Fotospeed LD20 Lith Developer Lith Printing Instructions

Courtesy of Dr. Tim Rudman

Lith printing can be very rewarding, but it is time consuming and often frustrating, and you must be ready to ignore some of the normal principles of good darkroom practice. Heavily overexposed prints are processed in highly diluted lith developer by 'infectious development' and the print is 'pulled' prematurely to produce a variety of warm or coloured tones. Pulling the print is essential and critical to the outcome. Fotospeed LD20 comes with sachets of Potassium Bromide and Sodium Sulphite to assist in preventing 'peper fogging' with Fotospeed & Process Lith Paper. Instructions for use are on the reverse side of this instruction sheet. Lith printing has nothing to do with printing from lith negatives.

Infectious development

In normal development, if there is no agitation developer will exhaust, slow down and eventually stop working in the shadow areas, where it has to work hardest. The highlights and midtones continue to develop. As in water bathing, this can be used to control contrast. However, even with the vigorous agitation used in lith printing, infectious development causes the darker tones to develop faster. The darker these become, the faster they continue to develop, until an almost explosive rate of acceleration is reached in the dark tones.

Colour

Image colour in chlorobromide or bromochloride papers depends mainly on the grain size in the emulsion. In the early part of development the grains are fine and a variety of warm tones are produced. At full development the grains are large and the image is cooler; black or almost black. If you leave a lith print in lith developer until the completion of development you simply get a cold toned dark print; in other words, one that is heavily overexposed. However, infectious development allows you to snatch the print when the rapidly progressing dark tones reach the required density. The lighter tones are still way behind, but overexposure will have ensured that these are sufficiently dense. Removing the print at this 'snatch point' gives characteristic blacks in the shadows, while the lighter tones vary from buff to peachy pink or olive-yellow, depending on the paper and your processing technique. Because the light tone grain is so fine, it is possible to get wonderfully delicate, soft highlights at the same time as high-contrast characteristics in the lower tones. The effect can be striking. Alternatively, you can achieve high-contrast and heavy grain throughout the print — again depending on the technique employed.

Making the print

The following guidelines will give you a grasp of the basic principles of lith printing, but it is important to realize that this technique in particular lends itself to experimentation.

• Start with relatively strong solutions or you may find that you are still looking at a blank sheet after five minutes and give up. But note that such a wait is not unusual, since, depending on the required effect, temperature, dilution and exposure,development can take from 5 to 25 minutes.

• Fresh developer does not give the most interesting results. The best results will occur after a few prints. Alternatively, add old used lith developer(old brown) at 1:4.

• Overexposure of two or more stops is essential. Judge either by using a reference print taken to finality, or, more accurately, by using a test strip. The latter method is easier but not as easy as using a conventional test strip, since the strip must be snatched when shadow detail reaches the desired point, which happens at different times in each strip. Estimate the right time and proceed from there. The time intervals should be wider than those used for regular test strips. If you normally proceed in f-stop increments, use f-stop increments instead, and if you normally use steps of 10 seconds, try 30 seconds.

• Burning-in may be required in areas of minimal detail, although the overexposure already given will have lessened the need for this.

• Dodging is less critical as the print is snatched when shadow detail is 'right', but it may be needed in secondary areas. You can snatch only when one (the most important) area is ready.

• Flashing is still useful to pull in faint highlights, but cannot be assessed as accurately as when developing to an end point with a flash strip.

• Development may be long and constant agitation is essential. Never be tempted to leave the print face down and do something else, otherwise different depths of developer caused by the dish's construction will cause patterns on the print. After a while a faint milky image appears and very slowly builds up. This may severely try your patience if you are used to the instant response of resin-coated paper.

• Assessment can be difficult because you are seeing faint pink or sepia tones under red or amber safelights. This problem is made worse by some graphic-arts papers, which have a milky film that only vanishes in the stop bath or fixer, suddenly revealing what you could not see in the developer.

• Watch for the emergence of a dark tone. This starts to accelerate and at this point a safelight torch is invaluable. At the appropriate moment, slide the print swiftly into the stop bath. Do not hold it up to drain from the developer or the critical moment will have passed.

• Fix and wash the print carefully. If scum marks appear, soak in a 3% acetic acid and then rewash it thoroughly.

Controlling the lith process

Most darkroom enthusiasts are interested in two aspects of any process first, how to control it to yield predictable and reproducible results, and secondly, how to exploit it, vary it and extend it's possibilities. Lith printing will challenge and appeal to such people. It has a reputation for being difficult to control and impossible to reproduce exactly, and it can be manipulated to produce effects ranging from subtle and delicate to the outrageous.

Proceed logically, changing only one variable at a time. Keep notes and analyse what you are doing, as this helps to make the process more predictable. Also bear in mind the following points, which will all help to put you in control.

• Dilution of the developer substantially alters the lith

effect. Start with a relatively strong solution - for example, Fotospeed LD20 Lith Developer part A 1+14 and part B 1+14 with water and then mix together. To increase the effect, increase dilution to 19 or 24 parts water or more, adjusting exposure and development time.

• Expose for mid or light tones, depending on which are most important in the final print. Develop for shadow details. Watch them carefully and snatch the print when they are ready. Remember that you are dealing with infectious development here, not normal development. If the mid or light tones have not come up enough at the snatch point and after dry down, try increasing exposure by 50% or l 00%.

• Contrast is controlled by development time and exposure. The longer the development, the higher the contrast.

• Timing depends on the desired result and the state of the developer, which usually exhausts quickly. Ignore the clock and watch the critical shadow area you want to control.

• Tone or colour can be affected by most of these variables as well as by different papers, different developers, flashing through development, bleaching and redevelopment, and subsequent toning. Experiment with these effects - the permutations are endless. Fresh developer may give less interesting tones or colours than used developer. The addition of stored used lith developer is a favourite ploy to overcome this problem. Try a ratio of 1:4 used lith developer to fresh developer.

• The capacity of developer is very limited at these dilutions, and can fail quite suddenly. Be prepared to discard it when development times extend, but keep a little used lith developer for the next batch. For consistent results you may need to do this often.

Late-development flashing

As it can be difficult, under amber or red safelights, to judge the progress of a lith print, with its characteristic pale colours, an LED torch is invaluable. Alternatively, because of the long development times, flash on the room light very briefly when approaching the snatch point in order to assess progress. The print will not stay in the developer long enough to develop fog because the light tones appear much more slowly than the rapidly accelerating dark tones. This technique can be used with care at the end point without significantly affecting the image. Further experimentation, flashing progressively earlier in development, for different lengths of time, reveals interesting results with some materials.

"PEBBLE"/"PEPPER" FOGGING

with Fotospeed LITH, Sterling Lith and Process Lith Papers.

Some users have reported persistent "pepper" fogging with these papers when printing continuous-tone prints using dilute Lith developer. This is especially a problem using Champion Novolith, although it can also occur with Kodak RT and Fotospeed LD20 Lith developer.

It is believed that "pepper" fogging arises because, during development, an oxidation product of hydroquinone (present in both developers) causes early fogging of some grains. Infectious development then commences, and the result is as if someone had shaken black pepper across the print. This appears to arise because the preservative (usually sodium sulphite) and restrainer (potassium bromide), assumed present in the stock developer, are diluted down beyond the maker's intended concentration in order to get continuous tones from lith paper.

The cure is to add sodium sulphite to the working solution, either on its own, or in combination with potassium bromide.

From tests, the amount of additional sulphite required to inhibit pepper fogging is around 20-25g per litre of A+B concentrate (ie 500ml A + 500ml B). However, further oxidation of the hydroquinone in use can cause fogging on subsequent prints, so a higher amount is recommended.

It is suggested that you conduct your own tests to determine how much sulphite is required. This will vary according to which developer you use, how much you dilute it, and how much the sodium sulphite you use has "gone off" (anhydrous sulphite forms a layer of carbonate and sulphate on exposure to air, which is non-harmful to the process.

The best way to achieve this is to make up a 10%w.w. solution of sodium sulphite. by dissolving 5Og of anhydrous sodiumsulphite in 300ml of warm water, and adding cold water to make 5OOml. (NB sodium sulphite solution does not store well - keep in an airtight bottle).

This can then be used in varying amounts to establish the point at which fogging is eliminated. As a guide for your own tests, typically about the same volume as of Part A developer will prove adequate (equal to 50g of sulphite per litre of A+B concentrate). For example :

1 part 10% sodium sulphite stock solution
1 part Novolith or Kodalith or Fotospeedlith LD20 Dev A
1 part Novolith or Kodalith or Fotospeedlith LD20 Dev B
16 parts water (very adjustable between 4 and 20 parts, depending on effect wanted)

If pepper fog is not completely eliminated, add 20% more sulphite solution and try again. Beware that if you add too much sulphite you will eliminate fog, but prints will be flat in contrast with degraded maximum black. Aim for a mid-point between that where fog is just eliminated, and visible degradation of contrast begins.

A further consideration is the addition of restrainer (potassium bromide). This also inhibits pepper fog formation, but not to the same extent. It also affects image colour - addition of 1 part 10%w.w. potassium bromide solution (i.e. 5Og KBR in 5OOml water) to the above 10% sulphite+LD20 working solution changes the image colour from pinky-sepia to a yellow-sepia. Bromide also extends development times considerably (by about 2x - to around 25mins with 1+1+1+1+16 dilution), but the extended time produces a stronger "lith" effect, with good contrast and solid neutral blacks.

Note that if you add potassium bromide, somewhat less sodium sulphite could be used for pepper fog supression.

Processing Lith Film With LD20 :

Dilute A & B 1+3 with water and mix together to make the working solution. Process at 20°C for 5 minutes. Depending on the film used some adjustments to time may be necessary.

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