

ARTIST FILM WORKSHOP

Lomo Tank and Black and White Reversal Workshop Notes

The Lomo Tank:

If you have a new lomo tank, you will probably need to 'tune' the spirals before use. This involves ensuring that the spacing between the spiral discs is correct. For super 8, you want about a 9mm gap while for 16mm you want about 17 mm gap. Too much and the film will skip out of the track while loading. Too little and the film can't get in. You also need to make sure the space is about the same all the way around, not narrow on one side and wide on another. To tune the tank, use a chisel or metal ruler to scrape away at the hub as necessary, or put little pieces of duct tape or gaffer tape on the hub to pack it out the other way.

You should also cover the little drain hole in the spiral handle. If left un-covered, sure it stops the handle from filling up with liquid, but it also lets in a little spot of light. So cover it with some dark tape and don't worry about the drainage issue – it really is a non-issue.

Load the film in complete darkness (unless it is a lab stock of some sort). After hooking the start of the film into the slot at the hub of the spiral, put the rest of the spiral together. The critical thing in loading a lomo spiral is having the film on a 45-degree twist or more as it enters the spiral. To stop the film coming lose in the spiral, stick the spirals together with a little electrical tape in four places – one in each 'corner'.

Always add chemistry and water to the tank via the hose, not through the lid as poring through the lid risks dislodging the film in the track. Stick a funnel in the hose for adding liquid. Drain the tanks in the same way, holding the tank on an increasing angle as the liquid progressively comes out the hose. The hose connection is the lowest point inside the tank, so hold the tank to drain to that point.

Chemistry requirements for Black and White reversal processing:

Kodak D19 developer. Comes as a bag of powder to make 3.8 litres. To avoid backwards contamination in the process, it is preferable not to use a developer that has been used as the second developer in the sequence again as the first developer. Don't shake developer to dissolve. Stir or swirl instead. Best to dissolve the whole bag at once, then pour off what you need and stopper up the rest. Mixed up as a liquid, it can be kept in the fridge for longevity.

Using enough developer to cover the films in the spirals, the developer can be re-used 4 or 5 times for super 8 or 2 or 3 times for 16mm with small increases in development time.

R9 bleach. This is mixed up from potassium dichromate, sulphuric acid and water. R9 bleach is the dangerous chemical in the reversal process. Treat it with care. Clean up spills immediately so it doesn't get a chance to dry, turn to dust and enter the air. NEVER ADD WATER TO THE ACID. ALWAYS ADD THE ACID TO THE WATER. Use goggles or glasses and gloves and whatever else you have to keep yourself safe from the acid. Treat the acid VERY seriously.

All that said, there is no need to be frightened; as long as you treat the bleach with care it is no problem.

Use 9 or so grams of potassium dichromate and 12ml of 99% acid (or 17ml of 75% acid, etc) per litre of bleach.

Handle the potassium dichromate carefully. It too is a nasty (its carcinogenic). Use a mask when handling the powder – or at least do it outside. Dissolve the potassium dichromate in a few hundred mills of hot (not boiling, just hot) water. Then add the rest of the water. Then carefully add the acid. The acid will warm up the mix a bit. Can be used twice if processing 2 lots of film in a row, but otherwise it needs to be stored in a chemical bottle as it will eventually melt a milk bottle. If you aren't using it twice and don't have an appropriate bottle, just use it and dump it as it is cheap to make.

Clearing Bath. 10 grams of Sodium Sulphite dissolved per litre of water. Use twice.

Fixer. Any fixer for black and white film will do. I use Tetenal Superfix at a ratio of 1:4. To the fixer you need to add some Fixer Hardener. Tetenal and Ilford both make hardener. Usually it is added at a rate of 1:25. Can be used many times – at least 5 times for any reversal format.

Hypo Eliminator. This is optional. It comes in a Kodak 3.8 litre bag like the developer. Mixed and used as per instructions on the label. Working strength solution can be used for as many rolls as you are doing in a session, but doesn't keep. The dissolved concentrate will keep.

Photoflo. This is a wetting agent to help the film dry without drying marks. Also speeds up the drying a lot. It's basically just a detergent. Very cheap. There are other brands of wetting agent to Kodak's Photoflo. Use for the session then toss. This is the last bath, so you don't want to get grit or anything in the mix that will stick to the films.

The reversal process:

The only stage that is really time and temperature critical is the first developer. All other stages are 'process to completion' and you don't have to fuss too much about getting the time and temperature right. The chemistry is more effective at the appropriate temperature, so if possible, pre-heat all the chemistry to 20 degrees. The first developer must be at 20 (or 21 so that once it is in it will cool to 20) if you are going to use the 6 minute development time.

First Developer: 20 degrees, 6 minutes. Add 5 seconds for each subsequent use of the developer. This is the critical stage. It is best to have the tank sitting in a bath of water at about 21 degrees to pre-heat. If this isn't possible, increase the initial temperature of the developer to 21 or 22 degrees.

Just as time and temperature will effect the development, so does agitation. As soon as the developer is pored in, agitate up and down vigorously a couple of times to release any air bubbles, then continue agitating (more gently) up and down and side to side for about 30 seconds. Then agitate for about 10 seconds every 30 seconds until the time is up. Poor off the developer in time so that the wash water first hits the film at the 6 minute mark.

Wash. Needs a couple of minutes. This acts as a stop bath to stop the developer from working. With reversal, you can't use a normal acid stop bath as it interferes with the bleach. Better that the wash is too cold than too hot. Can just use water from the cold tap.

Bleach. About 2 minutes. I start the timer after the chemistry is in. Agitate well.

Wash. Not super necessary at this stage, but worth doing if you are going to re-use the clearing bath. Maybe a minute or two.

Clearing. About 2 minutes. Again agitate well.

Re-Exposure. People get freaked out about this one. Actually it is very simple. Open the tank (in the light), take out the spiral and immerse it in a plastic tub of water with a light suspended over or near it. Of course, watch out for mixing electricity and water. Best to keep the spiral moving in the water to ensure even re-exposure to the light. You can't really do too much of this. I do 1 minute per side of the spiral.

Second Developer. About 6 minutes. This is developing to completion so you can't do too much. Agitation is important in this one in order to get even development, especially in the first few minutes.

Wash. Can use a stop bath here, but why would you. Wash for about 2 minutes to avoid contaminating the fixer with too much developer. That is all it is for.

Fixer. Fix for about 6 minutes. Can't do too much of this. Bit of agitation is a good thing.

Wash. Needs a good wash at this point. This one is for longevity. As long as you can give it. 20 minutes of gentle washing is great. Alternatively, you can wash for 2 minutes, then put the film in Hypo Eliminator for 2 minutes, and then wash for 5 minutes.

Photoflo. The wetting agent. About 30 seconds.

Drying the film.

It's really a two-person job to get the wet film out of the spiral. If hanging the film on a rack, make sure the film is emulsion side out on the rack. Having the emulsion side of the film touching the rack will leave little marks on the film. The base side can touch anything. As acetate film dries it shrinks. Some provision needs to be made for this if you are pegging the wet film to a rack. At least you should slacken the film by hand after hanging. To speed up drying, you can expose the film to a non-blowing heater, or if you are desperate and don't mind a little dust, use a hair dryer. If air drying, it is best to wait a full 24 hours. Projecting a film while it is still 'green' (which doesn't mean wet, it means dry but still too fresh) can scratch it.