SCREEN PRINT PRECISION – PART 2

In the second part of Kieth Stevens' article to achieve cookie-cutter precision screen prints, he offers further advice regarding the importance of the right conditions of the print shop and how to get the best out of your 'tools'

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In part one, I offered advice on the importance of the correct mesh, squeegees, emulsion and inks to get the best out of your screen prints. Each of these basic screen-printer's tools can make or break a screen-print shop's production speed, quality and/or profits.

I will now delve into the next set of important 'tools' or conditions your shop needs to control. When aiming for cookie-cutter precision, if you try and make the same 'cookie' but the variables keep changing, then the results will be inconsistent. To make 'good cookies' it is essential to stop and control the variables, by keeping what works and fixing what doesn't.

KEEP IT CLEAN

First things first. In the screen/dark room, it is essential to mop the floors and wipe the walls on a regular basis to remove any dust and dirt that may have accumulated. Include any tables, printing surfaces, shelves, etc., as well as the print room floor. Why do I consider this to be important? Granted, many customers may never set foot in your screen/dark room or printing area, but dust and debris can get mixed in the emulsion, screens clog up and printing machines and dryers can malfunction as a result. I've also found that the cleaner the work environment, the more products can be printed, increasing the profitability of the company.

REMOVE MOISTURE

Now that you have a clean screen/dark room you can be proud of, you need to ensure that it is dry. When you coat your screen with direct emulsion and place it in the drying room, emulsion will evaporate the water it contains into the air. If you don't have a way to remove the added humidity, your screen will not be bone dry (as it needs to be). Purchase a dehumidifier and, if you can, pump some of your office air-conditioned air into the screen room. This functions well, because the air has been filtered and conditioned. In this case, be sure that the AC unit has a filter and replace or clean it regularly.

A coated screen that is not completely dry before exposure may result in premature screen breakdown during the production run. The film/glass can also stick to the emulsion after exposure and will ruin the film and screen, or worse. If you are using water-based emulsion and ink, and if the screen isn't dry all the way through to the centre, the water-based ink can eat away at (dissolve) the emulsion and cause premature break down.

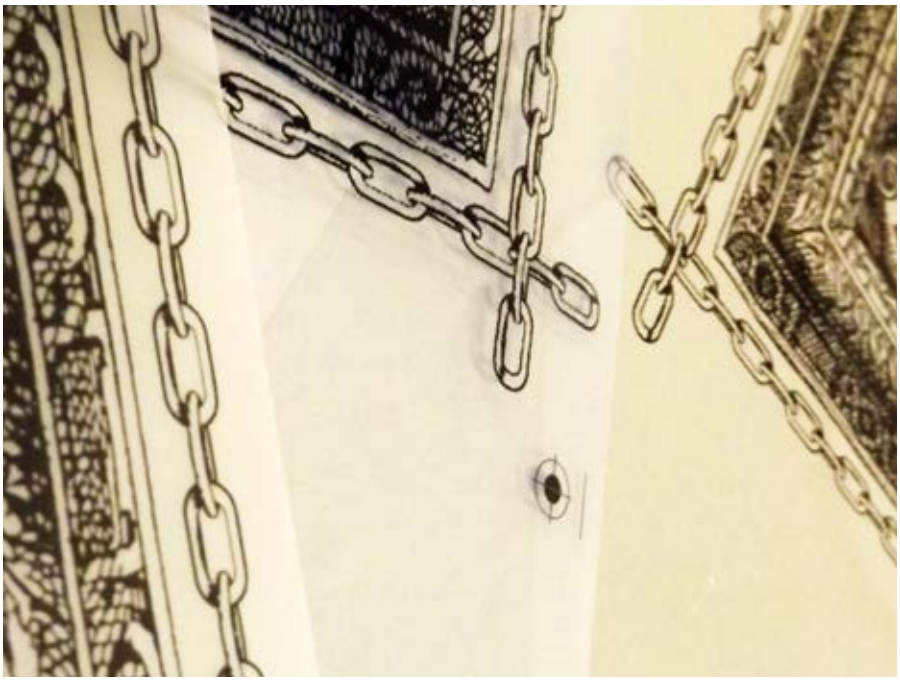
AVOID WHITE LIGHT

In regards to the screen/dark room, white light is a cancer. Any unfiltered light reaching your screen prior to exposure will cause trouble whether you know it or not. To test, take a freshly dried, coated screen and tape a coin to it (in the normal image area). Leave it on the top of the drying rack for a week in the screen room. Wash the screen off at the end of the week (without further exposure) and, if you notice that the area where the coin was washed off before the rest of the screen, the emulsion is slowly being exposed in your screen room. Do whatever it takes to make a dark room dark and use lights that filter out – or do not contain – the white light spectrum.

"To make 'good cookies' it is essential to stop and control the variables, by keeping what works and fixing what doesn't"

Continued over

Dark room walls painted black to minimise light bouncing off any light-coloured surfaces (left)



Note the difference in opacity of the black print between using vellum, Ortho and inkjet-printed films

"Purchase a dehumidifier and, if you can, pump some of your office air-conditioned air into the screen room"

SHIRT SIDE DOWN!

Now your screen/dark room is ready for action. Be sure to get a proper drying rack for your screens. Once you coat your screens evenly with the emulsion, they must be placed on the rack to dry with the SHIRT SIDE DOWN. I can't tell you how many times I find that a shop's coating techniques are perfect only to find that the screens are drying upside down. Always dry the screens horizontally with the shirt side down and the ink side up.

FILM QUALITY

In regards to film, take a look at your imaged film (one with the dark positive image on it) and hold it up to the light, preferably sunlight. Check if you can see through the black dark area of your film. If you can, your film is not as dark as it should be. Back in the day, when we were using real film and diazo old-school emulsions, we had a very large window of exposure. The film was as black as coal, no light shone through and the emulsion was very slow and forgiving. With today's quick-exposing emulsions, you have to be extremely careful not to have any source of light. I even turn off the wash-out booth light to prevent any excess exposure, at least until the image is mostly washed off. Big design areas may not be as much of a problem as fine lines or half-tones.

PALLET PREP

If you are using a flash during production, the pallets will heat up from the use of the flash. When starting a fresh run, warm up the pallets by running them a few times under the flash. Keep in mind that shirts may contain extra moisture which the flashes, during printing, can help to remove. This process helps with the overall drying process and, on cooler days, may help the ink to flow better.

One variable that needs to be monitored is the moisture content in the shirt. If, after curing, the ink cracks –even though the drying time and temperature was kept constant – the issue might be excess moisture in the shirt. Humidity in the shop due to the weather, for example, can force the dryer to work harder to compensate. If you break for lunch, continue running the pallets under the flash to maintain the constant pallet temperature, or restart the process to warm up the pallets when you return.

INK TEMPERATURE

I've mentioned various tips in my previous article on inks, but wanted to mention some good practice points for storing inks. Just like butter, the colder the temperature, the harder ink becomes. This is true of plastisol in general. I recommend storing ink products in a cool place to make sure that they don't get too warm or too hot. I'm not sure if there is a real problem if plastisol gets too cold, but there is a very real problem if it gets too warm.

Heat activates the ingredients in the ink to form strong bonds. At elevated temperatures, the ink can gel or become partially cured. Store inks away from heat sources such as heaters or sunny windows. If you are transporting ink from the store during the summer months, beware of prolonged heat exposure in the vehicle.

KNOWING YOUR 'TOOLS'

Now, let's assume you have made all the right decisions based on what you know for the average job. The job is set up and the registration is spot on. The inks seem perfect and the garments are laid out in correct size and colour. Screen mesh selection seems perfect, screen exposure is ideal. The test print comes out good, but, for example, you wish the print had a little more of the blue, or the yellow seems too strong. What can you

A simulated four-process print using primarily fluorescent colours with black and whit

A black PVC curtain door with an amber window. Black gaffer tape attached to the outside of the door shuts off any cracks to prevent light entering

do at this late stage?

In order to successfully navigate the minute variations of screen printing and stay flexible, you need to intimately know your 'tools'. I'm not talking about saws or wrenches, but the basic use of your screen-printing tools such as mesh, squeegee, emulsion, etc. Knowing what each one does and how to adjust the use of one or a variety of these tools is where money is made or lost.

"Do whatever it takes to make a dark room dark and use lights that filter out – or do not contain – the white light spectrum"

If you wanted to increase a blue ink deposit a bit, you would swap the blade to a softer one. In general a softer squeegee deposits more ink. Similarly, to lessen a yellow ink deposit, try to reduce the squeegee angle or change the squeegee blade to a harder one. The weight or thickness of your substrate can also affect ink deposit. I have found that a softer, thicker fabric may allow the squeegee to deposit more ink than when the material is thinner. You may find that these simple and easy squeegee adjustments will make the quickest and most drastic change in ink

Coated screens stored shirt side down to get the best emulsion coverage

deposit and opacity.

Do not underestimate the power of the flood stroke. Some printers think it's just moving ink around so you don't run out of it at a particular design area. But in reality – big secret! – the flood stroke floods ink into the screen image to prepare the ink for application. Printers in the solvent world would not, and could not, function without the proper flood stroke. The solvent inks will dry out if the screen is not sufficiently coated between strokes. The print stroke is an inherent part of the 'cookie-cutter' process.

PRINTING MONEY?

Consider your machine prints money. You want to make sure to keep it running efficiently and at maximum capacity as much as possible. Map out your processes and be prepared for the most common eventualities – things that can be easily replaced such as bulbs for your flash or squeegee blades.

Be sure to keep new squeegee blades (or other replacement parts) handy in case you need to switch to a different durometer blade or it might be cracked, nicked or otherwise damaged. Squeegee blades are relatively cheap, but if you don't have the one with the right durometer or a clean one ready, it can negatively impact your profit margins.

HYPOTHETICALLY...

If you are on the press and you need to change a squeegee blade – say for a harder durometer – you would not want to stop the press to have to clean a squeegee in the right durometer. Wasting time cleaning a desired squeegee while the press waits is a sign that you are not being as efficient as you could be. What's the big deal?

On an automatic machine that could print 500 prints an hour, how long do you want to delay printing? Five minutes to clean a squeegee at an easy 0.5 per print

"Always dry the screens horizontally with the shirt side down and the ink side up"

will cost you $20 for the wait. Stop a press three times a day, that increases to $60 less income per day. Multiply that by five days/week amounts to $300 per week, $1,200 per month or $14,400 per year of lost income. That's for just 15 avoidable minutes a day that the press didn't run. You can review many things in your shop to save a minute here and there.

PREPARATION IS KEY

Setting up a print job, you would need to assess the type of substrate to be printed as well as the type of design. Does it have half-tones or is it solid? Has the customer asked for special effects? With this knowledge, you can choose the ink type depending on the substrate, emulsion type, screen mesh per colour/type of ink and squeegees. Once you've set up your screens and loaded the pallets, prepare the pallet temperature and run a test print. This will show if any other adjustments need to be made for humidity (excess fabric or weather-related moisture). The dryer needs to be set based on fabric, inks (low-cure or standard) and humidity level to fully cure.

MAKE A NOTE

Another aspect to consider, whenever you feel you have knocked a job out of the park, is to write every step you made to achieve that success so you can repeat it. Document any changes made, however subtle, that

"Do not underestimate the power of the flood stroke"

achieved that 'cookie-cutter' job, as well as things you might have done differently. Keep a log book nearby so that you can add and refer to it for next time. It's ok to struggle to get somewhere once because you may not know the way, but when you know the route, you should easily find your way again. ■

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