Scumming—The #1 Most Common Lithography Defect

IMDPA
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Symptoms, problems, and recommended solutions for troubleshooting scumming

By Jack Knight

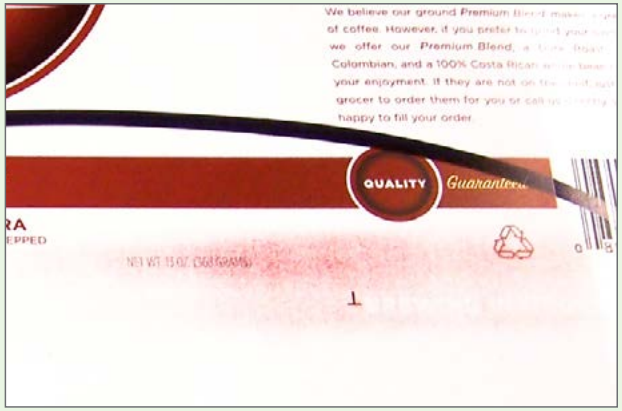
In my travels around the world the #1 litho defect I've seen shared by printers is scumming. In this article I will identify symptoms, problems and recommended solutions for troubleshooting this litho defect.

What is scumming?

In offset lithography, scumming is a generic term for the presence of ink on non-image areas of the printing plate, which can be caused by a variety of press conditions. The symptoms occur when ink randomly appears on non-image plate areas and scum cannot be washed off easily.

Before I recommend solutions, there are a few questions you need to ask yourself first.

1. **Is the scum isolated to one press, multiple presses, or on all presses?**
2. **Does the scum appear at start up? Or does it appear during running?**
3. **Does the scum appear only on certain colors? Which colors?**
4. **Does the scum come and go or is it always in the same spot?**
5. **Do water sources matter and why?**
6. **Press start up… What do you look for?**



#1 Is the scum isolated to one press, multiple presses, or on all presses?

Scum can happen on any unit at any time when the ink and water balance is not in controled.

The ideal water temperature in the dampening system chiller tank is between 50 to 60º F. Warmer temperatures will cause scum; colder will result in poor ink lay down. If the dampening form roll pressure is not set to the plate at the correct setting, you will have scum problems. Check the setting between the water pan and metering rolls to insure they are set at the right squeeze.

Has the dampening system metering roll been skewed throwing off the settings?

If the dampening system water pan roll is oxidized, then it will not carry the water evenly. Clean the roll with an approved water pan roll cleaner.

#2 Does the scum appear at start up? Or does it appear during running?

The start up is key to making sure you have good ink and water balance, but it can be an issue during the run if that balance is disrupted. You will have scum problems if the ink form roll settings to the printing plate are not set correctly. Too much or too little pressure to the plate will cause scum. Using too much ink reducer in an ink to adjust the body will cause scum problems. Do not use any!

#3 Does the scum appear only on certain colors? Which colors?

Ink companies perform a test on inks called water pick up. Each pigment will absorb water at different levels and absorption rates. There are known water pick up problems with certain colors all due to the pigment. Some printers like to add transparent white ink to colors on press. It is clear and is used to weaken the ink or extend it. Transparent white ink also likes water; do not use it with full strength colors. If you use it, you will have to increase the ink film thickness (density) to get your color. As you increase the density the water must be increased. As you increase both ink and water you will start fighting scum problems.

Be careful during ink roll wash ups to insure you do not get any wash up solvent into the dampening system. Solvent in the dampening system will cause scum. Check the conductivity in the water supply pan. If it is different than what is in the chiller then you probably have solvent in the pan. It takes a while for the pan to completely recirculate into the chiller.

#4 Does the scum come and go or is it always in the same spot?

Check the ink rolls after a color wash up for wet spots. Wet spots mean solvent is trapped on the ink rolls and did not dry off. Ink roll settings are off if you see this condition. It's also good to rinse the ink rolls with warm water after a color wash up to get any trapped solvent washed off.

#5 Do water sources matter and why? Starting with a conductivity as close to zero as possible is the best practice before adding your etch and alcohol or alcohol substitutes.

Check the conductivity of the fountain solution after mixing it. The range should be at 1200 – 1800 micromhos to start with a maximum running condition of 2500-5000. Remember to use DI (De-ionized) water whenever possible to give you as close to zero micromhos starting point as possible. One gallon of plain reverse osmosis treated water should be approximately 40 micromhos. More fountain solution "is not better".

If the fountain solution supplier recommends you use 1.5 to 4.0 ounces per 1 gallon of water, then that's what must be used. I can't begin to tell you how important conductivity is in running a press. I recommend you change the fountain solution in the chiller tanks when the conductivity hits 2500-5000 maximum depending on your set parameters. Conductivity is more important than pH. All fountain solutions are buffered which means if you add more than the suppliers recommended amount the pH will not change; more is not better it is worse. As you add more fountain solution, the conductivity increases and, as the conductivity increases so does your solutions ability to keep the printing plate clean. Remember to check the conductivity meter's calibration before you use it.

Alcohol must be Isopropanol at 99%. Use no more than 10% at any time. The less the better. Alcohol is a solvent so it will reduce the strength of an ink. If too much is used your instinct will be to add more ink and then more water—leading to scum. Alcohol also drops conductivity—so measure fresh solution before you add any to get your real starting numbers. (Alcohol is still used in some parts of the world where they have not been restricted as they have been in the U.S.).

Do the press operators wash the printing plate with solvent? If yes, then it must be washed off with water. You do not want solvent in the press or on the printing plate. Do the press operators speed up the

dampening system to clean scum off of the plate? If yes this adds a lot of water in the ink train and we are back to ink and water balance again.

#6 Press Startup…What do you look for? Wow!

That's a lot to remember so let's get printing! Start the press to get the lay and color, when you are ready to print, ramp the speed up to operating line speed. After you print some sheets, look for a scum line along the front or gripper edge of the printing plate. No line means too much water, a wide line means not enough water, an even thin line means the ink and water balance is just right. It is more difficult to balance the ink and water on a wider press, so everything must be just right. There is a narrow window for ink and water control and remember to audit the plate-making department to insure they are gumming the plate properly.

Scumming Recap

Symptoms

Ink randomly appears on non-image plate areas, and scum cannot be washed off easily.

POSSIBLE CAUSES

- Conductivity
- Fountain solution is too hot in pans
- Ink or dampener rollers are set too close or too tight
- Blanket is over-packed or too tight
- Contaminated wash-up solutions from prolonged use
- Plate is not properly sensitized
- Fountain solution is out of balance
- Wrong ink roller durometer (either too soft or too hard)
- Roller train temperature is too hot

RECOMMENDED SOLUTION

- Check pH; make sure it's in the correct range for your process
- Maintain fountain solution at 60°-65°F/15°-18C in press pans
- Check and reset rollers
- Check packing and re-torque rollers
- Change to fresh wash-up solution
- Consult with pre-press department
- Drain pans and tanks. Refill with fresh fountain solution mixed to standard
- Check the recommended durometer setting, the condition of ink rollers
- Maintain 80°-85°F/26°29°C surface temperature on oscillators