

waterless lithography

Note 1: This information is based on a description of waterless lithography by Ross Zirkle, published in *Printmaking Today*, spring 2000.

Note 2: The dry copier toner process for lithography was developed & perfected by Nik Semenoff in 1985. He demonstrated it at the 1990 Tamarind Symposium in Albuquerque, NM. In 1990, he developed a process to make waterless litho plates from common aluminium plates by using ordinary caulking silicone.

Note 3: The text was updated in September 2017 with additional observations from a pamphlet on Waterless Lithography by [Annie Day](#) of the Printmaking Sisters.

INTRODUCTION

Waterless lithography is a technique which allows the artist to create a successful lithographic image quickly. Second hand aluminium commercial offset printing plates may be used. A silicone mixture applied to the plate repels ink instead of water which is used in the more traditional stone lithography. The benefits of waterless lithography are that the plates may be re-used a number of times, they may be printed by hand or by press and the technique uses less-toxic materials.

THE MATERIALS

- Plate
- Clear silicon seal - unpaintable silicone (roof & gutter) and odourless solvent.
- Odourless paint thinner
- Drawing Materials
 1. Staedtler Omnichrom - a water-soluble pencil sold in drafting supplies and some art stores. Used for drawing effects.
 2. Sumi Ink - an inexpensive black ink. Can be modified with dextrin or other water-soluble glues to make it impervious to the silicone. Used for pen lines or solid flats.
 3. Toner - dry copier toner washes used for reticulated textures - toner mixed with Isopropyl alcohol is excellent. Compressed toner can give charcoal effects.
 4. Water-Soluble Pencils - there are a number that can work, but they have to be heat set or they become soluble in the silicone/odourless paint thinner mixture. Even some washable felt markers will work if heat set. As the drawing materials are heated they at first take on a glossy look, and then become dry as the image is bonded to the plate. Experimentation with the pencils, crayons and felt markers readily available is a good idea, as many may work.
 5. Caran D'Ache Neocolor II - a crayon that produces a darker mark but is slightly affected by the coating solution unless heated.
 6. Ballpoint Pens - will produce a beautiful thin line when used with the smooth backs of reclaimed plates. The images have to be heated to resist the application of silicone.
- Gum Arabic - used to block out white areas or 'flats' can provide a variety of tones and effects. After applying the Gum Arabic, spray the plate with spray paint as for aquatinting. Spraying helps hold water-soluble drawing materials in place while using toner washes. The spray paint needs to be hardened on the hot plate or with a hairdryer but be careful not to burn the Gum Arabic or it will not wash out. Gum Arabic flats need to be carefully washed out before the silicone is applied.
- Toner Wash - a toner wash can be made by mixing used photocopy toner with Isopropyl Alcohol, toner with One Go floor polish (but should be fused to the plate with heat, and needs to be washed out with acetone, because the heat will change the nature of the toner wash), or toner with water and a drop of dishwashing liquid.

THE PROCESS

The silicone mixture

In a small container combine unpaintable silicone (roof & gutter) and odourless solvent mixing to a light maple syrup consistency.

Because the silicone is very thick as it comes from the cartridge, it must be diluted to a usable solution. Odourless paint thinner is the best solvent and available in Art Supplies stores. Use a small container with a tight cover if the silicone will be used over a few days. Start by adding only a little solvent and stir it in. Add solvent to the silicone and mix into the proper consistency (very light syrup).

Amounts vary widely with different brands of silicone. Try using a battery-operated latte stirrer for mixing - stamp it up and down while switched off until the silicone is well-dispersed then turn on the mixture to finish keeping the spinner below the surface. Add more odourless solvent when needed. Mixture should be made outside or in a fume cupboard.

Applying the silicon mixture to the plate

Flatten a roll of smooth toilet paper by removing the core. Pour a small amount of the silicone mixture (about the size of a 10cent piece) onto the plate and lightly work all over with the flattened toilet roll. Polish the silicone off with clean tissue avoiding finger-marks. Use even, light sweeping movements. Keep the toilet roll flat.

Discard the used tissue and repeat the process making sure all the plate is covered in a very thin coat of the silicone mixture.

Curing the plate

Cure using one of four different methods:

- Heat the plate in an oven 30 minutes at 90 degrees Celsius.
- Heat the plate on an etching hotplate for 30 minutes.
- Cure over 24 hours or more - depending on the weather- at room temperature.
- A heat gun may be used to cure a large plate.

Creating a plate using water soluble materials

If using the commercial or coloured side of the plate clean it off with acetone if green, or if blue use ammonia. When using the metallic side, degrease the plate with a scouring pad and cream cleanser, rinse and dry. Draw on the plate using Omnichrom pencil and gouache. Apply the silicone mixture. After curing, wash image out with water.

Creating a plate using acetone soluble materials

Prepare the surface of the plate as above. Make an image using Sharpie pens, ball point pens, Future, Long Life or similar acrylic floor polish coloured with a few drops of food colouring or India ink. Paint, spray or apply media with a dip pen or brush. When the image is complete, apply silicone and cure the plate. Remove drawing media with acetone to bare the metal ready to accept the ink. Note: don't cure Sharpie or the permanent pens in the oven higher than 80 degrees as the drawing may bond with the plate and cannot be removed.

Many drawing materials other than those mentioned may **not work** with the waterless method so always test first to avoid disappointment.

Inking

Rubber based inks by Gans or Van Son are perfect for this process as the intense pigments stay open for an extended period. If using other commercial offset inks, test first as other inks may scum and be unprintable. Never modify the ink with easy wipe, smooth lith, linseed or plate oil - it will scum and be unprintable. To be effective the ink must be lean. Use a hard diameter roller or brayer - Essdee brand made in the UK is recommended.

Roll out a slab of lean ink. Let it stand to tighten up while the plate is curing. Sit the plate on a sub-plate. Start the roller on the subplate then roll across the plate diagonally, not stopping until the roller is completely off the plate. This rolling pattern is repeated until the plate is fully inked. Remove any scumming with a clean brayer. It is now time to move your fully inked plate to your press bed for your first impression.

Making a sub plate

A sub plate is essential for inking up the plates. It can be made with MDF board, sand blasted glass or plywood. A plate glass that has been grained and coated with the diluted silicone is a good sub-plate as it is perfectly flat. If the board is Melamine - coated, sand it well. Apply 3 to 4 coats of the silicone mixture to the sub-plate. This will repel unwanted ink and keep the rolling surface clean.

Printing

Smooth papers work best, however, any printmaking paper may be used. The paper can be dampened or dry. The plate can be printed face down or face up using an etching press. With these flat plates, cardboard can be used instead of blankets. Waterless litho plates can be printed on light weight Hosho paper with a baren.

Plate Storage

When printing or proofing is finished, do not wash the ink from the plate. The ink protects the metal surface from oxidization and it can be easily removed later with acetone. Keep the plate in a zip lock plastic bag. If you wish to use the plate again simply roll up with fresh ink. Don't clean off the ink before printing unless you are changing colour.

Plate Cleaning

The preferred method is to use VCA (vegetable cleaning agent). If cleaning rollers with VCA, work cream cleanser all over the roller after cleaning with VCA, rinse well then dry with a soft towel. Baby wipes are good for the final clean-up of glass and other surfaces.

TROUBLESHOOTING PRINTING PROBLEMS

If the plate is scumming badly, roll it vigorously with clean brayers to clean it up. Sometimes with just this step and some proofing, the plate will straighten up. The cause may have been that the plate was not properly washed out.

If the plate still is scumming badly then assume that the silicone may have been applied too thinly. Clean up your plate as much as possible by rolling it with small brayers. Then add another coat of silicone leaving ink in the plate to protect your image. Do not worry if all the non-image areas cannot totally clean up as they will clean up in the process of applying fresh silicone. Adding another coat of silicone will improve the ink rejecting property of your plate. If the plate does not take ink, roll slower and add a little downward pressure. If the plate still is not taking ink, the silicone may not have cured long enough before wash out. This would allow the silicone to travel from the non-image areas to the image areas causing the entire plate surface to reject ink. If small portions of the image are lost they can sometimes be replaced in another colour run or added back into the original plate by scratching away the silicone where it doesn't belong.

SOME REFERENCES

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