

ADVANCED TONING

TONERS

Toning may be used as a protective measure or as a way to add interesting shifts in the tonal characteristics of a print for aesthetic reasons. Follow the instructions in this booklet combined with those included with whatever chemistry you are using. There is no set way to tone prints. This is a very personal part of fine photographic processing. Superior results are the result of continued experimentation. Try as many variations on any of these processes and please share your results with the rest of the class.

TYPES OF TONERS

Three categories of toners are available that alter the tonality of photographic prints. The result is a wide range of colors other than the basic black and white provided by silver based printing papers. There is also a whole range of non-silver based photographic processes that are taught as part of a Non-Silver Alternative Photo Processes course.

Each photographic paper will react with each of these toners differently. The type of developer you use and the method of fixing you employ will all affect the look of the toning. Even different types of negatives will respond differently to the same toning. The only way to find out what does what to whom is to experiment with the many different combinations and variations and share this information with your fellow students.

SILVER CONVERSION TONERS

These toners chemically change the silver in the emulsion. These include Selenium, Sepia, Poly-Toner, Copper / Brown, Yellow / Gold Toner, Blue Toner, Halo-Chrome, and Protective Gold Toner.

COLOR COUPLER TONERS

These toners plate the silver with a color dye. These include the Edwal and Berg Color Toners and Rockland Select Chrome.

DYE TONERS

These toners add a uniform color to both the emulsion and the paper. Rockland makes Print-Tint toners. In addition, anything that will stain paper can be used to change the tonality of a photograph, tea, coffee, wine, beets, blood, urine, etc....

BATCH TONING

It is not necessary to tone at the same time you are printing. Prints that have already been processed and dried can be toned at a later date. It may be a good idea to finish all your printing, making several copies of the final image, and then come into the lab some other time and have a toning party with some other students. It is advisable to hold on to even the mediocre prints to use for experimentation.

SAFETY

All toner chemicals are VERY TOXIC! Always wear gloves, and a vapor mask is recommended. Do as many prints at once, in an attempt to reduce unpleasant environments as well as save on chemistry. It may be worth your time to arrange to tone with other students and experiment together. Report any successful toning adventures to the entire class, please. Report toning disasters too!

TRAYS

Trays and any other tools used with toners must not be made of metal, which will chemically react. Pour out exhausted Toners at the end of the session as close to the drain as possible. This will avoid excess contact with the stainless steel sinks. Toners have a tendency to stain our plastic trays, so be sure to clean everything thoroughly with tray cleaner available from the Lab Monitor.

SILVER CONVERSION TONERS

These toners convert the silver in a photographic image to some other insoluble material. This alters the color of the print without affecting the photo paper. The colors available range from a subtle brown or purplish tinge all the way to bright pinks or reds, with more vibrant colors coming from using more than one toner on a print.

The way you process your print greatly affects the action of toners. The type of developer used, the length of development time and temperature can generate wide variation in the toning results. Consistency is important, so you can gain control of this seemingly personal process. When you are in the experimentation stage, write everything down so that when you get something unexpected, you will know how you got it.

SEPIA REDEVELOPING TONER is a two step process where the toning is preceded by a bleach that removes the color from the silver. The silver is then converted and a brownish tone is imparted. The bleach attacks the highlights first, and the sepia will only tone the silver that has been affected by the bleach. This makes it possible to split tone by bleaching for only 10-20 seconds, rendering the highlights brown and leaving the shadows black. It is possible to combine Sepia with other toners for varying effects. It is important to remove all traces of yellow created by the bleaching by rinsing the print before toning. After Sepia toning you must fix the print, Perma Wash, and then do a full final wash. The effect of Sepia toning can be reversed by placing the print into Dektol.

SELENIUM TONER was primarily developed as a protective toner that coats the silver grains in the emulsion. This increases the archival properties of the print. As a result the image will take on a darker and richer appearance. Photos should be printed with less saturated shadows than normal if they are to be toned in selenium. If selenium is over done it creates a color change from blue-black to purple-black to a reddish tone depending on the paper used. Many people find this color change desirable. Selenium works from the shadows up, making split toning possible. It can also be combined with other toners but must be used last, as it seals the silver crystals.

KODAK POLY-TONER is a variable solution which imparts tones all the way from the cold tone of Selenium through the warm brown of Sepia all the way to an orange color. A range of dilutions and appropriate processing times are described on the package.

BERG PROTECTIVE GOLD TONER will produce rich blue-blacks when used on its own or can create rich reddish tones when used after Sepia toner. Full directions are on the package. BERG BROWN / COPPER TONER will produce more reddish-brown tones than sepia if you use a strictly non-hardening fix before hand. If a hardening fix is used the print will split into copper shadows with grey highlights. In either case the print can be pulled from the toner prematurely to increase the split toning effect. For more subtle effects dilute this toner 1:1 or 1:2.

BERG GOLDEN / YELLOW TONER can produce a bright metallic orange or yellow tone. For a more subtle golden yellow effect dilute the toner 1:1 or 1:2. The effect of Golden / Yellow and Brown / Copper can be reversed by placing the print into Dektol.

BERG BRILLIANT BLUE TONER produces a bright blue tone similar to cyanotype. The best results come from prints that are lighter than normal. Berg says that redeveloping in Dektol 1:6 can reverse the effect of either Berg Blue or Berg Cooper toners.

ROCKLAND HALO CHROME converts the silver image to a metallic mirror look by fusing together the black colloidal silver particles. Either a silver on white or black on silver appearance can be obtained. See the instructions packaged with the toner solution.

SEPIA TONER

Sepia Toner gets its name from an artists' pigment made from the common Cuttlefish that lives in the English Channel, *Sepia officinalis*. Sepia Redeveloping Toner falls in the category of a conversion toner because it chemically alters the silver in the print. Sepia toning is a two-step process, sometimes known as an 'indirect toner'. First the color is removed from the silver in the emulsion by a Ferricyanide- Bromide Bleach. The bleach is thoroughly rinsed off. Then the Sepia Sulphide Toner imparts a new color to the silver; usually a brown to reddish-brown tone.

Technically the ferricyanide-bromide bleach converts the silver halide in the emulsion to Silver Bromide. The Sepia Toner then converts these crystals into Silver Sulfide that is actually more stable than metallic silver. The actual tone varies greatly depending on the negative, the brand and type of paper, and how the prints are processed in Fixer, Fixer Remover and Final Wash. The formulae of both the bleach and toner can also be varied to extend the range even further.

This process works from the highlights down. The bleach affects the highlights first because there is less silver in those areas. The sepia will only tone the silver that has been altered by the bleach. This makes it possible to 'split tone' by bleaching for as little as 10 to 30 seconds, rendering the highlights brown and leaving the shadows black.

The variable toner supplied by FotoSpeed is a set of three small bottles. Part 1 is the Ferricyanide-Bromide Bleach, while Part 2 is the Thiocarbamide or Thiourea Toner. The third bottle is an Activator made of sodium hydroxide that changes the pH and therefore the color of the toner. Set up five trays, one to hold a reference print under water, one for Bleach, one for a Water Rinse, another for the Sepia Toner w/ Activator and the last as a Water-Bath Holding Tray to use before the Final Wash. Use the properly labeled trays so it is clear to everyone in the lab what chemistry is being used where.

It is very important to remove ALL traces of yellow created by the bleaching by rinsing the print before toning. After Sepia toning you must then do a full Final Wash. The effect of Sepia toning can (theoretically) be reversed by placing the print into Print Developer. It is also possible to combine Sepia with other toners for varying effects.

TONALITY

The effect of Sepia Toner on photographs varies greatly depending on the brand and type of paper used. Warm-tone papers are generally more receptive, since they have smaller grain. [The smaller the grain the warmer the tone of the paper.] Some brands tone deeply while others are more subtle. The degree of fixing also has an effect. Be careful to fully and precisely Fix using the two-bath method, followed by Fixer Remover and a thorough Final Wash. If there is any Fixer remaining in the print, stains will appear that will be impossible to remove.

BASIC SEPIA TONING PROCEDURE

PRINTING ADJUSTMENT

The color that is removed by the bleach in the top highlights is never regained, partially because the black silver halide is being replaced by brown silver sulfide that is less dense and lighter on color. It is recommended that prints to be Sepia Toned have darker highlights.

One way to achieve this is to make a perfect print, and then make other prints one stop darker. The problem with this is the shadows may become too blocked up even after being bleached.

The best method may be to add the extra exposure with a #0 filter. This will darken the highlights without affecting the shadows. To do this, make the 'perfect' print, then place a #0 filter under the lens and make second exposure of the same time. Experimentation will yield the best way of working for your individual printing style.

BLEACHING

The Bleach bath removes the color from the silver in the print. The longer you leave your print in the bleach the more color is removed. The bleach attacks the highlights first. Only the silver that has been affected by the bleach will change color in the sepia bath. The length of time the print is left in the bleach is used to control the balance of black to brown to white. Bleaching by as little as 5 - 20 seconds removes just some of the color. The shadow areas will remain black while the highlights will turn sepia brown when toned. Bleaching a lot removes most or all of the color, yielding a print that will be almost entirely brown and white when toned. Keep your eyes open when bleaching. It is very important to have an un-toned reference print in water nearby.

RINSING

Take the print out of the Bleach and hold it over the bleach tray letting as much bleach drain back into the tray as possible. Be aware that the print continues to bleach while it is draining. **It might be better to pull the print from the bleach before it has reached the desired tonality.** Then immerse the print in a tray of water to rinse. It is imperative that ALL bleach be rinsed from the print before placing it in the Toner. **Too much carry over of bleach into the sepia tray will contaminate the toning chemistry and it will become useless.** The water in the rinse tray should be changed whenever it gets too yellow, usually after every few prints.

TONING

The rinsed print is then transferred to the Toner bath. The change in color happens relatively quickly, and after several minutes the print will not turn any further brown. If the effect is not strong enough the print may be re-rinsed and then put through the cycle again. A fully sepia toned print will not look as dark as an un-toned print because the black color of the silver is being replaced with sepia which is brown and less dense. This is why it is recommended that you print darker than normal when you know you will subject that print to sepia toning.

FIXING and WASHING

It is recommended that you re-fix the print after sepia toning, since sepia is a redeveloping toner. Use a non-hardening fix and follow the steps listed on the Fiber Base Printing - Archival Processing page. This same information is displayed in cookbook style on the chart above the sink. Complete the processing with a full final wash.

SEPIA TONER, cont'd.

TONER CAPACITY

Do not mix up any toner just to tone a couple of prints. A 30 oz. tray has a capacity of toning 25- 8" x 10" prints, more if the image is significantly smaller than the full paper size. If you do not have at least 25 prints to tone, find someone else to tone with!

It is suggested that students work together and tone a larger group of prints. Unless the chemicals are exhausted, leave the filled trays out in the lab and clearly label what is in which. This will allow other students to tone their prints without bankrupting the Photo Lab. Do not, however, leave trays if you do not know if anyone else will be toning later. This just creates havoc in the Darkroom and can take up unnecessary space in the sink.

PRACTICAL BLEACH USE

The bleach that comes with the Fotospeed Vario kit works in a peculiar way. The change in the chemical composition of the silver is not always readily visible.

For lightly sepia toned prints, put the print into the Bleach bath for only 5 seconds.

Remove and then wash thoroughly.

Additionally you can do a 5-second bleach, remove the print from the bleach bath, then place it in a holding tray. Watch the print carefully until the residual bleach starts to lighten the silver. Then wash with water to halt the bleaching action.

ALTERNATE BLEACH USE

If you are only bleaching, DO NOT USE the bleach from the Sepia Toner kit. This will leave the Lab with Sepia Toner kits with no matching Bleach component. Use either Ferri Bleach or Bromi Bleach (recipes for these bleaches are at the end of this document). Ferri Bleach will produce a more reddish (warm) tone, while the Bromi Bleach will render the print more yellow (cool). These two bleaches can be mixed 1:1 to produce the equivalent of what is in the normal Sepia Toner Kit, Bleach, Part I.

Both the Ferri and Bromi bleaches can be used in place of the standard Sepia Toner. Especially if you want a better visual shift when you are toning. Each will cause the Sepia toner to render different tonalities.

KEEPING TRACK

Write numbers on the backs of the prints so you or your friends can write down what you are doing as you tone, especially if you work in a more intuitive way. It is important that you know how to reproduce a toned print, especially if you get something unique that you really like. Otherwise you have not really learned much.

SELENIUM TONER

Selenium toner is best known as a protective toner and is used by most people printing high quality prints as a standard step in the finishing steps of the processing. It is possible to use stronger dilutions and extended times to create a color change in the print. Ansel Adams warns about this 'undesirable' change, but we are in art school, which tends to reverse normality.

PROTECTION

Selenium works from the shadows up. It coats each silver crystal in the emulsion. This makes each grain slightly larger and slightly darker. The result is a darker, richer print. It is advisable to print your photos a little bit less saturated in the shadow areas than usual to compensate for this shift. Use Rpaid Selenium toner mixed 1:9 from the gallon jug or dilute to 1:20 for an even more subtle protective layer.

COLOR CHANGE

Leaving prints in selenium for a longer period of time will cause a shift in color toward the blue-black and even a violet-black, depending on the paper used. When used after Sepia a reddish color is imparted. On the other hand a very quick immersion in selenium can produce a drastic change in only very certain areas of the shadows and midtones. This is called split toning and can be very difficult to control. Many artists pride themselves, however, on their magical ability to split tone.

TONING WHEN PRINTING

If you wish to use selenium during the initial printing regimen, the entire process is detailed in the Fiber Base Paper - Archival Printing with Toning page, further on in this booklet. After an initial treatment in Perma Wash, a hypo-clearing agent, followed by a quick rinse, the print is transferred to a tray of Selenium mixed with more hypo-clear. (Kodak recommends transferring the prints from the fix2 tray directly into the selenium toner with hypo-clear. We have found that this causes staining problems that they say this technique will cure.) The nominal timing is 2 to 5 minutes. The actual timing depends on the desired effect. It is very helpful to have a reference print in another tray of water for comparison. Selenium can be hard to see until after the print has dried down.

BATCH TONING AFTER PRINTING

Since selenium is a coating toner it is always used last, except for protective gold toner, that also coats the silver. If you want to use other toners in combination, eliminate the use of Selenium in your standard printing scheme. Process your prints according to the Fiber Base Paper - Archival Printing page. Do a final wash and dry your prints to be batch toned at another time. When toning at a later date and when toning in combination with other toners, merely set up a tray of selenium, and process prints that are already wet. Everything else is the same as mentioned above. Toning should be followed by a final wash as usual.

TOXICITY

Selenium is a deadly poison. It acts like Mercury – once in the bloodstream, it will never leave.

The Selenium in the lab is quite dilute but precautions must be taken so it does not touch your skin. ALWAYS WEAR GLOVES when using Selenium toner, especially when setting up your trays and when cleaning up.

If you spill any toners onto a table surface, be certain you clean it up. The solutions are clear when being used, but they dry to form brightly colored puddle stains. After finishing a toning session, scrub down the area where you have been working with Soft Scrub.

TONING VARIATIONS

FULL SEPIA TONING

FULL BLEACH> RINSE> SEPIA TONE> WASH>

Leave the print in the bleach until almost all of the color is gone. Wash the print for at least 2 minutes. Then immerse the print in the toning bath. All tones in the print will shift to brown, including the shadows. This may cause a loss in contrast and a weaker looking print because the appearance of the shadows is no longer a deep color.

SPLIT TONING

SHORT BLEACH> RINSE> SEPIA TONE> WASH>

Reducing the time in the bleach bath to a much shorter duration will only affect the highlights and maybe the midtones. A time as short as 5 to 30 seconds will produce a very subtle warm tone to the top end of the print. A slightly longer bleach bath will produce sepia-brown highlights. An even longer bleach bath will allow the midtones to bleach out and then they will also appear brown. Again – it is the time in the bleach that controls the color of the print, not the length of time in the Sepia Toner.

DOUBLE TONING

SHORT BLEACH> RINSE> SEPIA TONE> RINSE>

SHORT BLEACH> RINSE> SEPIA TONE> WASH

This is an extension of Split Toning technique. Bleach for a very short time, and tone as usual. This will affect only the top highlights. Then bleach and sepia tone a second time. The highlight areas that absorbed the Sepia Tone in the first pass will resist the second bleach. The result is a bleaching and toning of a second band of tone in the lower highlights and some midtones. This produces an extended range of altered tonalities. Using different blends of Vario Sepia Toner will produce even greater variation in color!

This can be done several times more; each time the color of the toned areas will be different. There is no easy way to predict what these colors will be, due to the differences between papers and processing.

REVERSE TONING

SEPIA> RINSE> BLEACH> RINSE> SEPIA TONE> WASH>

Placing a print in the Sepia Toner before the Bleach Bath adds sulfide to the silver. This makes it react differently to the bleach. The result is a cooler tone, especially in the shadows. Tim Rudman refers to this as 'pre-sulfiding'.

POST-DEVELOPING

BLEACH> RINSE> SEPIA TONE> RINSE> WEAK DEVELOPER> RINSE>

BLEACH> RINSE> SEPIA TONE> WASH>

Placing a print in a very weak Print Developer after the Sepia Toner 'redevelops' the silver back to black color, sort of. Repeating the normal Bleach + Sepia process produces a different color. This can be repeated for yet another color! Mix 1 oz. of Sprint Quicksilver or Edwal Platinum II Print Developer into 29 oz. of water, as described on the Toner Recipe chart.

TONING VARIATIONS, cont'd.

PRE-DEVELOPING

BLEACH> RINSE> WEAK DEVELOPER> RINSE> SEPIA TONE> WASH>

Placing a print in a very weak Print Developer after the Bleach but before the Sepia Toner alters the silver in a different way. The result is cooler darker shadows, to almost a cool-tone effect on some papers. The time in the Developer is the controlling factor.

Use the same mixture of Sprint Quicksilver or Edwal Platinum II Print Developer as described above.

INVERSE SEPIA TONING

FULL BLEACH> RINSE> VERY WEAK DEVELOPER> RINSE> SEPIA TONE> WASH

This is an extension of the Pre-Developing technique described above. The print should be fully bleached. Then it is re-developed in a very weak Print Developer. If this development happens slowly enough, then only the highlights and maybe some midtones get re-developed. This will inhibit the Sepia Toner and it will only tone the shadows that have not been re-developed. Be careful with this technique because it can easily produce 'tacky' results.

BLEACHING BACK

SLOW BLEACH> WASH

Simply bleaching a print can render beautiful results. A yellowish color is created as the bleach removes the color from the silver. If a dark print is bleached, the highlights will turn yellow-brown as they come back to the desired saturation and will have a somewhat degraded appearance.

This technique requires a print with darker highlights, because the color that is removed from the silver is never replaced. Two techniques to achieve this are described above under 'Printing Adjustment'.

SEPIA + SELENIUM COMBINATION

SHORT BLEACH> RINSE> SEPIA TONE> RINSE> SELENIUM

Selenium following a normal Sepia gives a beautiful tonal range, starting with warm sepia brown highlights into neutral midtones and down into deep violet shadows.

SELENIUM + SEPIA COMBINATION

SHORT SELENIUM > RINSE> BLEACH> RINSE> SEPIA TONE> WASH

Theoretically, Selenium seals the silver in a print. Practically, however, Sepia toner can be used after Selenium to produce a unique look.

BLEACH + SELENIUM

SHORT BLEACH> RINSE> SELENIUM > WASH

The Bleaching Back recipe above can be followed with Selenium to put a violet tone into the shadows. This is a very popular process. Since yellow and violet are complimentary colors, this is a good combination. Careful control can leave the midtones grey, a three-tone split!

If you are only bleaching, **DO NOT USE** the bleach from the Sepia Toner kit. Mix up a separate Bromi or Ferri Bleach. See the statement under 'Alternate Bleach Use', above.

Ferri Bleach produces a more reddish (warm) tone, while the Bromi Bleach will render the print more yellow (less warm). Each Bleach will render different tones when used with Sepia.

TONING TIPS

PAPER RECEPTIVITY

Each photographic printing paper has its own inherent tonality. These tones run from cold through neutral to warm and some call themselves very warm. «see the Selected Fiber Base Papers page» Each brand of paper also has its own response to toners. Some tone very quickly while others are very reluctant to tone.

In very general terms the major brands of photo paper respond as follows:

FOMA most highly receptive

ADOX highly receptive

ORIENTAL less receptive

ILFORD least receptive, most controllable, most subtle results

CROSSTONING

It does not necessarily follow that a warm tone paper should only be processed in warm tone toners. In fact, quite the opposite gives very pleasing results.

Below are two examples:

Cold Tone paper in a Warm Toner, e.g. ORIENTAL Cold Tone in Sepia

Warm Tone paper in a Cold Toner, e.g. FOMA Classic 133 in Selenium

SPLIT TONING

Some toners affect the shadows first while others start with the highlights. It is possible to stop the toning process before it is completed, allowing only the shadows or only the highlights to tone. This creates images with more than one color. This is a relatively uncontrollable effect and is usually spoken of in secretive terms amongst the people who actually practice it. They do not want anyone to know that it more chance than deliberate creativity.

Split Toning examples:

Sepia Highlights only

quick immersion in Bleach before Sepia toning only tones the highlights, leaving the shadows their original black tonality of the paper

Selenium Shadows only

quick immersion in Selenium can result in only the shadows being toned, leaving the highlights their original white to grey

COMBINING TONERS

All toners can be used sequentially, but in a particular order. The silver conversion toners should be used first in the order of sepia, poly, copper, selenium, gold. Any of the color coupler toners may then be used, followed by any of the dye toners. The print must be thoroughly washed between toners to avoid contaminating the toners with each other. Prints toned in different toners can not be washed together, because the toners will migrate from print to print, eliminating all your hard and careful work.

Toner Combination examples:

Sepia then Selenium creates a mixed tonality.

Since selenium is a coating toner, it is always used last.

Double Tone by using considerable sepia then considerable selenium.

The interaction of the two will produce a more reddish tone on warm papers

Two Tone by using moderate sepia then moderate selenium.

This renders only the highlights sepia, and the only the shadows selenium.

Tri Tone by using light sepia and light selenium.

This makes sepia highlights, selenium shadows, and keeps the mid tones grey.

TONING TIPS, cont'd.

SELECTIVE TONING

It is possible to only tone specific areas of a print by masking or covering specific areas. The most accessible mask is rubber cement, thinned with a little rubber cement thinner. It can be a little difficult to apply because of its consistency and since it is clear, it may not be obvious where it has been placed. Photo Maskoid Frisket is the brand name of a compound which also resists toner. If you purchase the transparent red rather than the opaque red, you can easily see what has been masked out and what hasn't. It is also a little easier to apply.

It is recommended that you use inexpensive brushes to apply masks, since this process will probably ruin them. Since toners react with metals, avoid any brushes with metal ferrules, or coat any metal parts with rubber cement.

BLEACHING

Sometimes the bleach used before sepia can create an interesting look just by itself. With the right negative the tones can split between yellow, brown and black. The result looks like a posterized effect. The only problem is that you lose some of the detail in the high end. It is recommended, therefore, that bleaching be done to relatively dark prints, as you would do for sepia toning. Also keep in mind that not every print has to conform to the earmarks of perfection. Sometimes no highlight or shadow detail is acceptable and even desired. It just has to be clear that that is the intended look.

BLEACHING

Bleaching is used more as a last resort device than a standard processing step, except when Sepia toning. Bleach can be used to remove silver from a print not unlike Farmer's Reducer. The entire print can be lightened, as in preparation for Sepia toner, or specific areas can be removed for special effects. If you have small black spots on a print (like dust spots in reverse), they can be easily removed with tincture of iodine that is sold at drug stores.

PROCEDURE for Overall Bleaching

mask _____ any areas you do not want to bleach
with rubber cement or Maskoid Frisket

Fix _____ the print in Non-Hardening Fix as a pre-soak

Bleach _____ for 15 seconds with agitation
be careful not to over-bleach, you can't un-bleach!
stains will appear - do not worry they will wash out

rinse _____ thoroughly in running water

repeat _____ the above process if more bleaching is necessary

Fix _____ in Non-Hardening Fix until stains are gone
should be less than 5 minutes

rinse _____ the print in water to remove the Fix

remove _____ any mask that was applied

Perma Wash _____ as usual

Final wash _____ as usual

CHEMICAL RECIPES

The Tyler Photo Lab only has the bleach that comes with the Sepia Toner. Please don't use one without the other. It is possible to mix other types of bleaches. You will have to do this on your own.

Standard Bleach:

water to start with	750 ml	24 fl oz
Potassium Ferricyanide	3 gm	1/2 tsp
add water to make	1 liter	32 fl oz (1 qt)

Permanganate Bleach:

Stock Solution A		
warm water	200 ml	6.75 oz
Potassium Permeanate	1 gm	0.035 oz
Stock Solution B		
warm water	200 ml	6.75 fl oz
Hydrochloric acid (concentrate)	20 ml	0.68 fl oz

this acid is extremely corrosive and dangerous even when diluted

Working Solution - mix fresh solution for each use
mix equal parts Solution A and Solution B
use 2 or more parts water for milder action

note: Do not use Clorox Bleach. It will completely remove all emulsion from your paper, leaving you with a blank white sheet!