of their printed products while maintaining costs necessary to bring the product to market. Despite taking these steps, gravure printers still experience a number of print-related issues that are keeping them from reaching their cost and quality goals.

This troubleshooting guide, compiled by a number of different suppliers and manufacturers to the gravure print industry, is designed to help you identify the cause and provide a solution to problems experienced by printers every day. It is not intended to be a “how to fix” guide, rather a template you can use to recognize and resolve print related issues before they get out of hand.

## Abrasion

**Problem:** Intermittent, non-uniform marks on printed image, premature roller wear

### CAUSE

1. Ink pigment not correctly ground
2. Ink incorrect for job or incompatible with solvent
3. Ink drying too slow
4. Mixing incompatible inks

### SOLUTION

1. Grind pigment to meet ink specifications
2. Check ink compatibility for job & solvent
3. Check solvent compatibility
4. Ensure unlike inks are not being mixed together

## Bleeding or Smearing

**Problem:** Color spreads into subsequently applied coating or adhesive

### CAUSE

1. Improper pigment use
2. Coating or adhesive may be rewetting ink
3. Ink viscosity too high
4. Incorrect solvent formulation

### SOLUTION

1. Reformulate ink, consult with ink supplier
2. Reformulate ink, consult with ink supplier
3. Reduce viscosity or film thickness
4. Use faster or slower drying solvents

## Cell Plugging (Also Drying in)

**Problem:** Weak, non-uniformed dots, ink and coating residue does not re-wet

### CAUSE

1. Cells plugged with paper, ink or coating

### SOLUTION

1. Check paper coating & control paper integrity
2. Increase ink fountain temperature
3. Ensure ink fountain temperature is above dew point

## Color / Hue Shift

**Problem:** Register movement causes shade changes to occur

### CAUSE

1. Improper cylinder cell configurations
2. Register sensors may be misaligned
3. Drier may be too hot for substrate
4. Improper register
5. Ink viscosity too high

### SOLUTION

1. Confirm correct cylinder is in use
2. Check and adjust sensors
3. Check and adjust dryer heat levels
4. Check cylinders
5. Adjust ink viscosity to acceptable print quality

## Color Too Strong

**Problem:** Actual printed color does not match standard

### CAUSE

1. Cell volume too great
2. Ink viscosity too high
3. Incorrect cylinder etch or engraving
4. Incorrect substrate or stock for job
5. Ink pigmentation too strong

### SOLUTION

1. Reduce cell volume
2. Adjust ink viscosity to acceptable print quality
3. Ensure proper cylinder has been pulled for job
4. Check stock or substrate
5. Add appropriate extender

## Color Too Weak

**Problem:** Actual printed color does not match standard

### CAUSE

1. Worn cylinder
2. Ink viscosity too low
3. Incorrect or dirty cylinder
4. Impression roller durometer too hard
5. Ink pigmentation too weak

### SOLUTION

1. Check and re-etch cylinder, add toner
2. Adjust ink viscosity to acceptable print quality
3. Check cylinder, clean if required
4. Check and replace roller if necessary
5. Add appropriate toners or decrease extender

## Color Variation

**Problem:** Inconsistent color reproduction

### CAUSE

1. Lack of viscosity measuring or control
2. Ink, solvent and or varnish flow inconsistent
3. Inconsistent set up and run procedures
4. Mixing incompatible or old inks
5. Inadequate mixing

### SOLUTION

1. Establish manual or automatic ink monitoring procedures for job
2. Check and calibrate flow rates as required
3. Establish pre-run checklist to reduce waste and quality issues
4. Ensure unlike or new & old inks are not being mixed together
5. Ensure ink in pail is properly mixed



## Cylinder Wear

**Problem:** Wear & abrasive damage to chrome surface

### CAUSE

1. Inadequate chrome plating
2. Foreign ink particles causing blade deformation
3. Irregular cylinder surface
4. Parting shell, separation
5. Ink drying too fast
6. Ink abrasiveness

### SOLUTION

1. Check cylinder thickness, hardness, plating & ductility
2. Check, filter and/or replace ink
3. Polish or re-cut and/or re-chrome roller
4. Replace cylinder
5. Ensure solvent is correct for ink blend, replace ink or solvent
6. Ensure pigments are ground correctly

## Dot Skip

**Problem:** Random spots on printed area or engraving dots that have not printed

### CAUSE

1. Ink drying too fast
2. Incorrect impression to substrate
3. Ink not applied to cylinder
4. Ink viscosity too high
5. Inadequate ink flow

### SOLUTION

1. Check solvent / ink compatibility
2. Check impression settings, adjust if necessary
3. Check ink flow, applicator
4. Adjust ink viscosity to acceptable print quality
5. Check ink level, ink tote and ink pump

## Excessive Ink Consumption

**Problem:** Less impressions per ink volume

### CAUSE

1. Viscosity too high
2. Ink color too strong
3. Weak/old ink
4. Excessive anilox volume
5. Metering roll too soft for job
6. Ink loss on startup or shutdown

### SOLUTION

1. Reduce viscosity
2. Use extender to weaken color to acceptable level
3. Check ink to original standard, check date and usage. Consult your ink supplier
4. Replace with appropriate anilox
5. Check metering roll durometer, reduce ink
6. Review ink handling setup & shutdown procedures

## Fisheyes

**Problem:** Print consists of only screen dots

### CAUSE

1. Ink drying too fast
2. Incompatible ink additive
3. Improper mixing

### SOLUTION

1. Check for correct solvent/ ink ratio
2. Check with ink supplier / tech
3. Ensure ink is mixed and agitated

## Float/ Film on Ink

**Problem:** Ink separated or contaminated

### CAUSE

1. Old or dirty ink
2. Incompatible ink additive
3. Improper mixing

### SOLUTION

1. Check ink chemistry, check with make ready / ink tech; replace ink with fresh supply
2. Check with ink supplier / tech
3. Ensure ink is mixed and agitated

## Foaming

**Problem:** Foam visible in ink pail or pump, missing print areas

### CAUSE

1. Ink exposed to too much air
2. Ink fountain level too low
3. Ink return too long for job
4. Ink viscosity too high
5. Ink not correct/ appropriate for job
6. Poor cleanup / ink contamination

### SOLUTION

1. Check pump speed & for leaks in ink lines
2. Ensure ink fountain is filling properly
3. Reduce return line distance
4. Ensure viscosity is reduced to allow entrenched air to escape
5. Check ink supplier or make ready ink tech
6. Ensure housekeeping / cleanup procedures are being followed

## Gloss Too High or Low

**Problem:** Incorrect ink reflective properties

### CAUSE

1. Gloss too high
2. Gloss too low
3. Viscosity too low (low gloss)
4. Inadequate mixing

### SOLUTION

1. Reduce viscosity to meet standard  
– Use pigmented extender
2. Adjust gloss extender
3. Adjust viscosity to meet standard
4. Ensure ink in pail is properly mixed

## Ink Drying Too Fast

**Problem:** Ink failing to transfer to substrate

### CAUSE

1. Ink/solvent ratio incorrect
2. Excessive moisture buildup on ink
3. Fountain not sufficiently covered
4. Mixing incompatible inks
5. Inadequate mixing
6. Housekeeping

### SOLUTION

1. Check solvent for ink compatibility
2. Check solvent for ink compatibility
3. Ensure fountain is adequately covered
4. Ensure unlike inks are not being mixed together
5. Ensure ink in pail is properly mixed
6. Ensure plate and roller cleaned prior to job

## Ink Drying Too Slow

**Problem:** Color bleed, ink pick off or blocking

### CAUSE

1. Ink/solvent ratio incorrect
2. Excessive moisture buildup on ink
3. Inadequate drying
4. Mixing incompatible inks
5. Inadequate mixing
6. Viscosity too high

### SOLUTION

1. Check solvent for ink compatibility
2. Check solvent for ink compatibility
3. Check drier for proper output
4. Ensure unlike inks are not being mixed together
5. Ensure ink in pail is properly mixed
6. Adjust viscosity to meet color standard

## Ink Settling

**Problem:** Pigment separation

### CAUSE

1. Ink/solvent ratio incorrect
2. Insufficient mixing
3. Inadequate pump velocity
4. Mixing incompatible inks
5. Old, used or outdated ink
6. Improper setup

### SOLUTION

1. Check solvent for ink compatibility
2. Check mixer agitation speed & direction
3. Ensure pump flow is correct for volume and circulation loop
4. Ensure unlike inks are not being mixed together
5. Ensure ink supply is fresh and/or not contaminated or old
6. Ensure setup procedures are being followed

## Misting or Cobwebs

**Problem:** Film-like or web-like buildup on doctor blade, impression roller press frame

### CAUSE

1. Ink/solvent ratio incorrect
2. Defective applicator
3. Air drafts at nip
4. Ink viscosity too high
5. Dried ink
6. Improper setup

### SOLUTION

1. Check solvent for ink compatibility
2. Check and repair the same
3. Check and restrict air movement
4. Adjust viscosity to meet color standard
5. Ensure oven isn't overheating the cylinder
6. Ensure set up procedures are being followed

## Mottling, Puddling

**Problem:** Poor ink transfer to substrate or uneven image on finished product

### CAUSE

1. Ink does not wet the substrate evenly
2. Ink viscosity too low
3. Cylinder pattern too large
4. Mixing incompatible inks
5. Impression cylinder pressure too high
6. Press speed too slow

### SOLUTION

1. Adjust blade angle or check ink / solvent ratio
2. Adjust viscosity to meet color standard
3. Replace with appropriate cylinder
4. Ensure unlike inks are not being mixed together
5. Adjust pressure to meet job specifications
6. Increase press speed to meet specifications

## Offset or Set Off

**Problem:** Lines of ink or no ink in print run direction

### CAUSE

1. Ink not sufficiently dried
2. Insufficient mixing
3. Inadequate heat and air to substrate
4. Rewind tension too high
5. Old, used or outdated ink

### SOLUTION

1. Check solvent / ink ratio or compatibility
2. Check mixer agitation speed & direction
3. Adjust oven temperature and / or air flow / volume
4. Reduce rewind tension / pressure
5. Ensure ink supply is fresh and / or not contaminated or old

## Picking

**Problem:** Inconsistent print quality with noticeable non-image areas

### CAUSE

1. Ink/ solvent ratio incorrect, slow drying
2. Low drying heat
3. Ink viscosity too high
4. Impression pressure too high
5. Press speed too fast

### SOLUTION

1. Check solvent for ink compatibility, use faster drying solvents
2. Adjust heaters and air velocity
3. Adjust viscosity to meet color standard
4. Ensure impression pressure set correctly
5. Reduce press speed

## Pinholes

**Problem:** Appearance of small holes in printed area

### CAUSE

1. Ink not soluble
2. Substrate imperfections
3. Ink or solvent incorrect for substrate
4. Substrate incorrect or not properly treated

### SOLUTION

1. Ensure solvent ink ratio is correct, reduce viscosity
2. Check & replace stock and /or adjust blade angle
3. Ensure ink is specified for film and solvent/ink compatibility
4. Ensure substrate and/or treatment are correct

## Screening

**Problem:** Printed color not same as standard

### CAUSE

1. Ink viscosity too high
2. Ink drying too fast
3. Blade angle too sharp

### SOLUTION

1. Reduce viscosity to meet color standard
2. Ensure correct ink / solvent compatibility
3. Adjust blade wipe angle



## Scumming

**Problem:** Faint ink appears on non-image areas of substrate

### CAUSE

1. Chrome cylinder too porous
2. Insufficient blade wipe
3. Ink not adequately mixed and soluble
4. Ink pigments are not ground properly

### SOLUTION

1. Re-polish or replace cylinder
2. Adjust blade angle or replace blade
3. Ensure agitation is adequate for the ink
4. Regrind pigments, replace inks

## Skipping

**Problem:** Print cell failure, speckles and spots on printed substrate

### CAUSE

1. Chrome cylinder too porous
2. Ink viscosity too high
3. Drying rate too fast
4. Ink not formulated correctly

### SOLUTION

1. Check screen, chrome and cell configuration
2. Adjust viscosity to meet print standard
3. Reduce fountain temperature, check ink / solvent compatibility
4. Reformulate or replace ink

## Static

**Problem:** Faint hairs or fuzz appears on areas of substrate

### CAUSE

1. Ink contamination
2. Insufficient moisture
3. Ink viscosity too low
4. Ink/ solvent incompatibility
5. Dust or debris around press

### SOLUTION

1. Ensure ink is filtered
2. Add misting stations
3. Add virgin or fresh ink to kit
4. Ensure inks and solvents are correctly paired
5. Ensure housekeeping practices are in place

## Streaking/ Lines/ Railroads

**Problem:** Horizontal or vertical lines, intermittent ink spots

### CAUSE

1. Cylinder surface problem
2. Debris, dried ink or nick in doctor blade
3. Inadequate chrome surface
4. Mixing incompatible inks

### SOLUTION

1. Check cylinder for imperfections, polish or replace as necessary
2. Check and clean or replace doctor blade
3. Check for flaking or chipping, replace as necessary
4. Ensure unlike inks are not being mixed together

## Trapping

**Problem:** Horizontal or vertical lines, intermittent ink spots

### CAUSE

1. Ink viscosity too high
2. Ink not properly drying
3. Film re-softened by solvent acetate
4. Ink wax formulation incorrect
5. Incorrect ratio of silicones or slip compound

### SOLUTION

1. Adjust viscosity to meet print standard
2. Adjust drier velocity, ensure correct solvent formulation
3. Adjust acetate / alcohol balance / ratio
4. Add pigment extender and/or add fresh ink
5. Reformulate ink to meet cylinder and substrate specs

## Our Company

**Norcross has been in business for over 75 years**, helping gravure printers solve their printing problems. Norcross provides a wide range of viscometers, controllers and accessories, along with technical expertise, technical advice and troubleshooting to help you increase your bottom line.

### Need Assistance with your Viscosity Issues?

Contact us for a free consultation, or find out what sorts of custom solutions we offer.

**CLICK FOR A CONSULTATION >**



**DOWNLOAD OUR VISCOSITY CONVERSION TABLE ↓**

Make accurate conversions between different units of viscosity.