

Objective

Quality Printing

Gotham Ink Corporation
Water Based Ink
Handout

Quality Printing

Flexographic Printing

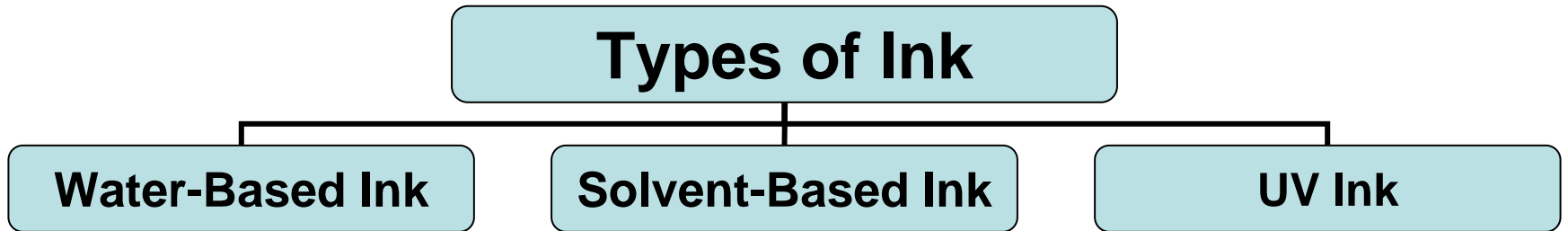
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graph TD; A[Flexographic Printing] --- B[Ink]; A --- C[Printing Press]; A --- D[Substrate];
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Ink

Printing Press

Substrate

Printing Ink



Water-based Ink

- Colorant – Pigments and Dyes
- Vehicle – Resin Solutions and Emulsions
- Solvent – Water
- Additives – Amines, Dispersing Agents, Surfactants, Defoamers, Anti-foams and waxes.

Water-based Inks

- Colorant – Color
- Vehicle – Transports and carries the pigment particles. Promotes the leveling, adhesion, mar, scuff, water, and chemical resistance.
- Water – Aids in suspending and dispersing ingredients. Lowers viscosity.
- Additives – Small amounts added to improve performance.

Water-based Inks

Additives Cont.

- Anti-foam – Prevents the ink from foaming.
- Defoamer - Breaks the foam that develops during the press run.
- Surfactant – Helps the ink to wet out the substrate.
(Paper, Film and Foil)
- Amine – Prevents the resin from thickening and gelling.
- Wax – Improves mar and scuff properties.

Press Set-up

- Be sure that the anilox roll, fountain roll, plate, impression cylinder, pan and hose lines are clean.
- Be sure that the contact pressure between roll and cylinders are set properly.
- Be sure that the ink is mixed thoroughly prior to use.

Ink-up The Press

- Measure the ink viscosity with a clean #2 Zahn cup.
- Reduce the ink viscosity with water/extender to approximately 5 seconds higher than desired running viscosity.
- As the press heats up, the ink viscosity will become lower.
- Usually inks are run in a range of 18 to 30 seconds.
- To minimize foaming be sure that the return ink hose is close to the surface of the ink.

Fine Tuning

- Adjust the anilox to plate and plate to impression cylinder for optimal print quality.
- Check color for shade and strength.
- If color is stronger than desired, reduce the ink viscosity a few seconds.
- Check color again.
- If the color is OK the press is ready to run.

Color Issues

Weak color could be caused by one of the following:

- Anilox roll filled-in or worn out.
- Reduced ink viscosity too much.
- Squeezing of the metering roll and anilox roll causing the ink to be pushed out of the cells.
- Presses equipped with doctor blades are not set properly.

Print Quality

- Drying time of the ink.
- Non-Curling of printed substrate.
- Uniform coverage.
- Proper color shade and strength.
- Sharpness of print.

Print Defects

- Ink Foaming
- Squeeze-out
- Offsetting
- Mottle
- Poor Trapping
- Flaking Of Ink
- Color Bleed
- Weak Color
- Color Too Strong
- Poor Ink Transfer
- Mar And Scuff

Solutions For Print Defects

Foaming

Appearance: Foam bubbles visible in ink pail and/or in fountain.

Causes: Entrapment of air in ink – particularly when pumping ink and running at high speed.

Cures: Add 0.5 to 1.0 % of 87-919 Defoamer very slowly to the ink while mixing or prepare a diluted solution of 87-919 in a spray bottle and spray on the surface of the ink. (Use a ratio of 1 part 87-919 to 9 parts of water).

Be sure that the return hose is kept near the surface of the ink to prevent free fall of the ink which can cause foam.

Squeeze-out

- Appearance: Heavy outline around printed characters.
- Causes:
 - 1) Carrying too much ink.
 - 2) Too much pressure between anilox roll and printing plate.
- Cures:
 - 1a) Thin the ink with extender/water.
 - b) Increase the pressure between anilox roll and metering roller.
 - c) Use finer anilox roll.
 - 2) Reduce the pressure between the anilox roll and printing plate.

Offsetting

- **Appearance:** Ink transfers to the reverse side of the substrate.
- **Cause:** Ink is not drying.
- **Cures:** 1) Check pH and adjust to 9.0 to 9.5 with 88-6058.
2) Replace 25% of the normal extender in the formula with the fast dry extender 46-613.

Mottle

- **Appearance:** Heavy or crawly print (Crow's Feet).
- **Causes:** 1) Too much ink on plate.
2) Ink viscosity too low.
- **Cures:** 1) Reduce ink volume on plate.
2a) Add fresh ink to raise viscosity.
2b) Add 2% of Print Aid 87-021 to the ink while mixing.

Poor Trapping

- **Appearance:** Second down color is not printing sharply over first down.
- **Causes:** 1) First down ink too wet.
2) Too much impression on second color.
- **Cures:** 1a) Reduce ink volume on plate.
1b) Use fast dry extender and check pH.
2) Use less impression on second down color.

Flaking of Ink

- **Appearance:** Ink flaking off or cracking.
- **Cause:** Ink too brittle and drying too fast.
- **Cure:** 1) Add 2 to 3% of curl out 87-026 to the ink while mixing.
2) Add 10 to 20% of extender.

Color Bleed

- **Appearance:** Stain on reverse side of substrate; halo around print.
- **Causes:** Substrate lacks hold-out and absorbs dye or soluble pigment from the ink.
- **Cures:** Run ink at a higher viscosity.

Weak Color

- **Appearance:** Color paler than desired.
- **Causes:**
 - 1) Ink too thin.
 - 2) Insufficient ink being carried.
 - 3) Anilox filled in with dried ink.
- **Cures:**
 - 1) Increase viscosity of the ink with fresh un-thinned ink.
 - 2) Increase machine speed.
 - 3) Clean anilox roll.

Color Too Strong

- **Appearance:** Color more intense than need.
- **Causes:** 1) Too much ink being carried.
2) Color of ink too concentrated as formulated.
- **Cures:** 1) Reduce ink volume by adjusting metering roll/doctor blade or add thinner (extender/water) if necessary.
2) Add extender until desired color strength is achieved.

Poor Ink Transfer

- **Appearance:** Inconsistent ink coverage.
- **Causes:**
 - 1) Ink drying too fast.
 - 2) Press needs fine tuning.
 - 3) Ink not releasing properly from cells.
- **Cures:**
 - 1) Use 87-026 Curl Out (2 to 3% by weight while mixing).
 - 2) Adjust metering roll to anilox/ anilox to plate/ plate to impression cylinder/ remove any air bubbles or inspect for plate wear.
 - 3) Use 87-021 Print Aid (1 to 2% by weight while mixing).

Mar and Scuff

- **Appearance:** Tracking, streaks or smudges.
- **Causes:**
 - 1) Ink too high in viscosity.
 - 2) Ink drying too slowly.
 - 3) Tracking rollers on printed image areas.
- **Cures:**
 - 1) Reduce ink viscosity with water/extender.
 - 2) Use Fast Dry Extender or use ink containing wax.
 - 3) If possible move tracking rollers away from printed image.

Additives And Their Uses

46-613 Fast Dry Extender

- Add or replace 10 to 20% of the existing extender in the formula to reduce tackiness of the ink.
- To reduce tackiness of the ink on inside tints add approximately 8 oz per gallon of ink.
- Excessive use of the fast dry extender will cause paper to curl.

88-6058 pH Stabilizer

- Add as needed while stirring to maintain pH between 8.5 to 9.5 for optimum viscosity stability.
- To prevent shocking of the ink, add about 10 to 20 oz of 88-6058 to a gallon of water and use this mixture to maintain pH of the ink.
- Use of too much pH stabilizer will cause the ink to thicken and will slow drying time.

87-919 Defoamer

- Spray defoamer on the surface of the ink from a well-mixed spray bottle of defoamer.
- Use of too much defoamer will cause printing problems such as non-uniform coverage, fish eyes, streaks and ink gelling.

87-021 Print Aid

- Print Aid is useful for improving ink carry- up and uniformity of coverage.
- Use only 1 to 2% by weight.
- Addition of too much will result in high ink viscosity and/or tracking.

87-026 Curl Out

- This additive is designed to de-curl blanks when printing tints or full coverage, improve ink coverage and aid in slowing drying time of ink on plates.
- Use 2 to 3% by weight.
- Use of too much will result in slow drying and tracking.

Quality Printing

Quality printing is achievable by understanding this information and using it properly. You should check with your ink supervisor if you have any questions or problems.