

MOERSCH

SPECIAL EDITION 5 LITH

SE5 has been formulated specially for Lith printing. With the two concentrates and additives C & D (optionally E as shadow area accelerator, grain additive) the optimal working solution for all 'Lithable' papers can be mixed. Note: Additives D & E are highly concentrated – dilute 1+4 with water (see table) before use.

Lithable papers are those with Chloro-Bromide emulsions without incorporated development accelerators such as phenidone. To test whether a paper is lithable carry out the following: Sprinkle strip of the paper under normal room lighting with the B solution. If nothing happens after 2-3 minutes (or if traces of pink or brown appear) then either it is clean or contains only hydroquinone and is worth trying. If blacks appear, particularly if they appear suddenly, then a development accelerator is present which renders the paper useless for lith processing. The only remedy is to try by thoroughly washing the paper first to remove this component.

Suitable Lith papers, listed by difficulty:

Best results, distinctive colouring:

Fomatone/Rollei Vintage 131/132 and all those Forte-Warmtone emulsions such as Polywarmtone and Fortezo that are still available.

Somewhat less colorful:

Kentmere Kentona with green-black shadows, Fotospeed Lith with saturated blacks.

Creamy beige:

Agfa MCC und Adox MCC

Greeny-yellow or reddish yellow highlights, saturated, grainy blacks:

Fotokemika Varikon, Adox Fine Print Classic VC

Brown – red/brown highlights, deep shadows, grainy in the middle tones:

Fotokemika Emaks, Adox Nuance, Imago Lith

Yellow to reddish-yellow highlights, brown/ green-brown shadows:

Kentmere Fineprint Warmtone, Wephota BN112

Difficult to lith, only recommended for experienced Lith printers:

Iford MGWT, Bergger Prestige VCCB

Very grainy, with a distinct tendency to peppercorn:

Fomabrom Fixed grade papers (after 2002) Fomabrom Variant III, Rolleil Vintage 111, Slavich

Working solution preparation:

Example: Fomatone

1000ml Water + 25ml A + 25ml B + 15-20ml D

Before adding D take 100-200ml of developer for later use as a regenerator.

If the conventional, non-lith exposure time is not known, the inexperienced user should determine this time using their usual paper developer and with the smallest aperture (because of the Schwarzschild effect). Note this time and open the aperture 3 stops. The lith developing time is now expected to be between 6-8 minutes.

Agitate the print continuously in the developer and take care to ensure the print stays submerged to avoid dry areas caused by the print floating to the surface. Develop by inspection at least towards the end. So: emulsion side up, don't worry about fog and keep the print moving. For a while nothing will

appear to happen. The image will start to appear – with a few exceptions – between two and four minutes. With high dilutions and high amounts of Bromide the image will take a very, very long time to develop. This is absolutely necessary in order to maintain many colours (yellow-brown, ochre, redbrown, pink) as well as tonal differentiation in the highlights. After half the expected development time has elapsed there should not be any predominant appearance of highlights or shadow differentiation, the shadow areas should not appear too quickly or the 'lith-band' (areas of unstructured shadow) will be too broad in the final print.

The image will appear to be flat and weak right up to the end then the semi-quinone kicks in and starting in the deepest shadows the modulated blacks start to spread, tentatively at first and then ever rapidly from one Zone to the next. The correct 'Snatch point' at which development is arrested can only be determined by experience. Now's the time to decide, with some papers, whether it does in the bin or frame. Finished? Out! Stop bath! Agitate! Don't stop to let developer drip off the paper – better to renew the stop bath more often.

Increase temperature to 24°C or more speeds up the whole development process without any detrimental effect upon the result.

The following fundamentals hold true:

The more light, the warmer the highlight and middle tones with a softer gradation. This is conditional on extended exposure times of over a half of 1 stop, the best match of both developers to the paper in terms of dilution or by the addition of more Bromide (starter), otherwise the image develops too quickly with the highlights tapering off before the infectious development of the shadows can get going. The longer this infectious development is delayed, the more intensive the effect.

Impatient worker can now get going. Those wishing to learn more may read on.

An understanding of the action mechanism is an absolute requirement for **fine calibration** and optimum **regeneration**. A detailed description of the complex processes would exceed the framework of this introduction (for more information, we recommend Tim Rudman, *The Master Photographers Lith Printing Course* ISBN 1-902538-02-1), so here only the most important things in brief. The trigger for the "infectious development" is the formation of semiquinone during the development process. Semiquinone is an intermediate oxidation product of the development substance hydroquinone, which is normally "picked up" by the antioxidants (such as sodium sulphite) contained in the developer. For this reason, lith developers cannot contain more than traces of free sulphite, which unfortunately has adverse effects upon the working life of the solution. The rapid formation of semiquinone in this developer is enhanced by an additive. For that reason, the often-recommended "inoculation" (addition of used, heavily-oxidized solution) or "maturing" (starting semiquinone production by developing a strip of exposed paper) of working solutions is not necessarily required; even the first print will be dependably "lithed". These methods are nevertheless useful for stabilizing the developer; otherwise one cannot count on reproducible results until after the third print has gone through. Barriers of different levels of effectiveness can be constructed to prevent the semiquinone from kicking in too soon in the development process. In addition to other restrainers, bromide is generally used in this regard. It is not able to begin to be effective upon the partially-developed silver molecules until the semiquinone content of the developer has exceeded the predetermined threshold level of the user's choice. Then, however, its effect is very sudden, equalling in its effect a second, superadditive developer substance.

Lith developers which are severely exhausted, particularly those with extremely high dilutions, reach the limits of their buffering capacity through acidic oxidation products. Sulphite is used up, alkalinity falls off, which leads to the situation where the highlights need more light than the semiquinone allows. An additional difficulty is the increasing amounts of bromide are released from the emulsion. For that reason, to ensure consistent print results, regular regeneration is required, at least with dilutions greater than 1+15. Regeneration type and quantity are also dependent upon the paper used. Normally, regeneration with a working solution of the same dilution (with either zero or reduced bromide additive) is sufficient. More on this below.

Adding

- + Solution A: harder, more colourful, grainier, slower, shorter working life
- + Solution B: softer, less colourful, faster, longer working life
- + Bromide: delays the onset of the lith effect, requires more light

+ Sulphite: antioxidant and darkening reducer, careful addition to avoid peppercorn

Working life: general specifications regarding lith developer working solutions are very misleading!
The following factors have an effect upon working life:

- 1.) Degree of dilution
- 2.) Composition: relationship A:B and additives such as sodium sulphite (C)
- 3.) Amount of use: fresh - used - used up
- 4.) Oxidation surface: bottle filled to the top or tray filled to the depth of a finger
- 5.) Developer quantity per oxidation surface
- 6.) Regeneration

In the formulation of SE5 more emphasis was placed upon having a large number of usable sheets of paper than upon having an extremely long tray life, the working life can always be enhanced by the addition of Solution C, if the paper being used permits it.

Example 1: Fomatone 1+10 without sulphite

500 ml tray	8x10 inch	without regeneration	5-8	8x10 prints	4 hours
1 litre	" "	500 ml total regeneration	12-20	8x10 prints	8 hours

Example 2: Fotokemika Varycon 1+10 with sulphite 20 ml/litre

500 ml tray	8x10 inch	without regeneration	5-8	8x10 prints	6 hours
1 litre	" "	500 ml total regeneration	12-20	8x10 prints	12 hours

A visual point of reference for the condition of the working solution is the colour. When freshly mixed, it is clear; as it is used it becomes yellowish to amber in colour. It must be regenerated no later than this point. When it reaches the point of being reddish-brown, monitoring is difficult; dark red means it's all over! Solutions that have been somewhat used (yellow) can be stored for a few days in filled, tightly-stoppered bottles.

Life of the Concentrates:

A full/half-full bottles at least 8/4 years

B full or partially-full bottles: unlimited life

C Sodium Sulphite solution: The 20% Antioxidant contained in the Kit is a stabilised mixture of different sulphites. In unopened bottles it is fully effective for at least 2 years, in partly full bottles the effectiveness gradually reduces as a result of slow but continuous oxidation. This can be avoided by the use of smaller containers, by squeezing a plastic container to expel the air or by the use of a neutral gas (Tetental Protectan) or cigarette lighter gas.

D, E, Ω Starter solution practically unlimited.

Regeneration: In the interest of consistent results, regeneration should be carried out regularly, starting with the 3rd-5th fifth print. The following types of regeneration are possible, depending on the paper used, as alternatives:

- 1.) using working solution of the same dilution (using half as much bromide as in the initial solution), either with 10% of the initial quantity on a regular basis or more on an irregular basis (during the process if need be, but then gradually adding it, accompanied by vigorous agitation)
- 2.) with diluted Solution B, in order to maintain stable pH value (in case the Lith Point moves downward too much) -- don't overdo it, start with small quantities and monitor effects!
- 3.) with Solution C: usually 2-5 ml is sufficient; considerable larger quantities are necessary with some papers in order to avoid peppercorn and "black dots".

TIPS AND TRICKS

Operating temperature: The normal temperature, as always, is 20°C. Temperatures under 18°C are unsuitable. The developer temperature can be raised to 25-28°C to shorten the process times. The speed savings when going from 20°C to 25°C is 40%. Bromide-rich solutions can be taken up over 25°C, although one must remember that elevating the temperature speeds up all chemical processes, meaning oxidation as well!

Formaldehyde, which usually appears in lith developers, has been dispensed with in this formula. That means that there are no unpleasant odours or emission-related health risks to be concerned about, even at high temperatures.

The temperature of the developer can be maintained with some degree consistency at 18-26°C in cooler rooms when the tray is placed upon 2 bottles filled with warm (30-50°C) water.

Two-bath development: Often the only solution for highlight definition + lith black with high-contrast negatives and papers with high levels of silver bromide.

Example: first developer with high bromide content (highlights hold, shadow areas develop without lithing), changing into second developer without bromide or sulphite, even perhaps with a slight excess of Solution A (more than 30-60 seconds is rarely necessary).

Toning: Lith prints are extremely responsive to toning. Selenium or gold toning (or combinations thereof) are even often indispensable.

It is undoubtedly selenium toner that offers the greatest variety of possibilities. Depending upon dilution and exposure time, one can just enhance the shadows or change their tonal colour, or one can alter all the tonal values in their print colour. Some papers, when lithed with a lot of bromide, show no maximum black. Selenium performs miracles with these, hard and fast (1+3 to 1+9, 10-30 seconds!).

Hardening: Some papers (particularly those with matte surfaces and factory-fresh emulsions) should be hardened before toning in aggressive baths such as cyan, sulphur or selenium (less than 1+15) when subjected to development times over 8 minutes, in order to avoid colouring in the picture highlights.

Gelatine hardening is possible as a general rule at all stages of the processing procedure:

- 1.) Hardening before development (alkali hardener): the disadvantage is the effort involved -- every print requires an additional three to four minutes of additional processing time
- 2.) Hardening additive in stop or fixing bath: advantage: standard-issue hardening additives on the market; disadvantage: increased water use through considerable prolongation of the washing time
- 3.) Hardening after fixing and brief washing with one of the well-known acid solutions, or with our special lith hardener. Disadvantage: extensive washing must take place once again before selenium toning, or the acidic paper felt must be neutralized in a washing aid

What else? The OFF switch for the lith effect

If one only wants the glowing colourfulness and finds the lith effect an apparently necessary evil, then just switch it off! There are two alternative methods available for doing this:

- 1.) Tiny quantities of any given paper developer: because, all the developers to be found on the market, except for a very few exceptions, contain at least two developer substances, the hydroquinone in the lith developer reacts superadditively with at least one additional developer substance and "lithing" is no longer possible. The print colour shifts more or less strongly in the direction of green.
- 2.) Large quantity of sodium sulphite: the precisely correct quantity, depending upon the paper being used, falls between 40% and 200% of the Solution A quantity.
Beautiful brown tones can be created with warm toned papers in particular.
Example: Forte PW: Dilution 1+8 tone brown and 1+15 tone reddish brown
Water 830 + A 60 + B 50 + C 50 Exposure +1 f/stop, development 6 minutes
Water 1600 + A 60 + B 50 + C 50 Exposure +2.5 f/stops, development 10 minutes

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