

Viscosity, pH, and common printing problems directly impact ink transfer, color strength, and print quality. Use this complete guide to keep your printing under control and your performance at its best.

MEASURING, ADJUSTING & SOLVING FLEXOGRAPHIC PRINTING CHALLENGES

CONTROL. MEASURE. ADJUST. GET RESULTS.



1 VISCOSITY MEASUREMENT USING THE ZAHN CUP

- 1** Select the proper cup size
Use the cup size recommended for your ink system.
- 2** Check the temperature
Ensure ink is at the proper temperature before testing.
- 3** Fill the cup completely
Submerge the cup in ink and allow it to overflow.
- 4** Block the orifice
Place your finger firmly over the orifice.
- 5** Lift out of the ink
Remove the cup and immediately start timing.
- 6** Time the flow
Release your finger when the ink stream breaks. Stop the timer.
- 7** Record the time
This is your viscosity in seconds.

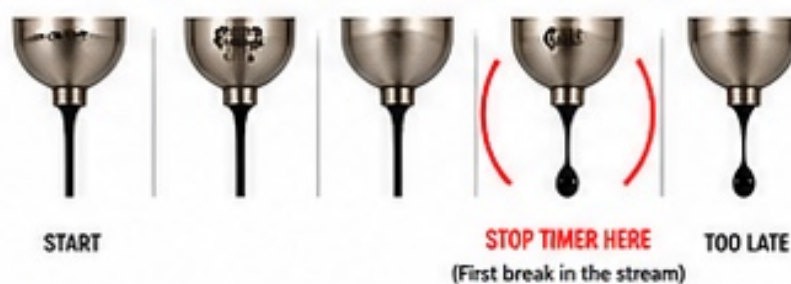


GOOD FLOW
A smooth, unbroken stream gives the most accurate reading.

IMPORTANT: CONSISTENCY IS KEY
Small changes in viscosity, pH or ink composition can cause big problems in print quality.

CHECK. ADJUST. VERIFY. EVERY TIME.

MEASURE FROM FIRST BREAK IN THE STREAM



GOOD PRINTING STARTS WITH CONTROL.

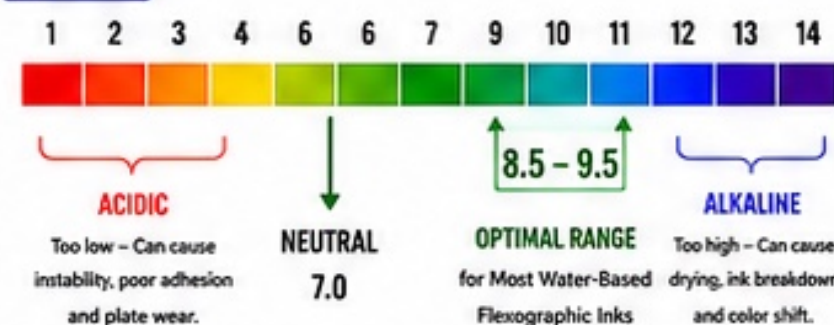


2 pH MEASUREMENT & ADJUSTMENT

Getting the pH right is critical for ink performance, stability, and print quality.

The ideal pH range for most water-based flexographic inks is **8.5 - 9.5**.

pH SCALE



pH & INK PERFORMANCE

pH TOO LOW (ACIDIC)

- ✗ Poor ink stability
- ✗ Plate pitting and wear
- ✗ Poor adhesion
- ✗ Slow drying
- ✗ Increased dot gain
- ✗ Color shift and fading



OPTIMAL pH RANGE (8.5 - 9.5)

- ✓ Best ink stability
- ✓ Strong adhesion
- ✓ Consistent drying
- ✓ Better color consistency
- ✓ Reduced plate wear
- ✓ Optimal print performance

pH ADJUSTMENT PROCEDURES

pH TOO LOW - RAISE pH

- 1 Use anilox cleaner / pH adjuster.
- 2 Add small amounts (1-2 mL per lb of ink).
- 3 Mix thoroughly.
- 4 Test pH.
- 5 Repeat until pH is 8.5-9.5.

IMPORTANT

Always add adjustment products slowly. Over-adjusting can cause ink instability and print defects.

TIPS FOR ACCURATE READINGS

- ✓ Calibrate your pH meter daily.
- ✓ Rinse the probe with clean water before each test.
- ✓ Test at room temperature.
- ✓ Tine ink.



3 FLEXOGRAPHIC PRINTING PROBLEMS: CAUSES & SOLUTIONS

PROBLEM	HOW IT APPEARS	POSSIBLE CAUSES	CORRECTIONS / SOLUTIONS
01. PINHOLES Tiny unprinted specks		- Contaminated anilox roll - Ink too viscous - Low surface tension on anilox - Low anilox volume - Drying too fast on press	✓ Clean anilox, plate and press ✓ Decrease ink viscosity ✓ Use higher volume anilox ✓ Add retarder or slow down conditions ✓ Ensure consistent ink flow
02. STREAKS Lines or scratches in the print		- Dirty or damaged anilox - Debris on plate - Worn anilox roll - Doctor blade poorly adjusted - Low or uneven ink supply	✓ Clean anilox and plate ✓ Replace worn or damaged anilox ✓ Adjust doctor blade ✓ Adjust doctor blade ✓ Check lubrication and flow
03. MOTTING / SPLATTERING Uneven dots, speckling		- Excessive vibration - Incorrect anilox for the job - Inconsistent ink viscosity - Inconsistent pressure - Worn plate	✓ Check vibration and correct ✓ Use correct anilox and volume ✓ Check and control ink viscosity ✓ Check print pressure ✓ Inspect the plate profile
04. LOW SOLID DENSITY Colors look light, washed out or see-through		- Too little ink - Low anilox volume - Worn plate - High press speed - Inadequate substrate absorbency	✓ Use higher volume anilox ✓ Increase ink / coverage ✓ Reduce press speed ✓ Check substrate or use primer / white
05. GHOSTING / PICKING Missing dots or solids		- Inadequate ink - Too much water - Incorrect print pressure - Too strong retarding - Ink not dried properly on substrate	✓ Reduce viscosity or ink level ✓ Reduce ink flow ✓ Adjust print pressure ✓ Allow more drying time ✓ Use the correct ink system
06. IMPRESSION Too light or dark impression		- Low anilox resolution - Worn anilox - Excessive pressure - Incorrect plate mounting - Substrate push or stretch	✓ Use higher resolution anilox ✓ Replace / regrind anilox ✓ Reduce pressure ✓ Reduce pad correct ink mounting ✓ Check and remount plate
07. BOILING Foam on the ink or print		- Incorrect plate mounting - Wrong type or batch - Web tension variation - Slip on the press - Improper ink sequence	✓ Check and remount plate ✓ Stabilize web tension ✓ Check press pressure ✓ Reduce ink temperature ✓ Improve drying
08. RAINING Ink dots in the ink		- Excessive ink return - Incorrect agitation or conditions - Blade damaged - Improper ink transfer	✓ Clean ink system ✓ Use cleaner / finer anilox ✓ Clean anilox / pan
09. POOR INK TRANSFER Ink not reaching the substrate		- Worn anilox roll - Worn anilox - Incorrect print pressure - High ink viscosity - Viscosity changes	✓ Clean anilox and plate ✓ Replace worn anilox ✓ Adjust print pressure ✓ Stabilize ink viscosity ✓ Control viscosity
10. COLOR VARIATION Inconsistent from print to print		- Temperature / humidity changes - Inconsistent ink - Component wear - Ink contamination - Inconsistent anilox	✓ Use ink from same lot ✓ Replace worn parts ✓ Keep ink system clean ✓ Check and control ink viscosity
11. BANDING Horizontal lines or variations		- Doctor blade anilox degrading (lines) - Press vibration or misalignment - Plate mounting issues - Worn anilox - Low or uneven ink supply	✓ Replace / regrind anilox ✓ Check vibration ✓ Check plate mounting & pressure ✓ Check plate mounting ✓ Reduce variation in ink flow



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