

Polychrome development Part 1: Lith + Siena basics

In a couple of publications in recent years I described opportunities of developing in colour on black and white paper.

The principles of coloured development

By means of overexposing and developing in highly diluted, slow developers with only one (!) developing substance, warm-brown to red-brown image tones can be achieved. You can increase the colourfulness of the image tone, by increasing exposure time. The higher the degree of overexposure, the higher a developer dilution is necessary. However, extremely diluted developers cannot generate the complete tonal range, the light tones are coloured and finely differentiated, but it is impossible to produce the black tones of the shadows. This problem can be solved by two bath development with lith as first developer.

The Polychrome-Kit includes two components of a Lith Developer and a concentrated Glycine Developer of low alkalinity, as well as a starter-solution (potassium-carbonate + anti-fog), an ammonium chloride solution to control the image hue and Lith D as an optional anti fog solution.

Preparation of the working solution

Use the suggested dilutions stated in the instructions included in the Kit, until you obtained some experience of your own.

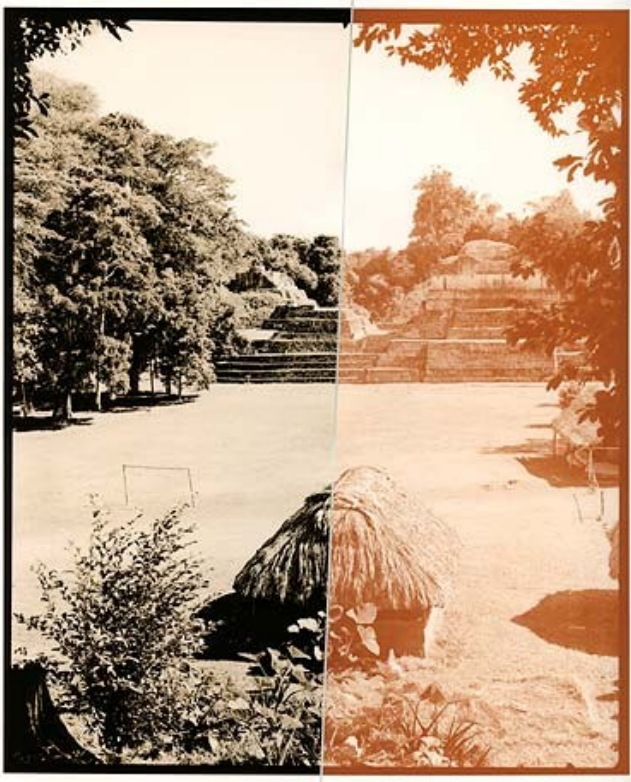
The lith developer has to be made up stronger (approximately 1+7 to 1+15) than with pure lith printing. The deep shadow areas shall not start emerging at the end of the developing process, but already after 2 to 5 minutes. Mid-tones and highlights shall only be slightly visible and will be developed further in the second developer bath.

The second developer is to be composed out of three different ingredients. The pH-value of my Glycine Developer Siena is so low, that it has only little capacity to develop, when diluted with water. The carbonate solution is used as an activator. How much of it you require depends on the desired effect. As a general rule, the ratio between developer and activator should be between 2:1 and 1:1. Without adding ammonium chloride, no outstanding colourfulness is to be expected, even with weak developer dilutions. Carbonate and ammonium chloride in equal parts give reddish tonalities. An excessive surplus of carbonate generates dichroitic fog, which has to be suppressed by adding anti-fog solution (Lith D). A surplus of ammonium chloride results in yellowish hues. It is advisable to begin with only a small amount of ammonium chloride (about 50% of the amount of developer concentrate used in the working solution) and to add carbonate only in small quantities, until the desired image tone is reached.

Both developers Lith and Siena have to be adjusted in their effect to the quantity of light used during exposure. Depending on the degree of dilution, an overexposure of one-half to five stops is necessary. Since filtration absorbs a huge amount of light, without much benefit to the lith printing technique, it is advisable to use white (unfiltered) light during exposure, to keep exposure times to a minimum. In some cases it can be sufficient to take the exposure time of a filtered conventional print and use it without the filtration for the lithprint.

First of all, the exposure time for the first developer is to be determined. The quantity of light that generates the dark shadows while in the lith developer after 2 to 5 minutes is to be used for the second developer as well. The dilution of the second developer is to be chosen, as to fully show the light and mid tones after a developing time of 1 to 3 minutes. Only when the test-strips in both developers (with the same exposure time!) yield to the desired densities, can the two bath development lead to the wished for result at first go. If the print looks too dark, either slightly shorten the exposure time or make the working solution of the second developer be less strong.

Examples from a workshop, photo Edgar Zieser

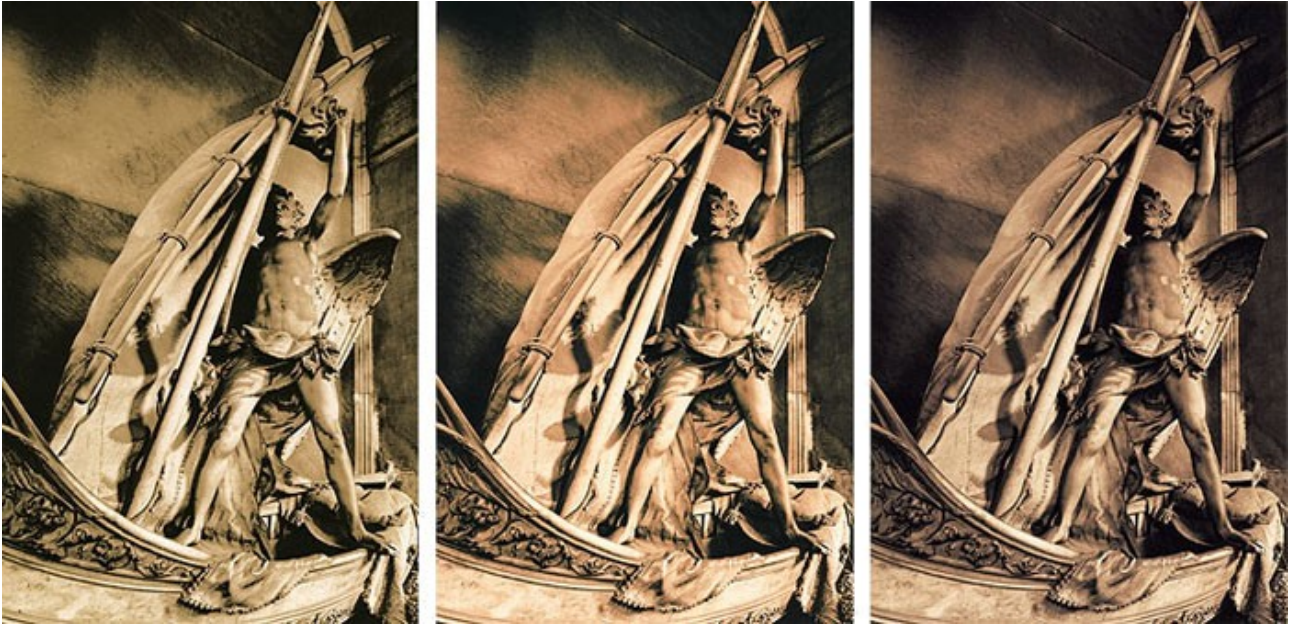


Test development Lith and Siena solo



Two tray: exposure and developing as on the left

For a start into this developing technique I recommend the use of either Fomatone or Kentmere Kentona papers. Fomatone can be developed to colourful hues between yellow and purple. Irrespective of the choice of dilution for the second developer, the shadow areas generated in the Lith developer will appear greenish.



First developer in all three examples: Easy Lith 1+15 for around 4 minutes of developing time.

Left picture, second developer mixture: Siena + ammonium chloride + potassium carbonate 50:25:25:1000 for yellowish tones.

Picture in the middle, second developer mixture: 50:40:40:1000 + 10ml Lith D.
More overexposure results in reddish mid tones and highlights.

Right picture, selenium toning shifts the colours of the shadows towards magenta. The print will turn a lot darker and ought not to show maximum black prior to toning.

If the highlights appear obscure due to excessive overexposure or a rise in density of base&fog occurred because of a high dosage of ammonium chloride, bleaching the highlights (bleach dilution of 1+100 to 1+200 for 15-30 seconds) prior to toning can be a remedy.

The frequently asked question of how negatives should look like for lith- and polychrome techniques, is easy to answer. Of course you cannot go wrong with the "perfect negative", but it is not a must. Most challenging negatives, even those unprintable ones can be put on paper with this technique. The following examples should make that clear.

Using two bath development with lith allows manipulation of the contrast of different parts of the negative separately. For example, if a negative covers a contrast multitude - for reasons of underexposure and overdevelopment - often filtration and burning and dodging are not sufficient.

In the example below the sky is very dense. The amount of light needed to show all the details in the sky would completely blacken the shadows.



Negative by courtesy of Jon Boner.



Above right, printed conventionally; below, two bath technique with lith. All possibilities of contrast control through split filtration were used. Yellow filtration was used when dodging the lower part; the sky was burned in with mid gradation. To split the shadows even further, the first developer was lith (1+10) and the second was SE1 Sepia developer (1+15). Exposure time was chosen for the Sepia developer to render the highlight details. Developing time in both developers was 2½ minutes, respectively. Since the print was -untypical for lith- not overexposed, the slow lith developer was only able to start developing the shadows, without giving them full density. The

second developer will darken those densities instantly, without destroying the details. The mid tones and highlights take the usual time to develop.

For polychrome development in lith and Siena exposure times have to be significantly longer. All interventions stated above were applied in here as well. Only the yellow filtration was dropped for the stronger unfiltered white light.

Magenta filtration was used for the shadows and unfiltered light for the light areas. Burning in the sky had to be done mostly with magenta filtration to keep the contrast in the light areas.

This is what a polychrome print typically looks like before drying. It must be pointed out, that the print will appear darker and more colourful when dried.

The dried print before toning.

If you don't like the green to blue-green shadow tints, Selenium toning is the way to go. If the toner is diluted to 1+25, only the darkest shadows will be further deepened during the first half minute. After that the shadows slowly turn to a warm red and later magenta. With lith and polychrome printing silver density in the light tones is not very high, so that the toner has little impact there. On top of that selenium toner always reaches the lighter areas only after a longer time of toning.



nsatzvarianten

MT1 Selenium 1+25 3 mins

MT1 Selenium 1+25 6 mins

Polychrome development Part 2: alternative methods

Printing conventionally in one bath, it is impossible to render the correct tone value of negatives with too little contrast range. Only the papers Ilford MGW and Agfa MCC still give satisfactory results with a contrast less than 0.70 logD. For even more translucent negatives, not even such top papers (with real gradation 5) are a help. With 0.50 to 0.60 logD the tone values are too close to each other and have to be separated by using high contrast developers. Here two bath development with lith as first developer is a good choice. An alternative would be two bath development with separated developer and alkali solutions, or even the two options combined.



Photo: A.S.C.

Pola negatives (type 55) are very delicate when the positive appears somewhat correctly exposed. Only when the positive is too light because of overexposure, the density of the negative is correct. Rushed Professional photographers don't give much on this. Such a negative is often only a by-product of exposure control, which they keep just in case without handling it with much care. However, polas in general and those test shots in particular have their own special appeal. It is not uncommon that the follow up shots on roll film, despite or because of their technical perfection, cannot live up to the intensity - and the "authentic" impression of what the idea of the picture was - of such a pola negative with all its flaws.



Left: As was to be expected, the print with gradation 5 is not satisfying. There are no deep blacks in the shadows and the light tones are gray.

Right: Two bath development in lith and VGT using gradation 4. Despite softer filtration, the shadows are black and differentiated.

1

2

3

Lith 1+10 for 3:30 minutes, Stop bath 30 seconds, Rinsed for 30 seconds

VGT 50 seconds, A 60ml, B 5ml, 500ml water

VGT alkali 2 minutes, C 60ml, 600ml water



Polychrome print, Paper Fomatone 132

1) Lith 1+8 3 minutes

2) Siena 1+4 without alkali 1 minute

3) Alkali solution (carbonate and ammonium chloride) 2 minutes

Toned print, MT4 Siena Polysulphide Toner
diluted 1+25 40 seconds with the usual aftertoning in the wash

Variations in preparing the working solution

An alternative in order to preserve the expensive second developer: if you use Glycine Developer without alkali, you can use it for many months. In order to prevent contamination with alkali coming from the lith developer, use a stop bath to neutralize and rinse in running water before taking the print to the second developer. Small amounts of acid are no harm to the second developer, because the pH value of the working solution (diluted with water) is between 7.8 and 8.0. A further decline is uncritical.

The concentrate is diluted between 1+4 and 1+8 with water. The emulsion only absorbs the developing substance. No significant development reaction should be observable.

Development only takes place in the following activator bath. When developing in separate baths, the activator can only work as long as developer substance is present. Using the suggested dilutions, this process is completed after about 1½ to 3 minutes.

The amount of developer substance absorbed cannot be increased arbitrarily by extending the duration of dwell. Once the water (from rinsing) is washed out of the emulsion, meaning no remaining incline in saturation, maximum absorption is reached. If more developing substance is to be absorbed by the paper, the concentrate is to be used less diluted.

The less developer solution you carry into the activator bath, the longer the activator bath will be useable. If you allow every print to drain thoroughly (around 20 seconds for a 24x30 sheet of paper) you can use it for an entire session.

Polychrome without Siena developer

In the absence of sulphite the developing substance of lith developer (hydroquinone) has the capacity to develop colourfully. In strong lith developer solutions the paper emulsion absorbs a sufficient amount of this substance. This means you can do without the second developer (Glycine), if only the higher colour intensity is to be achieved. A strong evocation of mid and light tones, comparable to what is typical for Glycine, is not taking place. If an increase in density of the highlights is wanted, you have to overexpose the print more than when using two bath treatment with Siena. However, mid tones and lith black will then emerge simultaneously, which makes it difficult to find the snatch point reproducibly.



First developer Lith 1+10
with 20ml Lith D per litre
developed for 3 minutes
"Second developer" Activator 1+1+10 for 3 minutes
Photo: A.S.C.

Here I opted to use the carbonate solution of my Polychrome-Kit as alkali. It is also possible to use Lith B as activator, although the image tones will be less red. The colours of the shadows will also be less intense, because Lith B takes away some of the chromophoric oxidation products.

Polychrome development Part 3: Suitable papers for polychrome development

Suitable papers for polychrome development and their varying reactions to toning in Selenium and Polysulfide.

In the following examples all papers were developed in identical developer dilutions. The only differences were exposure times and the developing times needed for the first developer.

This infrared negative is an example for a high contrast range. The developer was Tanol Speed. Silver density alone is around 1.46 logD! Silver density + stain result in too high a contrast range for blue sensitive graded papers processed conventionally. A print on grade 1 would look as if printed on grade 4 or 5. Such "unprintable" negatives turn unproblematic using Polychrome technique controlling the result via the quantity of light and the duration of dwell in each of the two differently working developers.



Fomatone 132



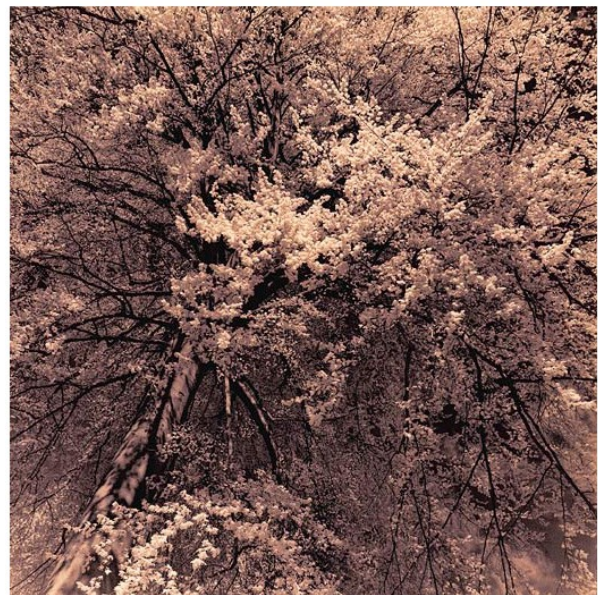
Fomatone 132 MT1 Selenium 1+25 4 mins



Fomatone 132 MT4 Siena Polysulfide toner
1+25 40 secs



Kentmere VC Warmton untoned



Old cadmium containing Kentona, untoned



Kentmere Kentona cadmium free



Kentmere Kentona MT1 Selenium 1+25
2 minutes



Kentmere Kentona MT4 Siena Polysulfide
toner 1+25 1 minute



Forte PW14 - Select VC - Bergger Prestige - Adox Polywarmton MT1 Selenium 1+25 2:30 minutes



Fomabrom Variant III

A stronger developer solution should have been used for this paper. The 6 minutes it took to darken the deep shadows was already too long in comparison to the other papers. In contrast to Fomatone, which is not a sensitive paper at all, overexposure time had to be tripled. As a result the highlights appear obscure. To clear the white areas the highlights were reduced (by mild bleaching and then fixing).



Fomabrom Variant III MT1 Selen 1+25
5 minutes

Of course, bleaching the highlights also removed the base fog, which is causal for an intensive hue. As is known, pure bromide silver emulsions react slower to selenium toning than emulsions containing a mixture. Using a dilution of 1+25 not much is happening even after five minutes.



Fomabrom Variant III MT1 Selen 1+6
4 minutes

Toning with Selenium

The diverse opportunities to use selenium toners have been discussed in detail on previous pages, so I will confine myself to the basics of its effects.

All selenium toners start their work in the shadows - on any paper! Warmtone papers with their fine silver grain tone quicker than bromide-silver paper.

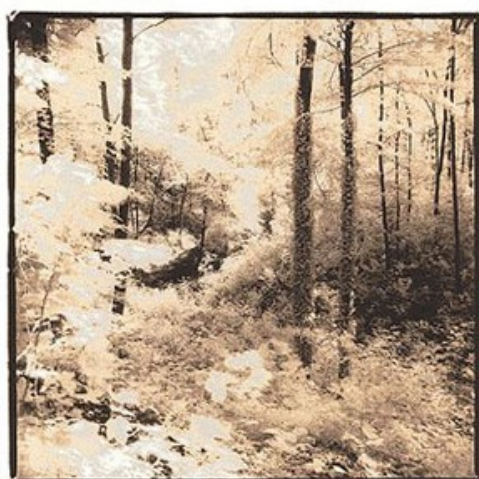
The increase in density of the shadows is stronger with warmtone papers than with neutral- or coldtone papers. This is clearly visible with polychrome prints, where the shadows show a green-black tone of low density instead of maximum black, because of the high content of bromide in lith developer.



Select VC Lith+Siena MT1 Selenium 1+10 4 mins
© Patrik Budenz



Lith+Catechol Fomabrom Variant with selenium toning



bleached to test the toner effect on the entire tonal range

Neutral- and coldtone papers have to be toned a lot longer than warmtone papers in the same toner dilution to establish a colour shift. This does not mean that the toner is less effective, it only means it is less visible. This is due to the structure of the silver grain. A transformation of metallic silver to silverselenide definitely takes place, even if it does not lead to red-brown hues. Selenium tone is not made for brown toning. Irrespective of the paper used, the image tone will turn cooler at first. The effect always starts in the shadows. Toning through to the highlights can take a while even with strong toner solutions. Warmtone papers allow you to judge the effect a lot easier, because the paper reacts a lot quicker to toning. In the beginning the shadows turn darker. After that, the silver colour changes towards reddish shades. At the latest when the colour shift reaches the midtones, the shadows change towards magenta and auburn and loose their density. Coldtone papers seem to react in a completely different manner. Shadow density increases here as well, but when toning for a longer time the image tone shifts towards a cool magenta and mostly does not loose shadow density until toning is stopped. An effect is there, even if - to an untrained eye - it is visible only in direct comparison to an untuned print. The silver stabilizing effect of selenium toning is overrated most of the time. At least with warmtone papers, for aesthetical reasons, the toning process is usually stopped too early to achieve a stabilizing effect. When the shadow colour shifts, the highlights have not been thoroughly toned! Using bromide silver emulsions the protective effect of selenium toning can reach the highlights before the shadows split into unpleasant hues.

How much impact selenium toning has, even with short toning times, is obvious when bleaching the untuned silver, retransforming it to silver salt. To demonstrate this I bleached a print that had become too dark. Toning times were the same for both prints. The aim of toning was to deepen the shadows and to slightly cool down the overall image tone. Through bleaching, you loose everything but the pure image of selenium. With a dilution of 1+10, toning for 2 minutes, the toner reached the higher mid tones on this paper (Fomabrom Variant).



Fomabrom f112 graded paper, Lith+Siena



MT1 Selenium 1+10 4 minutes

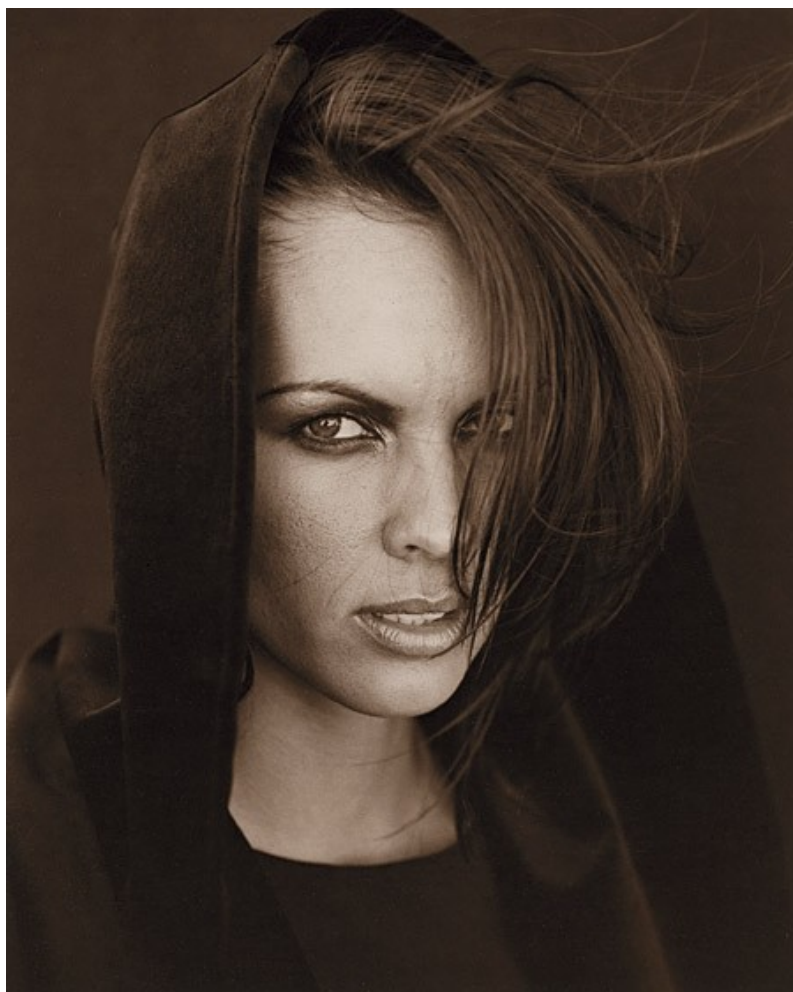
Polychromeprints on warmtone papers tone a lot quicker than those on neutral bromide-silver emulsions. To allow controlled toning of the shadows, the toner dilution should be 1+20 or diluted even further. If you want to reach all tones, use 1+10.



Kentmere Kentona (cadmium free) SE15 Polychrome (Lith+Siena)
MT1 Selenium 1+10 5 mins

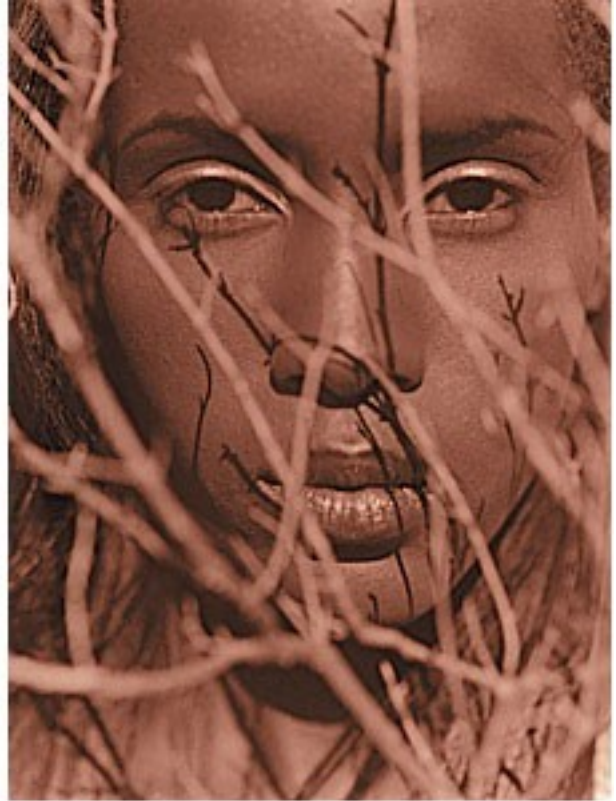


Select VC SE15 Polychrome (Lith+Siena)
MT1 Selenium 1+20 2:30 mins



Kentmere Kentona (old cadmium containing emulsion) SE15 Polychrome (Lith+Siena)
MT1 Selenium 1+30 2 mins

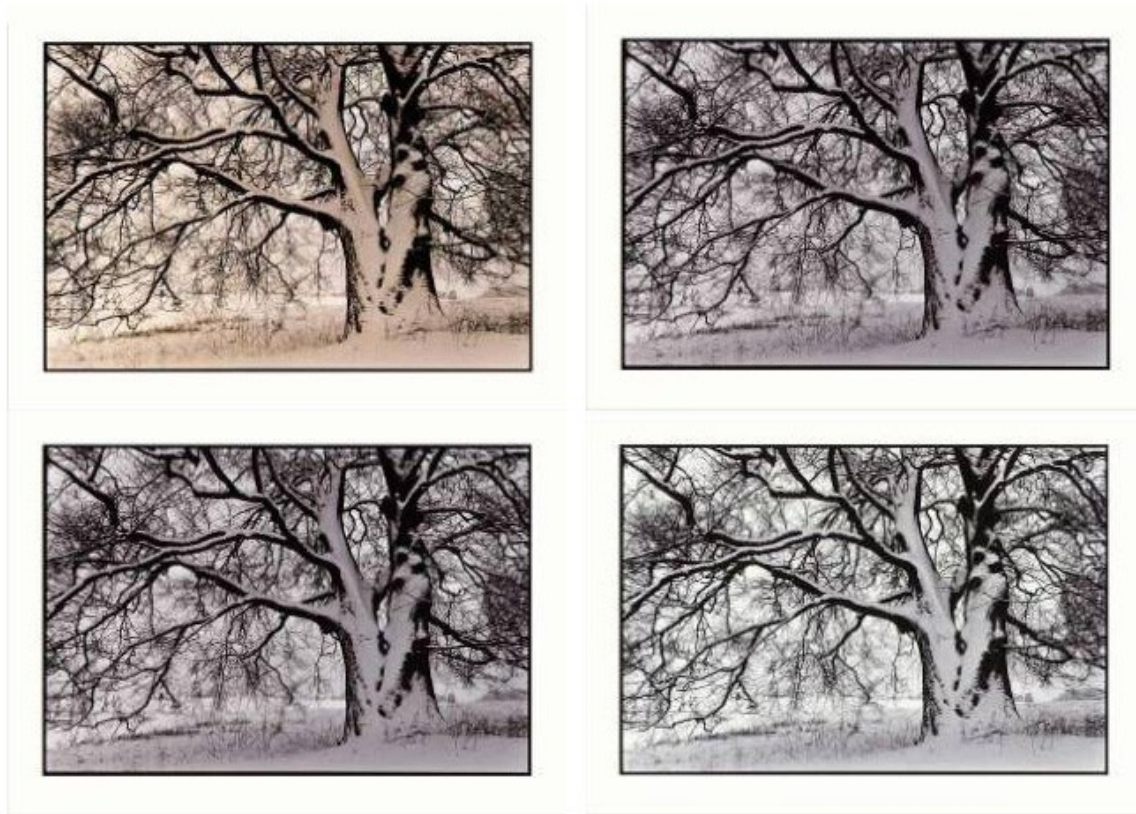
Toning in Selenium and Gold



Paper: Select VC/ Forte PW14

Top left: without toning, soft without deep blacks in the shadows
Top right: after toning in MT1 Selenium Toner 1+10 for 1:30 minutes
Below left: after toning in Selenium and MT10 Gold Toner for 3:30 minutes, wet print
Below right: after drying

Caution! Selenium Toner contains thiosulphate. The print has to be thoroughly rinsed before toning in Gold.



If a blue image tint is to be achieved by toning in gold, the untuned print has to be warm and low in contrast. Gold toner brings immense density to the print and uses a lot of toner substance. For that reason inexpensive selenium toner is used where there is a lot to do - in the shadows. When toning warmtone paper in strong working solutions for short toning times, all densities increase. The shadows, however, will be affected over-proportionally. After rinsing the print, gold toner is used to get the desired luminosity. While drying, the hue shifts to a cooler blue with higher density. You have to take this increase in density into account already when printing.

If the print looks too dark after toning and a more filmy appearance is desired (like in the winter landscape to the left), you can reduce the silver that was still not reached by the toner. For that purpose we do not take the irreversible "Farmers reducer", but bleach and fix in separate baths. If bleaching was too strong, you can redevelop. To achieve a directed effect with bleaching, you have to be familiar with what the toner does. Selenium toner works its way from the shadows to the highlights. Generally speaking, gold toner affects all densities simultaneously, but the highlights are fully toned prior to the more silver containing shadows. You can make use of these two different qualities to reduce mid tones - if they happen to be too abundant - or to achieve a clear blue without any cast of magenta, with strong gold toner solutions.

To control bleaching, the bleach bath should not be very strong. Dilutions between 1+40 and 1+100 allow enough time to observe the process.

After bleaching combined with selenium and gold toning, especially the mid tones appear lighter. The colour has not changed a lot.

If you put the print into fixer - after a short rinse - it lightens even more and an immediate shift to blue occurs. Here as well, while drying, the densities increase again slightly, although not to the same extend as with gold toner without bleach.

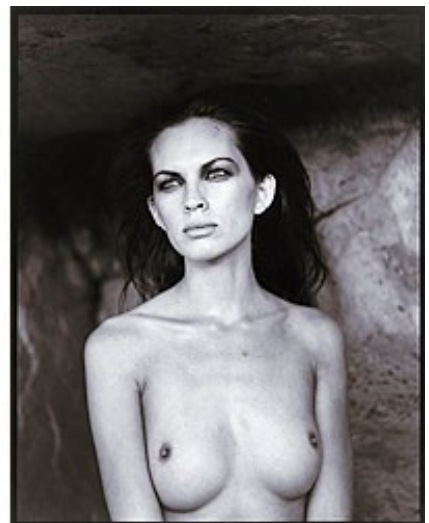
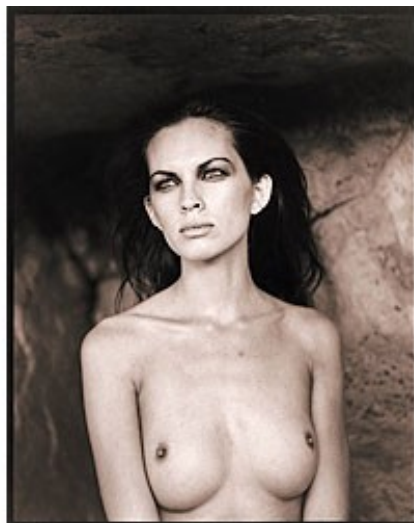


Selenium + Gold
© Gerhard Fuhs

If gold toner is used for a short time only - after pre-toning in Selenium - the highlights react with a slightly reddish cast. In order to prevent toning to reach purple and blue, the print has to be taken out already after about 30 seconds and rinsed in plenty of water. Take into account that Gold toner keeps toning in the rinse water for a while. If the toner reacts too quickly, it can be diluted further. In a 1+10 dilution of 200ml, one 24x30 print can be toned.

Pure gold toning

Comparing different gold toner formulations. Here my Gold Toners MT6, MT9 and MT10.



Polychrome print on Select VC
From left to right: no toner - MT10 for 1 minute - MT9 for 1 minute
© A.S.C

Short toning times allow us to observe the differences between these gold toners. Longer toning times result in an intensive blue tone in mid tones and highlights (after two bath development in Lith + Siena).

MT9 tones from highlights to shadows with a clear edge.
MT10 tones all densities simultaneously, starting with a cool reddish cast.

In the beginning MT10 is slower than MT9, but reaches the shadows earlier. If you want a homogenous image tone, MT10 is the better choice.



With increasing time of toning, the hue turns cooler and reaches the shadows as well. Right picture: 9 minutes.
If you want the highlights to keep a touch of warmth, use sulphur toner prior to gold toner.

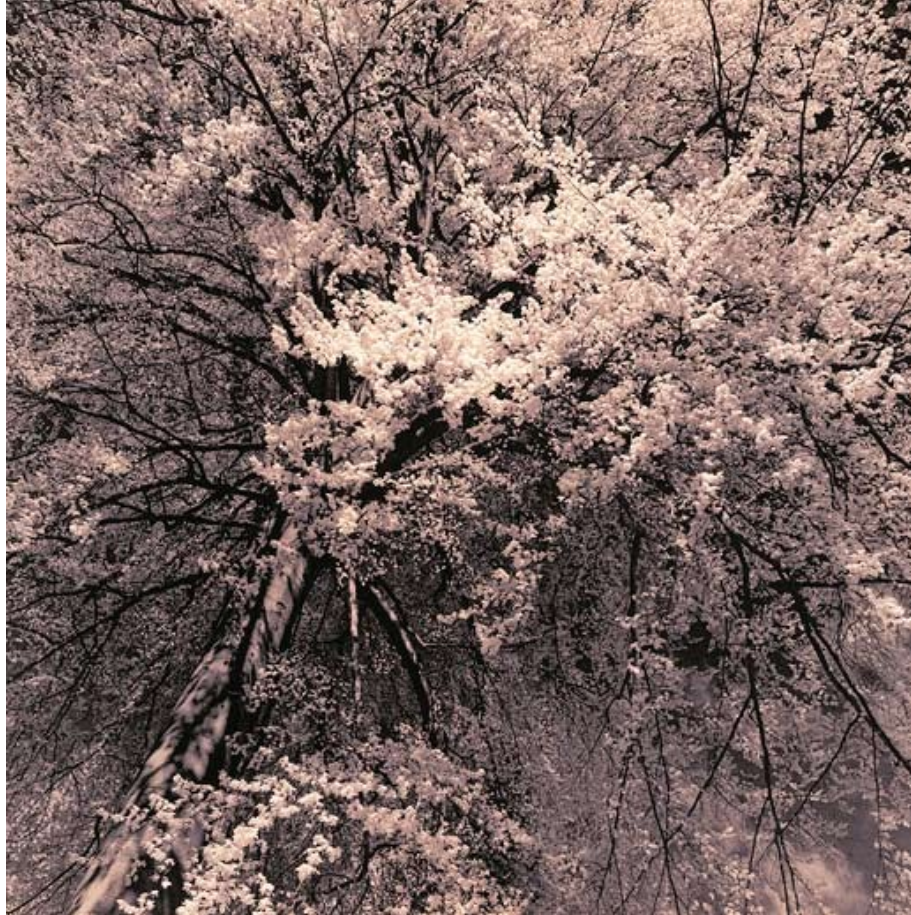
Polychrome prints have a higher density in the highlights than pure lith prints. So there should be enough silver for indirect toning.

In diluted bleach (potassium ferricyanide/ potassium bromide) only the highlights are delicately bleached and then toned in thiourea (MT3 Vario) adjusted to a lighter or middle range tone. In contrast to sodium toner and polysulphide toner, thiourea only tones the bleached areas.

After rinsing, tone with gold (MT9 or MT10) to the desired intensity. If you use a strong sulphur toner solution as pre-toner, with increasing duration in gold toner, a bright reddish tone emerges. When pre-toning was less intense and gold toning was shorter, the hue stays more subtle (see picture above left).

MT6 Nelson Gold Toner

MT6 has a special position. In contrast to the other two gold toners, cool shadows with bright yellow highlights appear already with short toning times.



paper Fomatone, MT6 Nelson Gold Toner 38°C 3 mins

With longer toning times the print remains multicoloured, but starting from the shadows onwards the result appears cooler.

Toning with Gold and Iron



Polychrome print, Lith+Siena on Fomatone untoned



Gold toning MT9 1:30 mins



Iron-blue Toner MT7 for 30 seconds after gold toning



Bleached after gold toning and redeveloped in SE6 Blue.

Polychrome prints on warmtone paper cannot always be toned in iron-blue toner right away, without losing highlight density. This is because, in these zones, the picture is predominantly made up of oxidation products attached to the finest chloride-silver grains. Bleaching would result in a total loss of pigment density. Only when the highlights are as dense as to show no pure paper white (like in picture 1) - meaning the print appears soft and obscure -, toning in iron-blue is an option, which results in brighter highlights. The prussian-blue pigment of iron-blue toner is unstable in alkali, so that excessive rinsing in tap water, which is also slightly alkaline, can result in fading colours and loss of the brightest highlights. If gold toner is used to protect the silver of the highlights, the original densities are preserved (picture 2).

By means of toning in MT9 Gold Toner, the highlights are fully toned and mid tones receive a colour shift, without being fully protected. The transition is smooth from highlights to shadows, so that the deep blacks with high silver density remain virtually unprotected. Except for the highlights, there is enough silver present to be converted to prussian-blue pigment by iron-blue toner. The blue-green hue, which emerges after toning, can be shifted towards magenta-blue by a weak ammonia solution (picture 3). This also removes most of the yellow cast that bleaching left in the gelatine. If only this cast is to be removed, common salt solution is sufficient. Final rinse should be no longer than 5 minutes!

If a less intensive hue is desired, you can bleach (potassium ferricyanide/ potassium bromide) after toning in gold and redevelop in coldtone developer. SE6 with Finisher Blue was used in picture 4.

Toning in sodium sulphide, thiourea and carbon

Indirect toning in sulphur toner is no gain to pure lith prints on warmtone paper. Bleached areas will come back in more or less the same tint, but with lower density.

With two bath technique silver density in highlights and mid tones is higher. The silver of the original colour can be transformed into silversulphide.



MT1 Selenium toner and MT3 Vario sulphide toner

Lith+Catechol on Select VC

The structure of the background was suppressed by a longer development time in lith. Selenium toning for a short time made the shadows inaccessible to bleaching. The print stayed in a bleach solution of 1+30 for about 1 minute until the blossoms had almost vanished. Then MT3 Vario Sulphur Toner in "dark- yellow" configuration was used (in a ratio of toner:activator:water 5:6:90).



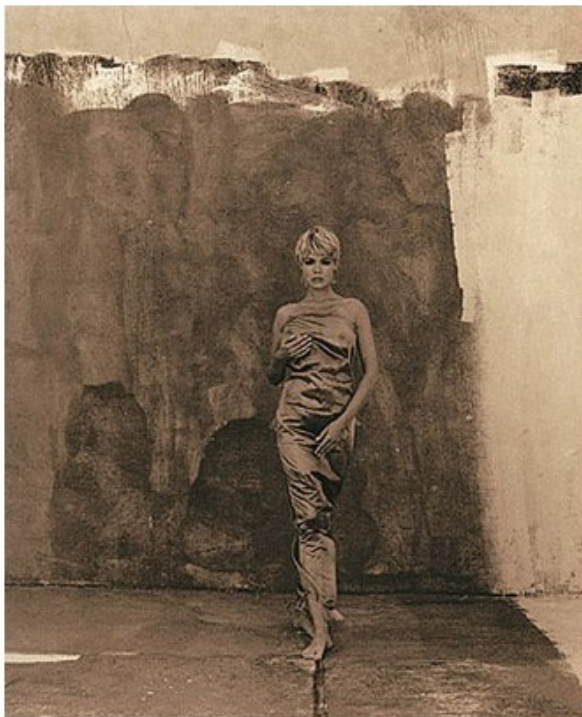
MT20 Carbon and bleach

Lith+Catechol on Select VC

The highlights were bleached in a dilution of 1+40 for 1 minute.

Carbon Toner was used in a dilution of 1+20 for 3 minutes. The bleached highlights reappear after only a few seconds. Longer toning times change nothing about the highlight colour. Since carbon toner also tones the areas that have not been reached by bleaching, you can control the background tint. At first the shadows turn to a darker brown and shift towards more reddish hues after longer toning times.

Straight carbon toning reduces colourfulness while shadows and mid tones turn darker.



Polychrome print on Fomatone



Carbon toner 1+25 2 min



MT3 Vario + MT9 Gold Toner

Pinhole photograph

Polychrome print (Lith+Siena) on Select VC

Highlights bleached in a 1+40 dilution for 20 seconds
Toned in the "brightest" configuration of Vario Toner (5:3:90) for 30 seconds.

If followed by gold, such soft sulphur toning does not lead to the usual reddish hues. The highlights remain almost unchanged in their yellowish tint. The shadows turn blue-black and the transition towards the upper mid tones turns greenish. Although the shadows had by far not been fully toned, they had become too strong. To brighten up the picture quick bleaching of the remaining silver with subsequent fixing resulted in a reddish cast within the deep shadows.



Lith + Catechol



MT2 Carbon + MT10 Gold

If a print on warmtone paper was developed to warm tones, using a combination of carbon- and gold toner leads to a cool tone with an immense increase in density. In contrast to polychrome development with Lith + Siena, using a developer combination Lith + Sepia or Lith + Catechol generates a continuous hue across all tone values. To achieve this, use carbon toner only for a short time and - after rinsing - gold toner until the desired tint is reached.

If you understand how both toners work, a lot of different colour tones can be achieved and reproduced. In a dilution of 1+10, carbon toner takes effect from shadows towards highlights. It takes 15 to 20 seconds to darken the shadows. After that all densities shift towards a cooler red tone. Using dilutions of 1+60 and higher the shift is more towards yellow and is starting in the highlights. It takes longer to intensify the shadows. In dilutions of around 1+30 this toner reaches all densities at the same time. It still tones rather quickly and if you need some remaining silver for gold toning, toning times should not exceed 1½ to 2 minutes (for warmtone paper).

If you start with gold toner instead, only the mid tones and highlights remain for the carbon toner, with the consequence of a more or less pronounced split tone of bluish highlights and deep black shadows for very short toning times and reddish shadows for longer toning times.

Toning with MT4 Siena (polysulphide toner)



© Markus Rottländer

Select VC SE15 Polychrome (Lith+Siena) MT4 Polysulphide Toner 1+200 for 1 minute. Further toning during the wash.



TToning in MT4 Polysulphide Toner with additional toning in final wash

If the toner is highly diluted, the print will be multicoloured after rinsing and drying. The warmer the development of the print prior to toning and the higher the dilution of the toner, the more colour you get. The final result is only to be judged when the print is dry.

One of the best papers for this toning method is Fomatone.

Step 1:

Two bath Lith+Catechol - dilution: Lith 1+10, Catechol 1+100 - developed for 2:30 minutes respectively.



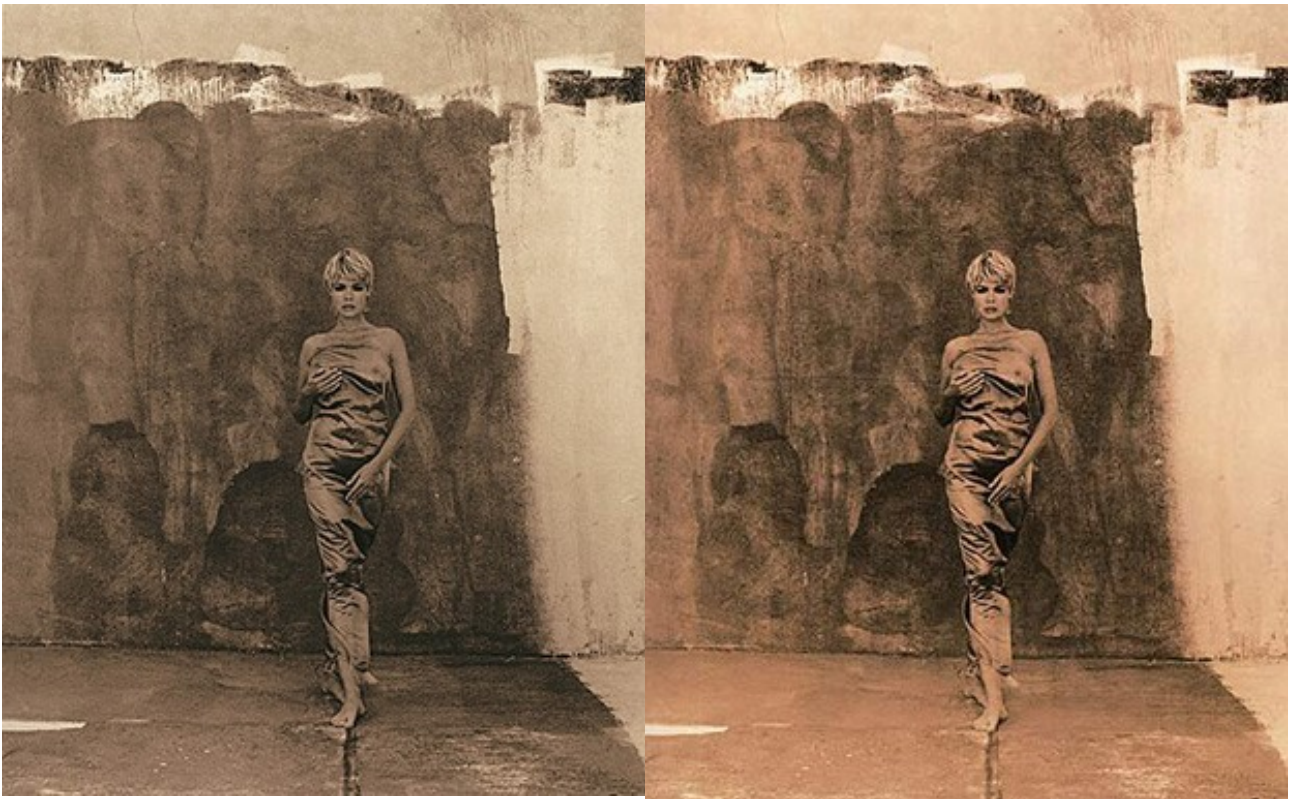
Step 2:

MT4 Siena Polysulphide Toner - dilution 1+250 - toned for 20 seconds. The shadows and mid tones turn darker, but the print is still monochrome. If you want this to stay, normal rinsing is not sufficient to stop the toning process. The toner in the emulsion has to be displaced by a 10 to 20% sulphite solution.



Step 3:

After toning, the print is placed in a water bath for 1 to 4 minutes. Even if it is not immediately visible, the toner is still active. Rinse thoroughly afterwards. The toner will be active in the water bath and the early rinse water. After 10 to 20 minutes a completely different image tone can be the result. Highlights appear yellow, transition to the shadows look greenish, or like here blue. Generally speaking, when drying this effect intensifies or it even only generates through drying.



If you increase exposure and adjust the developer dilution or add some alkali to the second developer, the colour of polychrome prints will become more red. When toning in polysulphide, the redder the original print, the bluer will the toned print be (after drying).

Longer development times in the first developer have an even stronger effect, if the developer was retarded by either Lith D or potassium bromide due to longer exposure times.

The dilution of the toner also has an effect on the result. For polychrome prints, MT4 can be diluted from 1+20 to 1+1000. Irrespective of the dilution, the print will be multicoloured. You see this at the latest when it is dry. With higher dilutions and toning times between 1 and 2 minutes, you have more control over the toning process than with dilutions of up to 1+50. Toning will progress in the rinse water in any case. Given that this toner still works in a dilution of up to 1+1000, it is obvious, that the first rinse water is merely only diluting the toner that is still present in the paper. It is not washed out immediately. If you want the print to keep the colour it has right after toning, you have to replace the sulphide in the emulsion with sulphite. To achieve this, rinse the print for only 2 to 4 minutes and then place it into a 10 to 15% solution of sodium sulphite for 2 to 3 minutes. If sodium sulphite is not available, use a sulphite-based clearing agent diluted to 1+1.



For demonstration a print was toned for 50 seconds in MT4 Polysulphide Toner 1+25, rinsed for 3 minutes, stopped in 10% sulphite for 2 minutes, and rinsed again.

Even after drying, the print stayed unchanged compared to the one that came straight out of the sulphite bath. So the image tone has to look like this (to the left), in order to become a split coloured print by leaving it in the first rinse water for additional toning.

The alteration in colour comes along with an increase in density that goes up as far as the highlights. Now the print does not show contrast. The shadows are too dense and too wide. If additional toning in the rinse water had been permitted, the contrast would have increased and mid tones and highlights would have become brighter with a yellow-green cast.





This polychrome print on Select VC was toned in a dilution of 1+1000(!) for only 20 seconds and stayed in water for around 5 minutes before it was rinsed in running water.

To achieve this kind of colour split, you need a print with greenish shadows and magenta-red highlights.

If the shadows are to appear lighter, development in the lith developer must be stopped prior to reaching deeper blacks. The print has to be soft and delicate. Contrast is given by the toner.

Below left: Polychrome print on Kentmere Kentona
Below right: toned in MT4 Polysulphide Toner 1+25 for 30 seconds

© A.S.C.



Polychrome print on Kentona

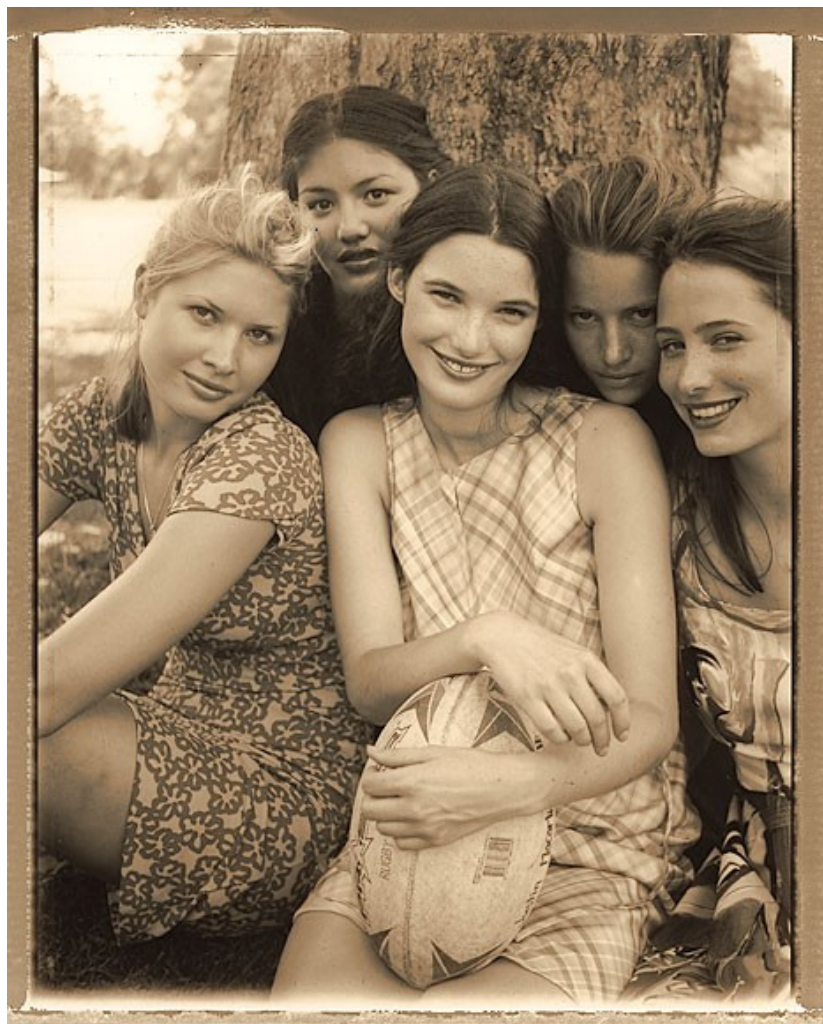


MT4 1+25 30 seconds



Polychrome print on Fomatone

MT4 1+25 30 seconds



Select VC Two tray 1st developer a mix of Lith and VGT, 2nd developer Separol HE 1+15



Tonung MT4 Siena 1+20 15sec - Nachtonung zugelassen

Dieses Beispiel zeigt, wie die Wahl der Entwickler das Tonungsergebnis beeinflusst. Der durch Mischung mit VGT-A "entschärfte" Lithentwickler bewirkt noch eine Tontrennung von Schatten- und Mitteltönen, doch die Farbe nach der Tonung ist einheitlicher als bei Polychromeprints mit Lith und Siena. Auch hier fand eine Nachtonung im Wasser statt, der ursprünglich dunkelbraune Ton wurde gelblicher. Der typische Übergang zu den Schatten mit grünlichem Anflug ist dennoch schwach vorhanden und könnte durch ein Übertönen mit Selen beseitigt werden.

Toning with cobalt and iron



Polychrome print on Select VC



MT12 Cobalt and Iron



Polychrome print on Fomatone 132
MT12 Cobalt overtone with Iron
© A.S.C.



Two bath: Lith + Amidol on Fomatone MG 131
Toned in Gold + MT12 Cobalt + iron

Two bath development with Lith + conventional developer

If a more subtle colouring is desired than with polychrome technique or if lith is only used as first bath to increase flat shadows in the negative, any positive developer can be used as second developer. Here it makes sense to use a slow working formulation.



SE20C Catechol on neutral tone paper

In Germany, vario-contrast bromide-silver paper (Varykon) of Fotokemika was distributed by MACO (Multibrom) and Fotoimpex (ADOX Fine Print Classic) in recent years. This paper liths with a sharp edge, deep blacks and an unspectacular colour. Here, in two bath development with an overexposure of 1 to 2 stops, lith developer is used only to develop the shadows. All other tone values are developed in diluted conventional developer. A good choice for this purpose is Catechol, which is strong and works slowly. The dilution depends on the amount of light given and can vary between 1+20 and 1+80. If you give a lot of overexposure to the print, you also have to dilute the lith developer more. Alternatively you can use Lith D or bromide to slow it down.



SE2 Warm on neutral tone paper

This developer reacts a lot more quickly. As above the paper was ADOX Fine Print Classic. Giving it about as much light as in the combination above, you have to dilute this developer a lot more in order to allow a slow development to delicate mid tones and highlights. The reason for this extreme difference lies in the formulation of the developer, which uses a higher dosage of an accelerator for development. Using this developer combination, the image tone will be less colourful. The print was toned in MT2 Carbon Toner 1+20 for 2 minutes.

© A.S.C.



SE20C Catechol on warmtone paper

Warmtone emulsions like Select/Forte/Bergger react with a lot of colour to the combination of Lith and Catechol, when overexposed a lot. If the second developer is highly diluted, densities in the mid tones will only increase slightly. Lith 1+8 and Catechol 1+50

© Heike Stark



SE30 Meritol on warmtone paper

Using Lith+Meritol on Select VC results in yellowish highlights, slightly red mid tones and green shadows. In selenium toner 1+20 these shadows increase in density within 30 seconds and show a cool magenta tone with maximum black after 60 seconds. If toning is envisioned, the print must not contain deep blacks, as they would grow too dense and loose detail in the toner.

© A.S.C.



SE1 Sepia on Agfa MCC

The emulsion of Agfa MCC went through a couple of changes over the years. Sometimes the result was a deprivation of its "lith-ability". The last charge can be used for this technique though. Start the development in lith developer with increased content of bromide (Lith D) until the shadows are clearly visible without showing full density. Then develop as usual in diluted second developer (1+50 to 1+200). You don't necessarily have to reach maximum black with the second developer, if you want to tone in selenium or carbon afterwards. With carbon toner a dilution of 1+40 is sufficient to increase the density of the shadows after only a short time. The initially green tint of the shadows turns redder with increasing time of toning and ends up in a cool magenta after a couple of minutes. In the photo above toning was stopped after 2½ minutes, to keep the greenish cast in the transitions to the yellow highlights.



SE6 Blue on Select VC

SE6 Blue is my strongest concentrate and has to be diluted up to 1+300 after lith. Alternatively, you can add Finisher Blue to retard a dilution of 1+30 to 1+50. Despite overexposure for the first developer, this can result in a cooler image tone.

© Peter Ginter



VGT

The VGT kit with its components allows us to prepare developer solutions for any given purpose. If you desire deep shadows and a "conventional" progression of tone values with a red-brown cast, the second developer has to be more active than the lith developer. However, it also has to be working hard and slowly to allow it to translate the required amount of light to a straight lined ascent in tone values. For that reason the developer is mixed only with A (hard) and C (alkali) substances. The small amount of another developing substance, which would normally be added, is omitted.

© Stefan Steinbrecher



Tanol

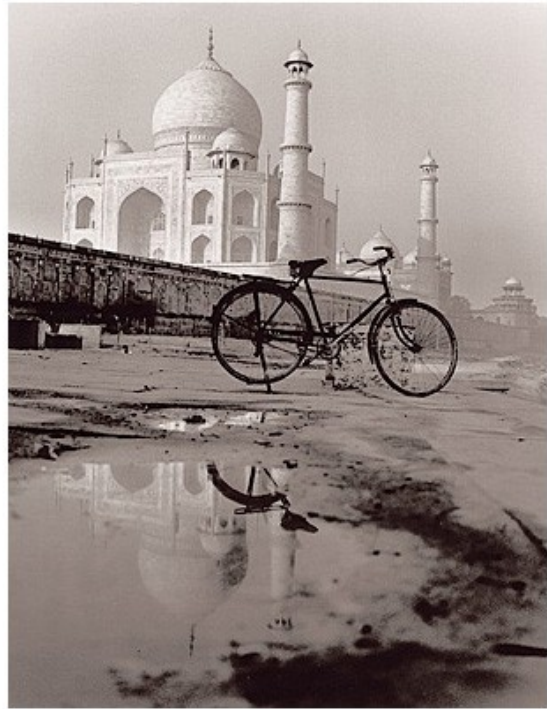
If no suitable warmtone developer is available, yellow-brown to red-brown image tones can be created with the negative developer Tanol. As is known, in the absence of sulphite pyrocatechol develops to a brown tone. The concentration of sulphite in Tanol is low, so that this combination works at least with warmtone papers. Using neutral tone emulsions like Agfa MCC, brownish hues can be provoked by adding ammonium salt. Due to excessive oxidation, you have to use fresh developer after only 2 or 3 prints. If you put the two components of the developer into separate dishes, you can use them a lot longer. The alkalinity of the print coming from the lith developer absolutely has to be neutralized with stop bath.

Two bath development with Amidol developer

It is hard to imagine more opposing partners in two bath development. There is no other developer that gives as delicately differentiated tone values across all densities as Amidol. Lith developer gives harsh and undifferentiated shadows like no other. If you print a negative with a high contrast range - due to underexposure and overdevelopment - or you want a graphical interpretation with differentiated highlights, it is an obvious choice to combine these two developers. The resulting image will be less colourful than with the combination of Lith and Siena. It is possible to tone these prints towards monochrome as well as polychrome results.



Lith+Amidol on Fomatone 131



Carbon Toner 1+20 for 1 minute

This negative resisted all attempts to be put on paper in conventional manner. Even when giving the highlights 20 times the exposure rate, they stayed limy in appearance. Pre-exposing the paper to bend the gradation goes beyond its limits where shadows already need gradation 5 without such manipulation.

With the according amount of exposure Amidol produces delineated highlights already with mid gradation. However, apart from the reflection, the complete area below would disappear in darkness. To cure this we have lith developer with its characteristic ability to narrow down the black areas.

Exposure time is chosen to suite the highlights. Use split exposure with filters 0 and 5 and dodge the area below while exposing with the yellow filter. Burn in the highlights with magenta filtration to give them more structure.

Develop in lith developer until only the deepest shadows begin to turn black. Stop development immediately and rinse before developing all the other areas in Amidol. Neutralizing the alkaline lith developer with stop bath is mandatory, because Amidol is and needs to stay acidic.



This negative still has a tolerable contrast range of about 1.4 logD, but there is little detail in the shadows. The highlights have a lot more density. To render the shadows with detail, lith developer was used until the traces of shadows and mid tones were clearly visible. After stop and rinse, the print was developed in Amidol for 90 seconds and then placed in a water bath to activate the Amidol that was still present in the emulsion. Amidol does not need alkali to develop. Already the change from the acidic developer to "neutral" water allows a visible increase of all densities.

The developer in the shadow areas is exhausted quite quickly, but in the highlights the development process goes on for another while. Amidol oxidises very fast. The higher the pH-value, the faster will the developer be exhausted. If you make the solution slightly acid, it is more stable.

If you prefer a more graphical picture, you can split the tones with these two developers. To achieve this, decrease exposure time and leave the print in the lith developer until the shadows begin to be as dense as is typical for lith printing. This should be the case after 4 to 6 minutes. The less mid tones you see by then, the more obvious will the split effect be.

Here, you have less control over the image tone, which depends more on the paper than on additives to the developer. As a general rule: The more light and the thinner the developer, the warmer the image tone will be.



Lith+Amidol onFomatone 131



Gold toner MT9 5 mins