

Brown Toning Part 1 Thiourea and Sulphur



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Wephota Baryt Brillant
bleached to the mid tones, toned in thiourea (Agfa 525)

Apart from ready made toner from shops, there are numerous free formulae. The amount of recipes suggests different results, but there is limited variation possible with them. Instead of relying upon those formulations, you should try to use different papers, if you are unhappy with the toning results on your standard paper. Deep brown or luminous red-brown hues, which once could be created with numerous bromide-silver papers, are a thing of the past. Most papers today, even if based on a traditional formulation, carry a mixed emulsion. Today (2007) there are still some bromide papers available, which can be toned with thiourea to deep brown hues:

- 1.Kentmere Bromide (graded)
- 2.Adox Nuance (graded)
- 3.Fomabrom (graded)
- 4.Fomabrom Variant III
- 5.Adox Fine Print VC
- 6.all Ilford papers

Most papers today carry a mixed emulsion with a high amount of silver chloride, which tones yellow.

Agfa MCC and Ilford Multigrade IV give rather pleasant tints.

Pre-toning in sulphur toner before bleaching results in deep brown hues with some papers. Rinse between all steps of treatment.



Agfa MCC sulphur toner, bleach, again sulphur toner

Modern warmtone emulsions can also be developed more or less colourful right away. The expenditure is a lot higher and more time consuming than even the most complicated process of toning. It is possible though, to redevelop the image in a suitable developer after bleaching. This allows you to observe the process in room light. As mentioned earlier, warmtone paper has a tendency towards yellow tints. This can be altered if you go to the trouble of playing around with both the toner adjustments and the characteristics of different papers.

Formulations of sodium-sulphur toners are not as diverse as to focus on them in here. Colour variation depends more on which bleach bath you use and to which degree bleaching is applied. Odourless toners in shops are thiourea toners. They all contain bleach and toner concentrates. Some of them allow fine tuning of the colours by adjusting the pH-value. With self-made formulations as well, the higher the pH-value, the darker the brown tone.

The bleach bath

For a start, it does not make any difference which formulation is used to transfer the image silver into a silver salt. For that purpose most bleach contains, potassium ferricyanide and potassium bromide. The ratio between these two substances has little effect on the result of toning, but the higher the content of bromide and the higher the pH-value, the faster will the bleach work. Of all recipes you can make concentrated stock solution that you can dilute as you require.

IMPORTANT! Before bleaching, the print has to be thoroughly rinsed. Remains of the thiosulphate of fixing would make the bleach be a reducer and redevelopment would be impossible. At least the highlights would vanish irretrievably. If you use a toner that is highly alkaline, with some papers it is advisable to harden the gelatine to preserve the brilliance of the paper surface.

Agfa 500 - working solution 1 litre 60g potassium ferricyanide, 4g potassium bromide
Agfa 501 - working solution 1 litre 50g potassium ferricyanide, 10g potassium bromide
Agfa 502 - working solution 1 litre 30g potassium ferricyanide, 50g potassium bromide, 10ml ammonia

Concentrate with the same or different weight proportion to 1 litre solution e.g. 100:100g, 75:25g, 30:90g dilution of working solution 1+5 to 1+20.

Agfa 502 has an unpleasant smell, due to the ammonia, but bleaches sweepingly within seconds. It takes a little bit longer for the residue colour to be washed off the paper, even if the bleach was used only for a short time. If the content of red prussiate of potash is low, rinsing has a quicker effect. Too short rinsing times can result in yellowing of the whites when toning, irrespective of which bleach is used.

Toner

As mentioned earlier, it is of no importance which one of the bleach baths is used. The resulting brown tone depends on the form of the silver that was removed, meaning on the composition of the emulsion, the ratio of Ag Cl : Ag Br. A high content of bromide silver promotes the formation of deep brown hues.

Sodium sulphide solutions of 0.5 to 2% strength are easily prepared and (after bleaching) tone quickly within 30 to 60 seconds. Using longer toning times, the toner also reaches the areas, which have not been bleached. Even if a shift in image tone is not always clearly visible, the stabilizing effect on the silver is obvious. (compare to bleach after toning)

Solutions of sodium sulphide and lever of sulphur smell unpleasantly like rotten eggs. This smell gets worse in the first rinse water. The sulphur hydrogen, which is released is a health hazard and can cause fogging on unexposed photo material. Danger detected - danger warded off?

In a darkroom with no ventilation and little supply of fresh air, you should not use sulphur solutions. If you don't want to miss out on the advantages of straight sulphur toners, you can rule out health risks by toning outdoors. Water the print twice before you return indoors. An alternative are odourless thiourea toners. It is not really necessary to add potassium bromide, since the alkalinity of the toner can be created with either caustic alkali or carbonate.

Alkalische Thioharnstoff-Kaliumbromidlösung 1 Liter

Agfa 520 - Thioharnstoff 5g, Kaliumbromid 40g, Natriumhydroxyd 3g

Agfa 525 - wie oben aber mit 15g Natriumhydroxyd (Ätznatrium)

1 litre alkaline solution of thiourea and potassium bromide:

Agfa 520 - 5g thiourea, 40g potassium bromide, 3g sodium hydroxide

Agfa 525 - as above, but with 15g sodium hydroxide

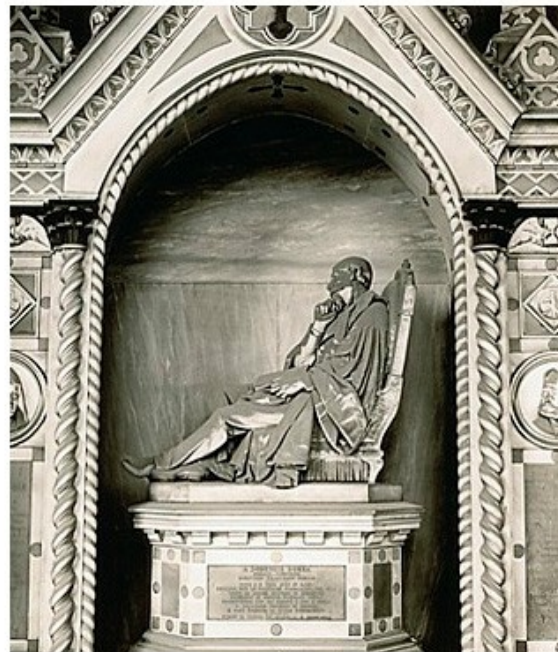
Both baths are long-living. If the effect is deteriorating, you can regenerate with NaOH. 520 produces a yellowish hue, which is more delicate. 525 is stronger with a dark nuance. If only a touch of warmth is to be added in the highlights, 520 is the better choice. This also applies to double toning with iron blue toner, which will be discussed at a later stage.

All thiourea toners are highly alkaline! Fresh solutions start toning abruptly. It is an early sign of exhaustion of the toner, if the print is not fully toned after 30 seconds. Instead of extending toning times to one minute and above, you should regenerate with alkali. If prints are left too long in highly alkaline baths (here it goes up to pH 13.4) the gelatine can soften, resulting in a dull surface after drying. For that reason toning times should not exceed one minute. Some hardened papers survive such tortures for a couple of minutes without showing a sign of damage, but other brands react extremely sensitive, especially when the paper comes fresh from the factory. If surface problems occur already with shorter times of toning, drying in-between can be a remedy. Otherwise the gelatine has to be hardened prior to toning (see hardener).

Warmtone papers: Select VC, Forte Polywarmtone, Bergger Prestige, Adox Polywarmtone and Fomatone. Silver chloride emulsions and mix emulsions with a high content of chloride silver tone in a yellow tint, after bleaching. This is irrespective of the nature of the toner and little dependent on the composition of the bleach. It does not make a difference, whether the toner was thiourea (like here) or sodium sulphide or polysulphide.



untoned



bleach Ferrizyanide, Bromide 5:20 g/L
light bleaching only in 8 (!) secs, toner 525 30 secs



Ferri/Bromide 5:20g/L in 30 secs bleached to the deep shades



Toned in 525 30 secs, with Warmtone papers the colour turns yellowish, due to the pH value of this toner.

All other papers, except chloride silver show darker brown tones after a weak bleaching.

MT3 Vario toner

The matching table of my thiourea toner (MT3 Vario) shows the variation range of the color tones. The color saturation becomes higher the more alkali solution is added to the toner.

Tonerpart Thiourea, Activator means alkaline solution

	A	B	C	D	E
	brownblack	medium brouwn	yellowish brouwn	dark yellow	bright yellow
Tonerpart	50ml	50ml	50ml	50ml	50ml
Controller/Activator	5 - 30ml	50 - 60ml	90ml	130ml	180ml
Water	930ml	900ml	860	820ml	770ml

The bleach concentrate of the MT3 is diluted between 1+10 and 1+200. A dilution of 1+75 works sufficiently slowly to be able to assess the progress of the bleaching. Bleach diluted to 1+50 or higher requires only two to five minutes of washing before toning to remove the yellow coloration of the gelatin.

Caution: Bromide silver papers require a longer bleaching time, or a stronger bleach than chloride silver papers.



Ilford MGIV in SE6 BLUE



MT3 Vario

If only the highlights are to take on a warm tone, bleach briefly at dilutions of 1+20 to 1+50. The higher the dilution, the smoother the transitions.

Here, bleaching was done for 40 seconds at 1+30, and toning was done for 30 seconds in adjustment B.



With the same toner setting, the degree of bleaching determines the image tone. Left bleach 1+40 3 minutes, right 2 minutes. Paper MGIV in SE3 COLD.



On Ilford MG Warmtone the bleaching progress is faster than on MG IV. After bleaching the highlights in 1+40 for 30 seconds, I toned in setting D..



© Nick Hermanns
Select Ivory/ Forte PW17
Bleached to the mid tones, toner setting 50:100:850ml



Fomatone
Bleached to the mid tones, toner setting 50:100:850ml



Kentmere Fine Print VC
two tray development Catechol and Sepia



Bleach 1+40 30 seconds,
toner setting E 30 seconds



Kentmere Kentona

Setting E produces a reddish-brown image tone with high shadow density, even if the image has been completely bleached, as in this case.



Due to its high silver content ADOX Nuance (Fotokemika EMAX) can be toned in MT3 towards bright yellow tones as well as red-brown or warm black hues.

An even wider variety of tones can be reached by pre-toning in selenium or sodium-sulphur.

Left the untoned print



Bleach 1+40 1:30 mins



Toner setting C

Bleach in a high dilution, if only the highlights are to receive a touch of warmth.



Bleach 1+20 30 seconds



Toner setting A



Bleach 1+10 30 seconds



Toner setting E

Often it is an advantage for the image contrast to stop the bleaching process before it wipes out the deepest shadows.



Pre-toned in selenium 1+10 for 2½ minutes
Bleached in 1+20 for 1 minute



Toner setting C



Vortönung MT5 (direkte Tönung mit
Schwefelnatrium) 1+10 1min
Bleicher 1+20 1min



Tonerabstimmung C

The toning effect is not visible until bleached.

If you want the toner to reach the shadows fully, you would have to allow bleaching to go just as far in the shadows. This would mean a loss of contrast and density. Instead of this, you can pre-tone with either selenium or sodium sulphur to protect the shadows from being bleached away.

If you use selenium toner, depending on the duration of toning, you protect either only the shadows or also the mid tones. As selenium toner always starts in the shadows it is a question of toning time whether the mid tones are protected or not. Solutions of sodium sulphide, on the other hand, affect the complete range of tone values. Pre-toning in sodium sulphide for only 1 minute is very effective and leaves only little silver for bleaching. There is only little loss of density in the bleach. Only now is the colour of toning visible. Beside the silver-sulphide from toning there is a small amount of silver salt left, which can also be transferred into silver-sulphide by sulphurising. For this purpose you can either tone again in MT5 (sodium sulphide) or in MT3 (thiourea).

Part 2 Direct and indirect MT4 Siena and MT5 Sepia sulphur toners on Ilford-Papier

Ilford Multigrade IV



SE6 Blue development, without toning

MT4 Siena 1+20 1 min

MT5 Sepia 1+10 3 mins

Compared to other papers, Ilford MG IV reacts rather slowly to all kinds of toning. Apart from selenium toning - which is hardly visible on this paper if you used a neutral tone developer - all other methods of toning lead to the expected results. It just takes a little longer.

MT4 Siena: The usual characteristic of polysulphide toners, to go on toning further in the final wash, is noticeable here as well; even if not to the same extent as with warmtone paper. With short toning times the shadow densities rise in a cool tone. The highlights show little change at first, but will tone onwards until dried down.

MT5 Sepia: Used directly without bleaching, the shadows turn cooler while increasing in density. Even with a strong toner solution (1+10), the highlights adopt a warmer tone only when toning time exceeds 2½ minutes.

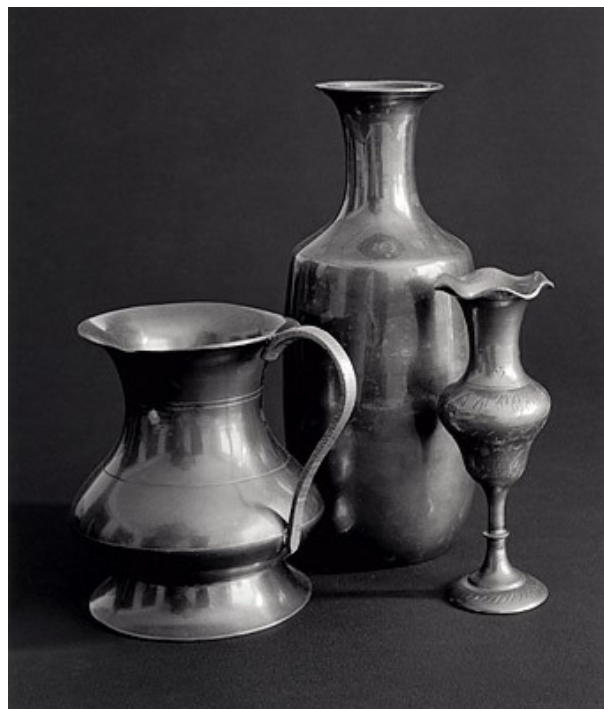
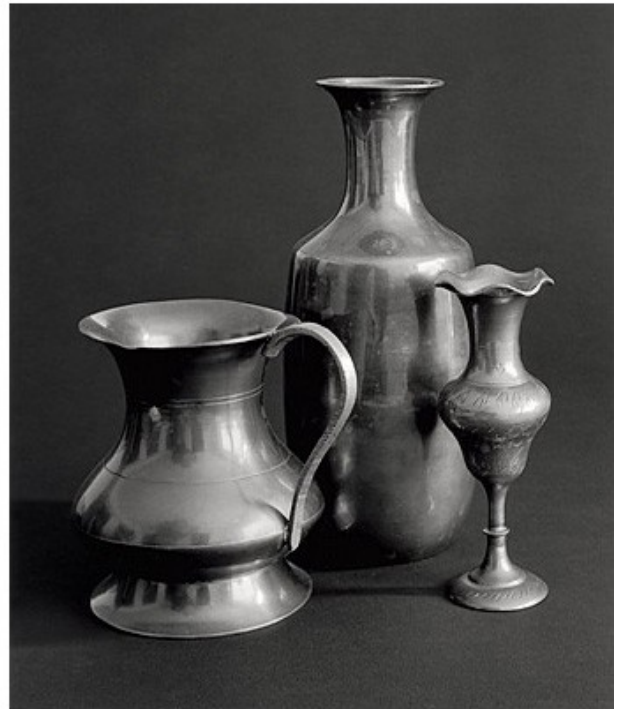
Direct sulphur toning does not necessarily give a brown tone with just any paper. Even if only a small change in colour is visible, the protecting effect on the silver is there. With suitable neutral- and coldtone emulsions, sulphur toner can also be applied exclusively for archival purposes. Similar to selenium, maximum black can increase enormously. In contrast to selenium though, even with short toning times the highlight densities receive a stabilizing effect.

The first two prints allow us to compare tone values and image tones.

MGIV neutral tone developer – without toning



MT1 Selenium toner 1+50 5 minutes

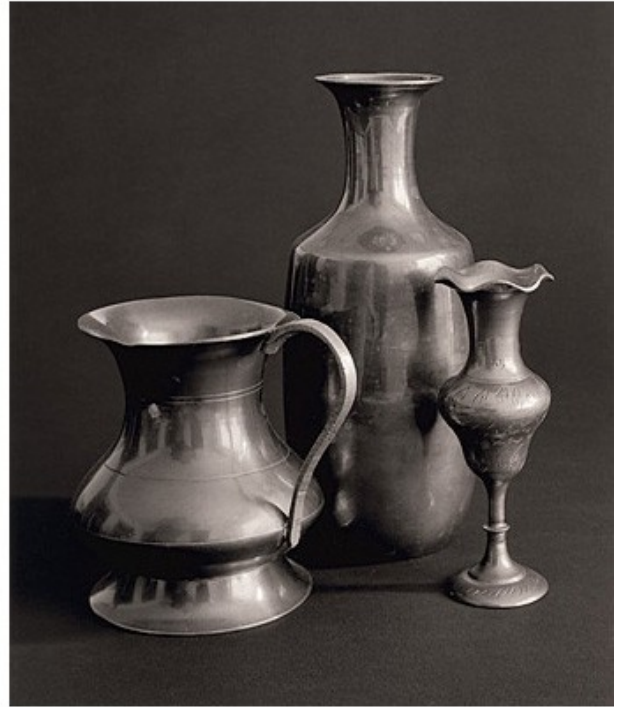


MT5 Sulphur Itoner 1+10 3 minutes

On this paper the image tone turns even cooler. The increase in density of the shadows is higher than with selenium toner. After bleaching the toned print, it is visible to which extent silver has been transformed to silver-sulphide. The print is not yet fully toned, but the protective effect is considerably higher than with selenium toner in a similar dilution for the same duration. With selenium the upper mid tones would not have been reached (compare to Toning in sulphur - part 1 and Toning in selenium part 1).



Bleached to control the extent of toning 1+20 for 90 seconds



toned again to stabilise the resulting silver salt

The example above is only to demonstrate the (invisible) effect of the toner, this print is now no longer archival, because the bleaching of the (not yet toned, metallic) silver has produced a (non-stable) silver salt - in this case silver bromide. Silver bromide is not only reducible to silver or silver sulphide by development or toning, it would "tone" over time (uncontrolled) by gas action.

The silver bromide must therefore either be dissolved by fixation or converted into silver sulphide by toning again. In the process, the density increases again and the colour tone becomes darker

Speaking of direct toners, a stronger shift in colours is achieved with MT4 Siena. If a continuous brown tone is desired, tone until the print looks the way you want it. After rinsing for 5 times (meaning changing the water in a dish for 5 times), stop the toning process in a sulphite solution. This prevents toning from proceeding in the final wash. Short times of toning of between 30 and 90 seconds, causes cold brown hues. Longer toning times result in more reddish colours..

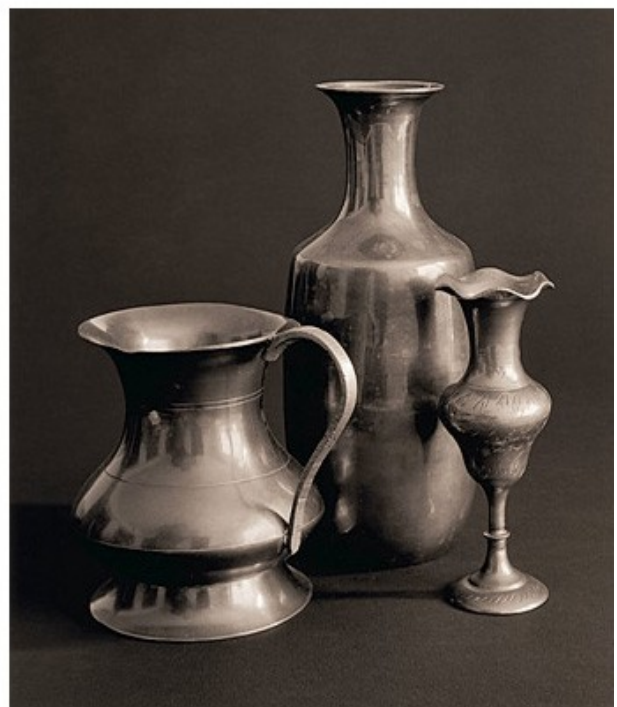


MT4 Siena 1+40 1 min with aftertoning in the wash



MT4 Siena 1+40 3 mins, stopped in sodium sulphite

If you tone for only 20 to 60 seconds at the same dilution and do not stop in sulphite solution and thereby allow the aftertoning, a split tone will appear. The highlights become reddish, the shadows greenish cold.



Multigrade IV toning indirectly (after a bleach) in Sulphur

With both sulphur toners, indirect toning is of course also possible, whereby it makes a difference whether long bleaching is used with a high dilution or short bleaching with strong approaches. A complete bleaching, i.e. until the deep shadows disappear, leads to a loss of contrast as we know it from toning with the odourless thiourea toner.

However, if you bleach only up to the mid-tones, or at least leave the shadows, the density of the shadows and thus the original tonal impression is largely preserved.

If, for example, you bleach up to the upper mid-tones, the bleached areas in the toner are almost abruptly "re-developed". If you stop toning after about 20 seconds, the shadows remain only slightly impressed, the "edge" between toned and untoned areas is still more or less pronounced, depending on the dilution of the bleach, and only with longer times does a colour change appear in the shadows - the transitions appear smoother.

If you want to exclude the formation of an edge from the outset, or if you want the highlight tone to appear as little yellowish as possible, pre-tint in selenium or sulphur. A short toning in rich selenium toner only protects a part of the shadow density, so after bleaching only the shadows are in red tone with reduced density, the rest of the image is accessible to the sulphur toner.

After a (also short) pre-toning with sulphur sodium, all tonal value areas remain visible after bleaching.

With the somewhat longer selenium toning of five minutes at 1+10 dilution, a selenium image remains after almost complete bleaching of the residual silver, which extends into the mid-tones.



Bleached after Selenium 1+10 1 Minute



Then toned with MT5 1+10 45 Sekunden

After sulphur toning, a reddish-brown tone then appears from the shadows to the midtones, the highlights not yet reached by the selenium toner appear reddish-brown to yellowish.

indirekte Tonung (without pre-toning) with MT5 Sepia



bleach 1+20 60 seconds



bleach 1+10 60 seconds



Toner MT5 1+10 60 seconds



Toner MT5 1+10 60 seconds

Ilford Multigrade Warmton

A good example of the "differentness" of the reaction to sulphur is Ilford's warmtone paper. Because of its finer grain, all toning processes take place much faster than with MGIV, the colours are more intense, the colour spectrum is wider.



Left: MGWT with its typical greenish-warm tone.

Direct toning in MT4 Siena produces an intense colourfulness, if aftertoning in water is allowed.

Direct toning with MT5 Sepia, on the other hand, only increases the density, the highlights become colder.

More colourful results are achieved with this toner after bleaching.

Compared to MGIV, MGWT bleaches much faster, so either increase the dilution or shorten the time.



MT5 Sepia 1+10 5 minutesMinuten



MT4 Siena 1+40 30 seconds



Bleach 1+20 30 Sekunden - MT5 1 minute



Bleach 1+40 60 seconds - MT4 1+40 15 seconds



MMGT bleaches much faster than MGIV. A bleach dilution of 1+20 is already too strong for controlled bleaching, after 30 seconds the mid-tones are reached, at 60 to 90 seconds the bleaching would be through to the shadows. If a more subtle colour is desired with indirect toning with MT5, the bleach must be diluted 1+40 to 1+80 to achieve times between 30 and 60 seconds.

Pre-toning does not bring about a significant change in shade, the density is slightly higher, the shadows appear less reddish.

MT5 1+10 5 mins, bleach 1+20 30 sec,s MT5 1 min



At high dilution (1+80 or more) and short times (15-30 seconds), only the highlights are fully bleached, the transitions to the midtones are smooth, the highlights get only a hint of colour. With longer times, midtones and shadows are also slightly bleached in thin bleachers. The bleached areas appear yellow after toning in MT5, towards the shadows the tone becomes greenish.

Bleach 1+80 90 seconds
Toner MT5 1+40 30 seconds



For comparison, here is an example of carbon toning. The way this (sulphur-selenium) toner works with direct toning differs fundamentally from that of the MT4 and MT5. As with MT5, at the beginning of toning the maximum blackening increases, the image tone becomes colder.

After about one minute, the hue slowly changes to an aubergine tone, with the tone of highlights and shadows remaining uniform up to a toning time of three to four minutes.

With longer toning times, especially with higher dilution, the highlights become warmer to a reddish yellow, the shadows become warm brown.

MT2 Carbon toner 1+15 3 minutes

With direct toning in MT4 Siena and all indirect sulphur toning, the MGW already shows a tendency to split toning after development in neutral to cold tone developers. This characteristic becomes much more intense when printing with higher light quantities and slow developers. The extremely slow catechol developer SE20c, for example, needs an overexposure of more than one f-stop if it is to produce full gradation when used alone. However, two-bath development in combination with the SE1 sepia is sufficient to produce two-tone gradation with slight overexposure followed by toning in the MT4 Siena, which is different from the same toning after "normal development".

All toning examples shown up to this point were developed in the neutral tone developer (SE4 Neutral). It is by no means irrelevant which developer is used before toning. Whether a warm or a cold developer should be used in a particular case must be determined by trial and error. With one or the other toner the differences can be so small that they can only be seen in direct comparison, with the MT4 they are obvious even without comparison.



Two-bad development Catechol/Sepia
Toning MT4 Siena 1+50 20 seconds

The prerequisite for this shade is either an extremely high dilution of the toner between 1+100 and 1+500, or, as here with 1+50, a short dwell time in the toner bath and subsequent post-toning in the first water bath. Here, toning is not interrupted, only toner dilution takes place. The print remains in this bath for one minute or longer, whereby it should be noted that this toner is still effective at dilutions above 1+1000. In the interest of reproducibility of toning, this "post-toning time" must also be noted! Then two to four changes of water in the tray follow until no more turbidity is visible, followed by extensive watering. During the soaking and even during drying, the image tone will still change. Before the first water bath, the colour is still uniformly brown.

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If you want the tones of highlights and shadows to be further apart, you have to increase the amount of exposure and the second developer has to be further diluted.



Part 3 Direct and indirect Sulphur toning with MCC



The new version of MCC - manufactured under the ADOX label - differs from the Agfa-MCC only in the colour of its base. The slightly creamy tint has been altered to a pure white base-colour. If this is to stay will ultimately be decided by the consumer. For my taste, the paper gained in brilliance by that step. As a consequence, in the same developer especially the highlights come out cooler. All control over the image tone by choice of developer remains the same. This also applies to all toning techniques.



Infra-red photo on Efke in Finol

Left the untuned print, developed in SE4 Neutral



MT4 tones faster and more intensive than MT5. Despite a higher dilution and a shorter time of toning, if toning was stopped in a sulphite bath the results are hard to separate.

On the left MT5 Sepia 1+10 for 4 minutes



MT4 Siena 1+40 for 45 seconds

After washing for only two times the toning process was stopped in a 10% Sodium sulphite bath.

Below you see how far toning would have progressed, if we had not stopped the process.



MT4 Siena 1+40 for 20 seconds

Toning progressed in water for 1 minute before the print was washed for 30 minutes.

This print was toned for a shorter time in the same dilution.

Allowing further toning during the wash, the result is a red-yellow cast up to the mid tones and blue to blue-green shadows. If you either dilute the toner more or leave the print in the toner for a shorter time while leaving it for a longer time in the first rinse water, the split effect will be more intense.



MT4 Siena 1+40 for 90 seconds - stopped in a sulphite bath

Toning in the same dilution for 60 to 70 seconds, results in a continuous dark brown colour. After that time the tone becomes more red.

This print was toned for 90 seconds and rinsed briefly. Then the toning process was stopped in a sulphite bath.



Carbon toning causes cooler tones. In the early stages of toning a shift towards blue-black is observable and maximum black increases. After around 30 seconds the colour shifts towards magenta. Even with toning times of more than 8 minutes, shadow densities do not decrease (on this paper in strong toner solutions). This is to be taken into account when printing. If carbon toning is envisioned, highlights as well as shadows have to be a bit lighter.

MT2 Carbon Toner 1+15 for 4 minutes

Indirect toning

All toners that have a direct impact on the silver can also be used for indirect toning (after bleach). However, the image colour always tends towards an unpleasant yellow tone. Bleached identically, MT5 produces the least degree of yellowing.



Bleach 1+40 30 seconds
MT5 Sepia 1+10 60 seconds



Bleach 1+40 30 seconds
MT3 Vario i with setting A 30 Sekunden

Where the use of sodium- or polysulphide toner is no advantage over odourless thiourea - when toning indirectly - the choice is easy. Here it turns obvious that toning in sodium sulphide goes beyond the bleached areas. With increasing time of toning the shadows will also be affected. Thiourea toner, however, cannot tone the remaining metallic silver, but only the areas where it finds silver salt (in this case silver bromide).

Pre-toning: toner - bleach - toner

Continuous red brown hues from highlights to shadows can be achieved by pre- toning in sulphur- or selenium toner. If you want to avoid the smell of sulphur toner, you can use selenium toner to achieve a comparably wide spectrum of red- brown to yellow-brown colours in combination with thiourea. As selenium toner works from shadows to highlights and protects the silver from the bleach, the time of toning determines how far the toning process is extended from the highlights into the mid tones. The colour intensity is controlled by the degree of dilution. Strong dilutions for a short time tone only the shadows. Only with longer times of toning the highlights are reached as well. Colour saturation is high. After bleach, there is only little bromine silver left for the sulphur toner. Nothing is left to turn yellow. Only the reduced density - due to bleaching - will be re-increased. With longer times of toning in stronger dilutions, the highlights will be reached a little later, but the shadows will not be completely toned. After toning in sulphur the colour will be less red.

Once more I want to point out that the selenium toners of all manufacturers that I know of contain thiosulphate, so that you have to rinse thoroughly before bleaching. If you use an alkaline fixer, you don't need to rinse between fixer and selenium toner. After using a sour fixer you should rinse for around 10 minutes.



Example: MT1 Selenium 1+10 for 2 minutes

The shadows show the typical tone of selenium. After bleaching, you see that the lower mid tones have only just been reached. The highlights have completely vanished.

If you tone the bleached areas in sulphur, you will still get a slightly yellowish tint.

MT3 Vario sulphur toner (thiourea)
setting E for 30 seconds

In contrast to normal indirect toning, the pre-toned shadows also receive a reddish brown tone.



Example: MT1 Selenium Toner 1+10 for 6 minutes

After about 3 minutes, in a strong dilution you get a split tone. The shadows appear red and the densities that have not been fully toned separate clearly in a cooler colour. The progress of toning is easy to judge. Only when the highlights change from initially blue to the red of the neighbouring densities, will they remain after bleaching.

After 6 minutes not all the silver has been transformed to silver selenide. After re-halogenation, the small rest amount can be toned in thiourea.



After bleaching, the changes in colour and brightness are so minimal that they are only visible on the wet print.

To the left: treated with Photoshop to demonstrate the state of the print before drying.



After pre-toning in Selenium and bleaching
toned in MT3 Vario setting C

In contrast to pure selenium toning, saturation in colour increases slightly and maximum black remains as it is.



Pre-toned in sulphur sodium

left: MT5 1+10 for 4 minutes

below left: bleach 1+80 for 90 seconds

below right: MT3 Vario setting A with less colour saturation

Whether the second time in a sulphur toner is in sodium sulphide or in thiourea is of no importance for the result, so that I chose for the odourless option.



Over-toning with Selenium



Instead of as a pre-toner, selenium can also be used after sulphur toning. Depending on the duration of toning, the greenish shadows, which have only been slightly toned, adopt a more or less intense tone of selenium. In this example, toning was in a dilution of 1+10 for 5 minutes. Not only the shadow densities got affected as usual with Selenium, but also the highlights received a reddish hue.