

How to Solve Problems on Press

From inks and printing presses, to rollers and plates, the printing process can be complex. Here are the most common challenges and how to troubleshoot them.



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In today's fast-paced world, the last thing printers want to think about are issues on press. This means it's essential that printers produce color to required specifications as efficiently as possible. But problems can arise, especially given the various technologies, methods, and materials used for package printing. That's where troubleshooting comes in.

To understand the complexities of printing processes, consider that there are more than 3 million variables involved in reproducing an ink on substrate. Those variables include press speed, ink solubility, the plates and sleeves that are used, tackiness of the ink, extended color gamut versus CMYK, anilox cell count and configuration,

anilox volume, as well as the conditions that are specific to each press.

The real value of troubleshooting, though, isn't in eliminating variables in reproducing ink performance. In fact, ink is just one component, and really is an indicator that something's not right. Figuring out what that "something" is that's

causing diminished print quality is the most important outcome of a troubleshooting process.

To solve technical problems that may arise across any type of package printing, printers can assess and solve challenges across multiple print processes via a five-step technical service approach¹:

- 1. Identify performance requirements.** The first step is to define goals and objectives for the troubleshooting project, especially determining print performance requirements that must be met to achieve a successful outcome. Understanding the clearly defined end result and specs at the beginning of the troubleshooting process is essential.
- 2. Conduct a site audit.** This step will provide a comprehensive review of press conditions and other variables impacting print quality.

- 3. Select the appropriate product.** After the site audit, an ink is selected based on the conditions and needs of the pressroom and what the printer needs to achieve.
- 4. Run press trials.** The ink is tested to ensure it delivers the desired results. A report is generated. Ninety-four percent of the time, the right product was chosen and delivered because of the upfront audit work.
- 5. Finalize product qualification.** If the ink delivers the quality the printer wants to achieve, then the product is qualified. The customer is the only judge of delivered quality and qualified product.

The Most Common Performance and Quality Challenges

Inks, printing presses, rollers, plates, and other pressroom equipment critical to printing success all come with specifications. Following those specifications will maximize pressroom efficiency and a positive outcome. A checklist can ensure steps are performed in the right order from the outset.

In response, Sun Chemical put together an Ink Troubleshooting Guide to help printers troubleshoot pressroom problems and offer potential solutions for all printing processes. Specifications are particularly critical to ink development to help ensure inks are formulated to meet standards and minimize problems on the press.

Based on topics people have searched for over the last year using the online Ink Troubleshooting Guide, here are a list of the top challenges by printing process, along with a few potential troubleshooting solutions to resolve the issue.

Of note, understand that the troubleshooting guide provides general solutions to possible challenges on press and shouldn't replace the value of talking directly to sales or a technical representative.

Key Problems and Solutions for Flexographic Printing

Ink Smearing



Ink smearing is a common problem in flexo printing that can manifest in different ways. Potential solutions depend on what problem is appearing. In order of importance of problems — the first layer of ink is not fully dry when subsequent layers are applied.

Resolving this issue could require addressing ink tackiness to ensure it's sufficient to adhere to multiple layers to paper, film, or other substrates. Begin by examining how fast the press is moving to determine if decreasing the speed leads to more thorough ink drying. Other solutions include: reducing ink viscosity, decreasing ink thickness by changing metering conditions, adding faster drying solvent, or adjusting air balance and heat.

Pinholes



Visible in the form of small holes in the printed area, pinholes usually appear because of the failure of a printed ink to form a complete

continuous film. Sometimes, pinholing occurs when ink dries too fast and doesn't make an impression on the substrate. In that case, try adding slower-drying solvents.

Pinholes can also result from a substrate that's poor or marginally treated. This can be solved by checking and adjusting treatment levels or changing stocks. Another problem could be that the impression between plate and substrate is too low, which can be addressed by increased plate impression and checking print appearance.

Another common problem that occurs in flexo applications is when dots bridge together that shouldn't. When that happens a section of the printed package takes on a dirty appearance. Typical causes can be the anilox volume is too deep for the dot size and an excessive amount of ink is metering to the plate.

This can be resolved by reducing anilox volume or increasing plate dot size. Dot bridging can also occur when ink is flooding plate dots due to loose ink metering or worn doctor blades. If this turns out to be the root cause of the problem, then check and adjust ink metering, or inspect and replace the doctor blade. Whether it is ink smearing, pinholes or dirty print, additional problems on a flexographic press could be present that would require further analysis to determine what is behind the problem. To successfully troubleshoot on press requires following a systematic approach to make sure the actual problem is being addressed.

Key Problems and Solutions for Sheetfed Offset Printing

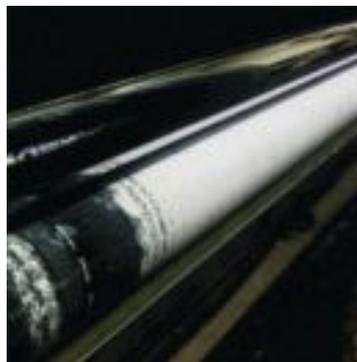
Tinting/Toning/Scumming



The condition of the fountain wash is usually the most common cause of tinting/toning/scumming. To resolve this press challenge, examine the condition of the fountain solution. If dirty and old, replenish with fresh solution at recommended dosages and correct temperature. Alternatively, if the fountain solution is out of balance, address it by draining pans and tanks, then refilling with fresh fountain solution at correct pH, conductivity, and Brix levels.

Roller settings or a roller durometer that are out of specification can also cause tinting/toning/scumming, and can be fixed by checking roller durometers and settings according to press manufacturer recommendations.

Metering Roller Build-up

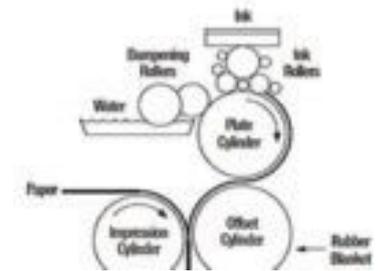


Ink can build up in a metering roller because the fountain solution circulation system is contaminated. In that case, the solution is to drain, clean, flush, and replace filters, then refill with fresh fountain solution and desensitize the rollers. Another reason metering roller build-up can occur is when an improper fountain solution mix is used. The solution would be to check the pH, conductivity, Brix level, and temperature, making sure the pan temperature is no higher than 65°F (18°C).

Slow Drying and Slow Setting

Ink that takes too long to dry or set can negatively impact quality. The pH of the paper and paper absorption are sometimes factors that can lead to slow drying and wetting. The pH values of paper should range between 6.0 and 8.0, as readings lower or higher will affect ink drying; a paper with low absorption will prevent the inks

from setting and will slow down the overall drying of the ink film. As with the other challenges associated with sheetfed offset, the fountain solution plays a part in drying and setting. High acidity levels in the solution will impede the oxidation, as will high levels of alcohol substitutes.



Whether it is tinting/toning/scumming, metering roller build-up or slow drying, additional problems on a sheetfed offset press could be present that would require further analysis to make sure the actual problem is being addressed.

Key Problems and Solutions for Energy Curable Printing

Ink Piling



A common issue with energy curable printing (especially in web offset applications) is ink piling, which occurs when ink "piles up" on a plate or other areas of the press. This can take place when ink becomes over emulsified, causing the pigment to separate due to insufficient tack and viscosity.

When this happens, solutions could include running less fountain solution and lowering the isopropyl alcohol concentration. Another cause is the ink roller train becoming too cool, which can be remedied by adjusting the oscillator surface temperature to 80°-85°F.

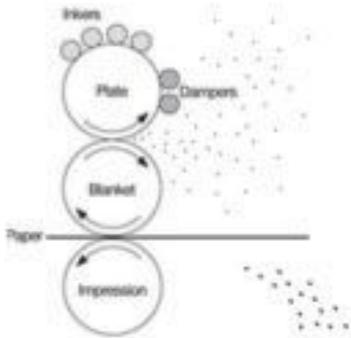
Scumming



A common energy curable defect is the result of ink that is misplaced on a printing plate. Scumming causes can include ink rollers that are too hard or too soft, which can be addressed by checking the durometer, setting, and condition of ink rollers, and making adjustments as necessary.

Or, the fountain solution could be out of balance. In that case, draining pans and tanks and refilling them with fountain solution of correct pH and conductivity should clear up the scumming.

Misting



This pressroom challenge occurs when the ink creates a mist as it's "slung" from rollers. Tied to ink viscosity, too much ink is being carried in an effort to achieve the desired density. The solution is to substitute a stronger ink and run a thinner ink film on rollers.

Misting can also take place when rollers are worn or improperly set, or the roller train is too hot. Check the roller for damage, the roller settings, and look for extreme temperature build-up on rollers. For a roller train that is too hot, reduce the oscillator

surface temperature to 85°F, ± 5°; higher temperatures cause ink to become too thin.

Key Challenges and Solutions for Gravure Printing

Abrasion



When your cylinders are worn down too quickly, it can cause problems on press. For example, abrasion on the cylinder can occur if a pigment isn't ground, and this is a problem that cannot be ignored. Grinding the pigment should clear this up, but make sure the correct pigment is being used. If not, then a selection of different pigments would be required. Another possible reason for abrasion could be solvent drying too fast, causing a dry wipe. A common fix in that situation is to balance solvent blends, but, again, a proper review should be taken to see how best to resolve problems on press.

Snowflaking



This blemish is often related to the substrate that's used. For example, a stock that is too rough can be addressed by using an electrostatic assist with polar solvents. Ink viscosity that's too high is another

problem that is remedied by reducing it. Snowflaking can occur when ink dries too fast. Adding slower drying solvents to the ink or adjusting print speed to the ink drying rate should fix that problem.

Mottle



Lastly, an additional common gravure printing problem is the uneven appearance of packaging printed. Known as mottling, this printing defect can be the result of ink viscosity that is too high or too low, and needs to be adjusted accordingly. Mottle also happens when paper stock is too dry, and can be addressed by introducing moist air into the process. Another cause is ink not wetting the stock properly, which is solved by changing the blade angle and then the solvent selection. More problems and solutions associated with mottling can be examined online.

Conclusion

As pressroom technology continues to advance and as variables are adjusted, changes to the ink almost always are needed. If the press shifts to faster print speeds, then a new ink — or modifications to the ink — may have to be considered to avoid challenges on the press. Worn out equipment, such as rollers or plates, can also play a role in printing defects. ■

'This five-step technical service approach was developed by Sun Chemical.

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