



Better Screens Mean Better Production A Screen Makers Guide

Bob Sherwood of Davis International outlines below how superior screens lead to more production on press. Bob will cover topics including proper mesh selection and tension, emulsion types and application, determining proper exposure, reducing press setup, film requirements and more.....

The first word in Screen Printing is **SCREEN**: Yet, I have seen countless companies first invest in the latest: Pre-press, press, drying or fulfillment equipment, while at the same time ignoring or minimalizing the importance of the **SCREEN ROOM**.

In construction, a strong building requires a strong **FOUNDATION**

In screenprinting, your foundation is a good screen.

When I am invited to a Screen print shop, the first department I ask to see is Screen making. I do this simply because this is the area where I can immediately assess capabilities and am able to observe weaknesses (or strengths) in the foundation. From there I can make my first informed recommendations that will have a direct impact on the shops bottom line.

Variables create **DRAMA**. Screen Depts. do not need **DRAMA**. Eliminate variables, eliminate **DRAMA**. I am fond of the six “P” expression: P.P.P.P.P.P. (Proper planning prevents particularly poor performance).

The room itself sets the stage for success: Remember, screenprinting is not messy, screen printers can be. Your goal is a clean, organized; light safe and easy to maintain facility. Think work-flow and air flow, a dry room will most efficiently evaporate water. Air conditioning and or a de-humidifier are recommended. Every professional screen dept. should have a plainly visible, combination thermometer and hygrometer. Fabricate with as many non porous surfaces as possible to reduce dust and expedite drying. In a perfect world, separate your water wet screens from emulsion wet screens. Water wet is following reclaim and degreasing and does not require light safe conditions. Emulsion wet is following emulsion coating and requires light safe conditions. Emulsion dries significantly slower (if at all) when the air is full of moisture. Moisture will spread from your nearby sink or reclaim area. Do you have room to separate them? Most screen rooms could benefit by simply having a hair dryer to expedite the occasional emergency screen. If your screen volume dictates, consider a drying cabinet for fast efficient drying.

Light Source: With the exception of the new multi spectrum L.E.D bulbs. Lamps of all types weaken with age thereby directly affecting the expo time.

An integrated light source does compensate for the failing bulb however the exposure time does increase.

Is your glass clean?

Is your vacuum working properly?

Is your lamp correct for your emulsion type and at the proper distance?

Do you have back-up bulb(s)?



The Sink:

Should be large enough to handle your largest frame comfortably & Backlit for easy viewing during washout. I have been in literally hundreds of screen rooms & have never worked at a sink that was too big but plenty that were way too small.

The Screen:

Whether you use wood, aluminum or retensionable frames there are fundamentals which are universal to all. Specify a quality sturdy frame capable of maintaining tension and withstanding production stresses.

Tension: For predictable and profitable results, tension should be uniform and consistent.

For example, I would prefer to have all my 200 mesh screens at 24 n/cm rather than one screen at 30 n/cm, another group at 18 n/cm and the remainder somewhere else.

Have you ever seen how color or opacity changes with tension?

Among other benefits, equal tension means equal off contact distance which aids in predictable, repeatable and profitable set up.

Set parameters & follow them. Do not expect great results from mediocre tools or methods.

Replace sub-standard frames immediately with frames that will perform at the highest level.

Stencils For this discussion I will only reference Direct Emulsion & Capillary Film stencil systems.

Prep your screens properly:

New polyester or nylon mesh may need abrading, all screens including stainless steel need degreasing prior to stencil application to remove unwanted contamination whose sources include actual fabric manufacturing, operator handling (oils), chemical contamination from inks, solvents and reclaim procedures and possible environmental contaminants such as dirt and dust etc.



Direct Liquid Emulsion:

Be prepared: If applicable, sensitize the night before and date the container to monitor freshness.

Do you need emulsion with higher resolution, faster exposure, higher solids, and solvent or water resistance?

Emulsions are formulated to meet your needs. Which one is best for you?

Your coating station should be stable and at the appropriate height for your screen size and operator.

Keep the station clean. When emulsion spills or drips clean it up ASAP (yes even when it lands on the floor)!

Clean scoop coaters right away after usage.

Be aware that scoop coaters can have sharp and rounded or even both round & sharp edges.

Be consistent when using them because by design each edge deposits different quantities of emulsion.

Pay attention to the edge keeping it smooth, free of dents and gouges.

Always check the edge before coating.

When coating, do not attempt to break the land speed record. Allow the liquid emulsion time to flow from the coater to the mesh.

You are absolutely obligated to experiment with various coating passes such as 1+1, 1+2, 2+2, 2+15 etc to obtain the best possible results or emulsion over mesh (e.o.m.) for each specific mesh count & task.

The proof is in the print!

Despite the number of passes, your last coating pass is always on the squeegee side forcing the emulsion to the print side.

Keep the coater edge fresh with a damp sponge or rag when coating many screens.

Avoid putting emulsion that has sat in the coater for a period of time back in to the container.

Do not use cardboard to scrape emulsion back in to the bucket.

Cover the bucket.

Store emulsion according to the manufacturers recommendation, not too hot or cold.

Drying: Once a consistent stencil is applied, it must be dried thoroughly.

Gravity is your friend:

Dry your liquid emulsion screens horizontally with the squeegee side up.

Dry your capillary film screens horizontally backing sheet up.

Emulsion is completely dry when all of the water is removed from the total emulsion thickness.

Consider the Tomato: Dry on the outside, wet on the inside.
Are your screens completely dry prior to exposure?
Like the tomato, emulsion dries from the outside to the inside.



Capillary Film:

Emulsion on a sheet! Very fast turnaround time & provides predictable thickness with great edge quality. No messy liquids, EZ to apply, various thicknesses for different mesh counts.

Exposure Calculation: Most screens are under-exposed vs. over-exposed due to latitude.

Once your screens have dried thoroughly, proper exposure must be determined for each mesh and or coating. Proper exposure can only be determined if the screen is thoroughly dried (remember the tomato).

Screens that are not thoroughly dried exhibit symptoms of under-exposure.

Screens that have expired (stored too long, exposed to heat/light) exhibit symptoms of over exposure.

This is why we always use freshly coated & thoroughly dried screens for any expo calculations.

Various mesh counts result in varying e.o.m and require different expo times.

Dyed mesh reduces the fiber-optic effect of white (clear) polyester by absorbing light, resulting in increase of expo time by about 50%. Example 110 white 100 units, 110 dyed 150 units

Dyed mesh is used to achieve sharper images by producing less light scatter.

Invest in a quality Exposure Calculator.

When to re-test: Re-Test when seasons change as weather affects exposure via humidity also, changes in coating method, emulsion change, new or additional mesh count, new lamp(s) or expo unit.

Film Positives: For best results especially when attempting to reproduce halftones, fine lines or tight registration, the film must have high D-Max & low D-Min. In other words the black should be as black as possible and the background should be as clear as possible. This is not an issue with C.T.S. systems. Laser generated Vellum does not exhibit these qualities, often resulting in exposure compensation (under), and difficult wash-out.

As a result the stencil is weak, prone to break-down & difficult to reclaim.

Mesh Selection: In an effort to direct customers to the next level, I am obligated to & have questioned customer's methods & challenged their processes and procedures. Many times shops can not justify why they choose to use specific mesh counts on a daily basis. My established method of justifying mesh selection involves actual on location print comparison. Following printing of a test image on a range of meshes, a blind comparison of the prints is performed to see which mesh option looks best; often the best print does not utilize the mesh or mesh combination which they have been using.

In closing, keep in mind that a chain is as strong as its weakest link and to achieve the best possible prints, cooperation is required between all departments including art, screen, production & management and that "Great Screenprinting does not happen by accident".