MURAKAMI SCREEN USA

Technical Newsletter - March 2012

MURAKAMI SCREEN U.S.A., INC. *745 Monterey Pass Rd. Monterey Park, CA 91754 Tel 323.980.0662*

My Screens Won't Reclaim Easily, Why?

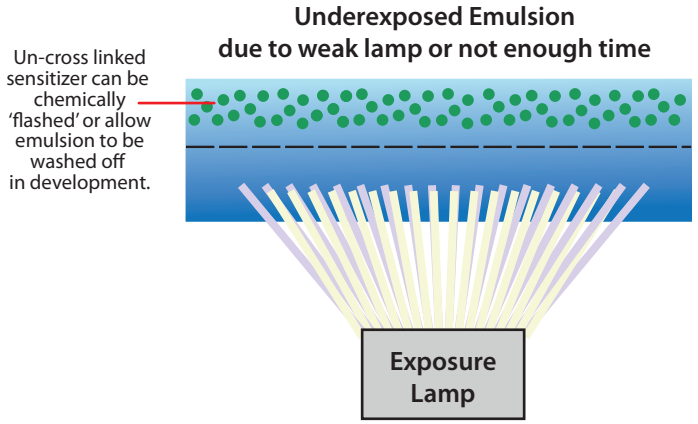
First what do you clean your screens with?

What does your screen cleaner have to do with screen reclaiming you may wonder? Well emulsions when underexposed are still sensitive to both light and solvent based chemistry which can lock in the emulsion and make reclaiming difficult. In recent years there has been a trend away from mineral spirits, recirculating parts cleaners and paint thinner as a wash up chemical for plastisol inks. Driven by local air quality control agencies trying to limit Volatile Organic Compounds many solvent chemistries have been banned in favor of low VOC screen cleaning chemistry. Yet there are still many areas of the world and shops that use solvent chemistries as well as 'hotter' chemistries like MEK, Xylene, Acetone and Screen Openers for faster cleanup of plastisol ink. These chemistries can have an adverse affect on the emulsion and the reclaiming process which we will discuss in a moment.

The advantage of the newer cleaning products is they have less harmful affects on the worker and the environment. In addition to worker safety the new chemistries do not affect emulsion like the solvent chemistries mentioned above. To understand how emulsion can be affected by screen cleaning chemistry and become difficult to reclaim we need to look at the many different types of emulsions.

There is a reason for the variety of emulsions in our catalog due to the wide variety of inks that can be printed. The different emulsions can be viewed as a spectrum. You can have emulsions designed to withstand water base and discharge on one end, and emulsions that can withstand hot solvent inks on the other end of the spectrum. There can also be emulsions that fall in between and can withstand both solvents and water but rarely have the durability to withstand them as well as one specifically formulated to withstand either water or solvents.

Underexposed screens can still be sensitive and have un-cross linked sensitizer. While these chemistries can quickly clean or open up the image the emulsion can get 'locked' in and be difficult to reclaim down line in the production process. To fix this issue we need to go back to how the screen was exposed, and did it receive any post exposure to complete the cross linking of all sensitizer?



I read a lot of the print forums to help our customers solve some of these issues and have found that a lot of us have developed bad habits on screen exposure. There is a major difference between ***'imaging'*** and ***'exposing'*** a screen. One of the worst habits is underexposing emulsion to get details. I have seen large shops go out of business over this issue. While their underexposed image showed great tonal range, over half the emulsion was being washed down the sink during screen development. Sure it had incredible 5-10% tonal values along with a lot of pinholes that required painstaking block out technique and a screen that will be lucky to make it past 100 pieces without breaking down more. Water base or discharge inks? Forget about it! Your emulsions for water based inks will breakdown quickly if you like to underexpose to capture tonal values. Proper, complete exposure is the key to both durable screens and pure photopolymer emulsion reclaiming. Making wild claims that you can expose your screens in 40 seconds on a bargain basement exposure unit may get you an image, but not a screen that will be durable and one that may get chemically flashed causing the emulsion to lock in. Obtaining an image is easy, getting a fully exposed screen with an image is what makes Murakami emulsion different. Our emulsions are designed to be completely exposed and image well, with details and tonal values printable on a durable production screen.

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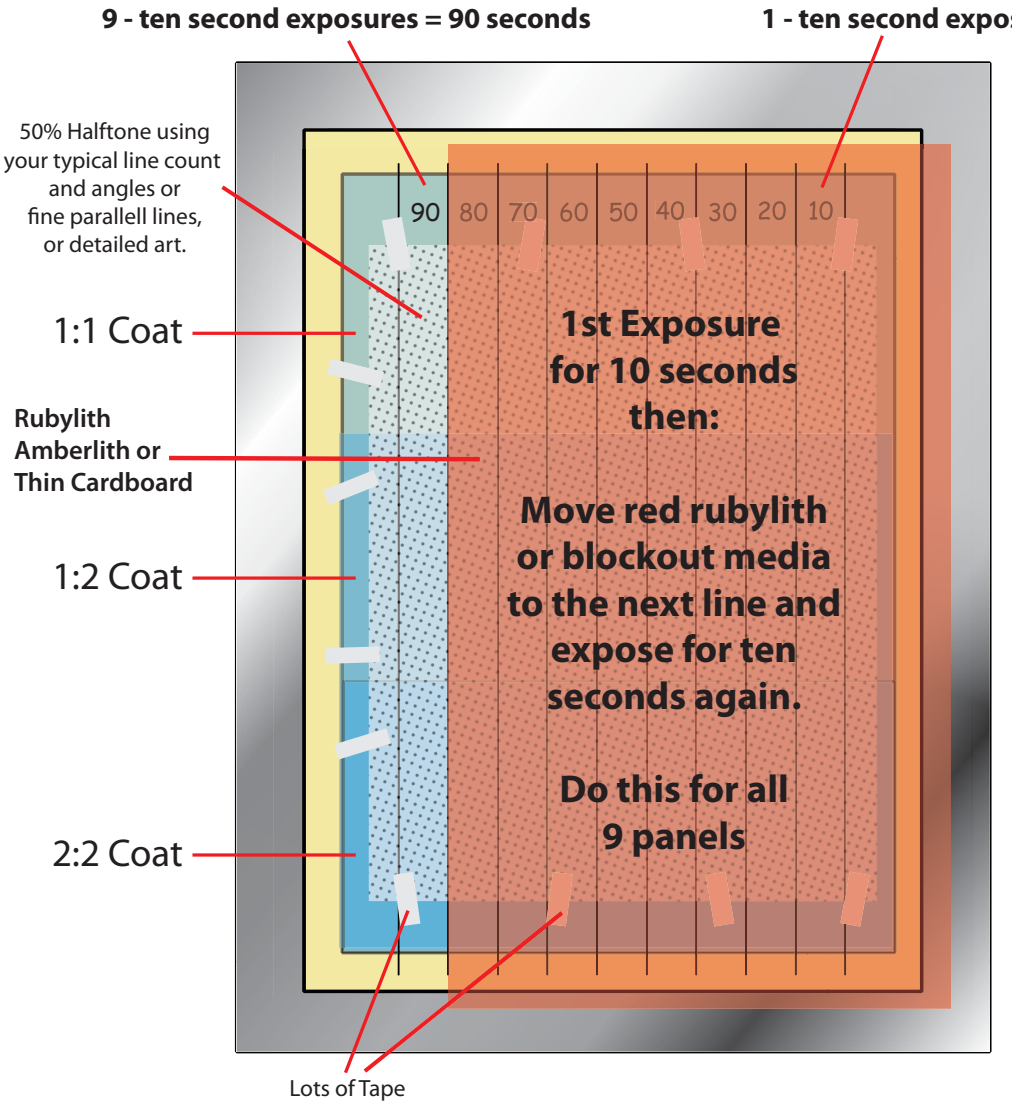
Here are some common issues and the recommended solutions:

Q: How can I get details and halftones to wash out without underexposing?
A: There are several answers to this issue:

- What was the coating technique? It could be the emulsion is too thick for the art. We recommend 1:1 coating on mesh below 200 using the dull edge and 1:2 coating on mesh above 200 tpi using the sharp edge, but a lot depends on your brand of coater, coating speed, temperature of the emulsion and angle of the coater. If your higher end mesh is still having difficulty resolving fine halftones lower the coating to 1:1 sharp or perform the coating/step test below.

A thinner emulsion coat can help resolve fine details. Too thin a coat however affects edge definition and durability. The thickness of a scoop coater edge varies between manufacturers, so the number of coats and which side to use requires some experimenting. Most printer's don't have a thickness gauge to measure the EOM (emulsion over mesh). Try this technique: Coat once on the print side and once on the squeegee side. Then coat the inside two thirds of the screen length, then coat once more on the print side and stop one third of the screen length. Run a step test at a right angle to this coating technique. Develop the screen and inspect the image with a loupe on the fine details to determine which coating technique produced a better image and note the panel time as well.



Note:
This example is for a 5kw lamp exposing a 180Y mesh using Aquasol HV.

Your test will need more time for lower watttage lamps or dual cure or diazo emulsions.

1.25kw - use 40 seconds instead of 10 seconds.

500w - use 100 seconds instead of ten seconds.

Fluorescents - Use 80 seconds instead of 10 seconds.

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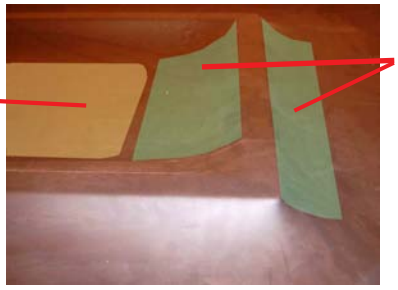
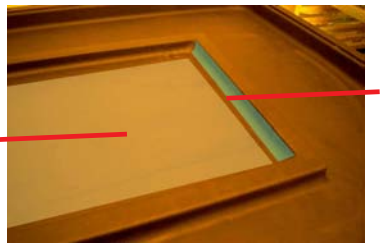
Here are some common issues and the recommended solutions:

- Maybe it's not the emulsion coating technique. What condition is the vacuum frame in? Does the blanket draw down tight around the screen?





If you don't see the vacuum blanket drawn down tightly around the frame, chances are you are losing details on the outside area of the art where the blanket is barely in contact. To resolve those details workers will underexpose the screen, presses will stop and start to fix pinholes or screen breakdown on press, and when the screen comes back it may be difficult to reclaim due to exposure to screen openers or solvents. The excess labor needed is far more than the cost of replacing the vacuum blanket.

When exposing screens use a large piece of black cloth placed between the screen and the vacuum blanket to prevent transferring plastisol and to protect the vacuum blanket rubber from sharp corners on the frames. You can always replace the black fabric cheaply, far less than the cost of the vacuum blanket. This practice also prevents glitters from getting on the vacuum blanket and glass which are a major source of pinholes in textile print shops.

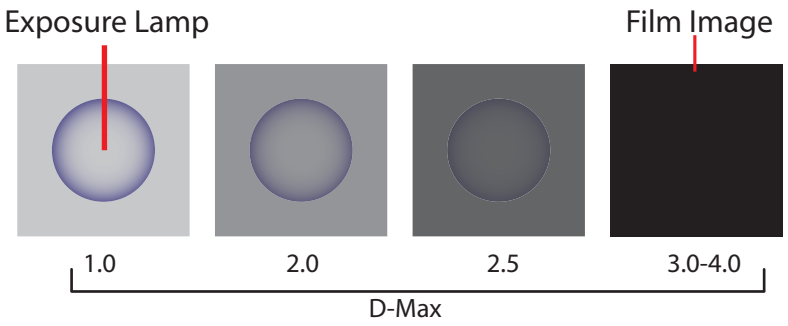
Washout Technique:

- If you don't trust your exposure strength and need to use a weak stream of water to wash out the image to keep halftones from falling off, then this is a tell tale sign of severe under exposure or a weak emulsion. When Murakami emulsion is exposed well it is very durable. A 600-1200 psi pressure washer on fan spray should be used for development at a distance of 12-18 inches. SBQ emulsions do not develop like a diazo emulsion. Diazo emulsions melt out of the screen while SBQ emulsions need more water pressure to develop. When Murakami emulsion is exposed properly with a strong light source you can use far more water pressure than competing emulsions to develop those fine details and create a screen that is durable on press.

Film: D-max is the key to strong exposures:

- Your film may not have enough opacity in the image areas - If you can see through the black areas of your film the light from your exposure lamp will also go through the black image areas and can cause the emulsion to partially expose. D-max refers to the opacity of the black image on film. To expose emulsion completely you need opaque art that blocks the exposing light well. Vellum, transparencies and films that have low D-max cannot achieve complete exposure. Murakami sells Jet 5 Film and Wasatch SP Rip to control issues with film D-max.

Solution for low D-max Film: You can develop gently and post expose in the sun or with the exposure unit to increase the strength of the remaining emulsion, but the most important part of the emulsion that rests over the mesh knuckles may be washed away during development and squeegee abrasion will still cause early stencil breakdown.



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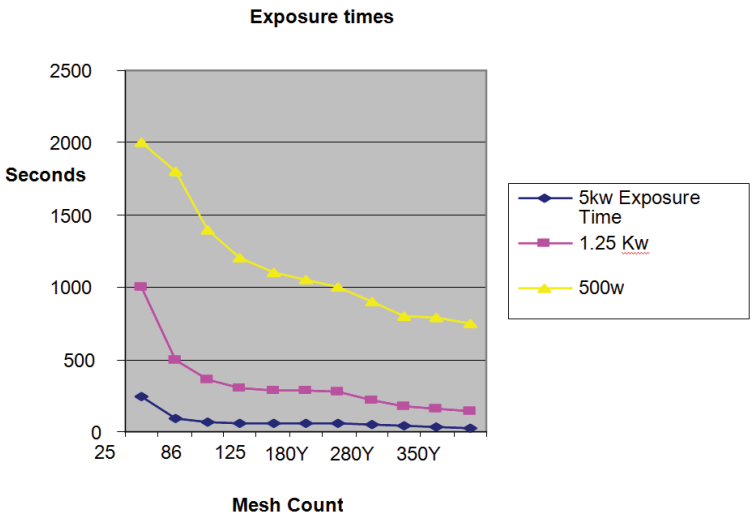
Plant Communication:

• Screen makers need to listen to production and reclaiming. This is a common mistake where screen makers push screens to production that were only ***'imaged'*** and not ***'exposed completely'***. This is a major pitfall of companies who trust the screens from the screen department while ignoring reclaiming issues and breakdown on press. Procedures in screen making can increase or more importantly ***decrease*** down line labor costs depending on the exposure quality of the screen.

Exposure Times:

The chart below shows the exposure times for three common exposure lamps. Exposure times vary from shop to shop slightly and can be affected by the ambient conditions of your shop. Cold, wet, rainy areas will have slightly longer exposures than exposures in a warm, dry desert area of the country using the same equipment due to the fact that humidity blocks the exposure process within the emulsion. You can determine times with an exposure calculator, but your film needs to have similar d-max or black opacity for this to be accurate. See page 2 for running a step test using your films and images. Or go to this link:

http://www.murakamiscreen.com/documents/StepTestI



Summary:

Underexposing the screen ***'compromises'*** the emulsion performance and can have ***'consequences'*** in production and in screen reclaiming. Screens will break down sooner with any ink system and screen wash up with solvent chemistry will lock in the emulsion making screen reclaiming difficult if not impossible.

Underexposing your screens is kind of like putting only 10 lbs of air in your car tires.

You did fill up the tires faster and the car still rolls, but doesn't drive well in critical situations and the tires wear out quickly causing the car to stop! Exposing emulsion is the same. Put too little quality UV light into the emulsion exposure and yes you can image a screen faster but it won't handle well on press, and it will wear out sooner stopping production and it will be hard to reclaim if you have used solvent cleaners!

Murakami Emulsion resolves details at full exposure, expose the quality completely and your screens will reclaim easily and your images and production yields will be the best they can be.

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