Ethol Developers

Chemistry for Black & White Films and Papers

- **Ethol UFG** *film developer*
- **Ethol T.E.C.** *film developer*
- **Ethol LPD** *“Lasting Paper Developer”*
- **Ethol** *“Agitated over Agitation?”*

Ethol Chemicals, Inc.
701 Corporate Woods Parkway
Vernon Hills, IL 60061
847-821-5429

Ethol UFG film developer

Introduction: There is no miracle developer that will do all the things for all people. But Ethol UFG comes as close as a developer possibly can.

There is no miracle technical bulletin that can give you all the methods, techniques and probabilities within such limited space, but this bulletin will answer most major questions. If it does not, please contact our technical department.

Description: UFG is an ultra fine grain developer that is soft-working and will produce negatives of normal contrast, high acutance with extreme latitude. It may be used at temperatures from 60° to 90°F. It is recommended for all formats from subminiature to large sheet films.

UFG may be used in normal stock solution (full strength) and then replenished (or not, as you wish) as well as in one-shot form by using a dilution of 1:5. (See paragraph on dilution below). When UFG developer and replenisher are fresh, they may be anywhere from a clear to a slight yellowish-weak-tea color. This is normal and does not indicate oxidation. If you feel that the color is too dark and are concerned about the activity of the developer, we urge you to develop a control strip of film of 3 or 4 frames of 35mm film to assure yourself of the developers life.

Preparation: UFG in powder form should be dissolved in water at temperatures from 70°F to 90°F. It is advisable to mix at the coolest temperature possible since this will give you increased developer life. Preference is to mix with distilled, deionized or boiled water, for added life and improved negative quality. The liquid form UFG is ready to use.

Development of Film: The development times listed on the charts will give negatives of normal contrast based upon use in a double condenser enlarger. When using a cold light or diffusion enlarger, you will normally require 20-25% increase in development time. **Remember**: The times listed in the charts are derived from controlled laboratory conditions and will no doubt be different than the results you achieve; so do not hesitate to alter your times as required. Do not alter temperature - only times. If possible do not pour solutions in and out of daylight tanks. Preferably fill tanks with developer first, and in the dark, drop the loaded reel into it. Following development, lift reel out, then into next solution. Instead of pouring in and out. This contributes to more accurate timing and more uniform development of the negative. Negatives exposed by electronic flash having a duration shorter than 1/2000th second, will require from 25-50% increase in development time.

If your negatives are consistently too low in contrast, increase development time; if too high, decrease development time. **Remember**: Contrast is a product of development and density is a product of exposure.

Good Housekeeping: Cleanliness is a must. UFG, as well as other film developers can be contaminated by foreign matter; especially by fixers or other developers as well as impure water. This will cause rapid exhaustion. Tanks and reels should be cleaned periodically, particularly when changing from another developer to UFG. A solution of 2 oz. sodium sulfite and 3 oz. sodium carbonate per gallon of hot water is an excellent cleaner. Allow tanks and reels to remain in this solution over night, then rinse with hot water. Always rinse tanks and reels **immediately** after use and dry with a clean lint-free towel. From time to time, the developer may require filtering to remove particles of foreign matter due to the developing process. A stainless steel filter funnel is recommended.

Dilution: Where longer development times are preferred, UFG may be diluted. In the dilution method you will have greater control of time, slightly finer grain and effective film speed, contrast control and higher acutance. **Never dilute UFG that has had replenisher added to it or has been used in stock form.** In diluted form you **must use constant agitation**. If you do not, your negatives will be too soft and thin. As a guide, dilute UFG 1:5 and multiply the times shown on the chart by 2-1/2 or 3 times. **And don't forget - constant agitation.** For those who wish to develop for longer time, but do not wish to dilute, add 1 oz. of sodium bisulfite per gallon of developer and triple the development time shown on the chart. If you wish to replenish this solution, you may do so by adding 2 oz. sodium bisulfite per gallon of replenisher. Using sodium bisulfite makes UFG reusable and is not in the category of a one-shot developer as when dilution is used. Sodium bisulfite does not affect the quality, but care must be exercised if film speed is important, as the speed will be slightly affected.

Agitation: For 35mm and 120 roll films, tanks are preferred that can be inverted during agitation. Immediately after immersing films, agitate for the first 15 seconds; thereafter, agitate for 5 seconds at the **End** of each 30 second interval. Our method is 3 gentle inversions while rotating counter clockwise during each 5 second interval, followed by putting the tank down with a gentle tap at the end of each 5 second interval to dislodge any air bubbles. If a multiple reel tank is used to develop just one roll of film, insert empty reels to fill the tank in order to avoid too violent agitation.

Short Stop: A short-stop is not recommended except in cases where the temperature exceeds 80°. If temperatures over 80° are used, a hardening stop bath is advised; use (1) teaspoon of sodium bisulfite and (1) teaspoon of potassium chromealum per quart of water. Use once and discard. In lieu of the short-stop, a brief water rinse of 30 seconds to 1 minute should be used while agitating gently.

Fixing Film: Use a rapid hardening fixer. Fix for twice the clearing time. Do not overfix as delicate half tones may be destroyed. If your fixer is not fresh, fogged or stained film may result.

Storage: If UFG is stored properly, in full or covered containers, away from excessive heat, it will last approximately one year. Where possible, store UFG in the cooling chamber (not freezer) of your refrigerator. Filled sheet film tanks should be covered with floating lids or with air-tight plastic such as Saran Wrap.

Replenishment: Although development may be carried out in UFG without replenishment, it is not generally recommended. If you are developing in this manner, then add 10% to the developing time after your 2nd roll and limit to 25 rolls per quart. Replenishment is definitely recommended, if UFG is not used with the "dilution and discard" method. The average rate of replenishment is at the rate of 1/2 oz. per 80 square inches of developed film - this means (1) roll of 120 or 35mm, 36 exp. (4) sheets of 4x5 or (1) 8x10. Add the replenisher to the "stock" after each batch of film and stir well. Replenisher may be added, until the amount of replenisher added equals the amount of the original "stock" UFG. Properly replenished it will develop at least 60 rolls of film per quart. Replenishment is affected by types of emulsion, storage conditions, over exposures, contamination, etc; therefore we can only give you a guide.

Washing - Drying: Washing is preferably done in one of the high speed units such as the Wat-Air which clears film in 3-5 minutes. Following the was, immerse the film in a good wetting agent for 30 seconds using very gentle agitation; remove and hang to dry. Keep a viscose photo sponge in your wetting agent, squeeze it out and gently wipe your film down once on each side. Allow the film to dry in a dust-free area and at a temperature as close to the processing temperature as possible. Use no heat or fan.

Film Speed: The recommended E.I. (exposure index) listed in this bulletin may be above or below that listed by the film manufacturer, but has been determined by Ethol to give the best exposure index to arrive at the optimum negative with proper development in UFG. This does not mean that you cannot or must not use the film manufacturer's rated index. If you prefer lower rated indices, simply reduce the development time listed in the chart by 10-20% as a starting point.

Ethol UFG film developer

Ethol UFG

Film	Dev	ASA	35mm	Roll	Sheet	Temp °C	Temp °F
APX 100	UFG	160	5	4.75	5	21	69.8
BPF/BRF 200	UFG	200	8.25	8.25	8.25	20	68
Delta 100 Pro	UFG	100	5.5	5.5	5.5	21	69.8
Efke KB25/R25	UFG	40	1.5	1.5		21	69.8
Efke KB50/R50	UFG	64	2	2		21	69.8
Efke KB100/PL100	UFG	200	3.5	3.5	3.5	21	69.8
Ektapan	UFG	100			5.75	21	69.8
FP4+	UFG	200		5.5		21	69.8
FP4+	UFG	250	7.25		7	21	69.8
HP5+	UFG	400			6	21	69.8
HP5+	UFG	500	4.5	6.5		21	69.8
HP5+	UFG	800	5.25			21	69.8
Neopan 400	UFG	640	5	5		21	69.8
Neopan 400	UFG	1000	5.5	5.5		21	69.8
Neopan 1600	UFG	1600	4			21	69.8
Neopan 1600	UFG	2400	5			21	69.8
Pan F+	UFG	50	5	3.5		21	69.8
Plus-X [PX]	UFG	125	3	2.25		21	69.8
Plus-X [PX]	UFG	160			4	21	69.8
Plus-X [PX]	UFG	250	4			21	69.8
Plus-X [PX]	UFG	250		5		21	69.8
Recording Film	UFG	4000	10.5			21	69.8
TMax 100 [TMX]	UFG	80		4.5		21	69.8
TMax 100 [TMX]	UFG	100	6			21	69.8
TMax 100 [TMX]	UFG	160		5.75		21	69.8
TMax 100 [TMX]	UFG	320	9.5		6.25	21	69.8
TMax 400	UFG	200	3.75			21	69.8
TMax 400	UFG	400		3.75		21	69.8
TMax 400	UFG	640			3.5	21	69.8
TMax 400	UFG	800		5		21	69.8
TMax 400	UFG	1000	7.25			21	69.8
TMax P3200 [TMZ]	UFG	1600	5.5			21	69.8
TMax P3200 [TMZ]	UFG	3200	7.5			21	69.8
TMax P3200 [TMZ]	UFG	6400	10.5			21	69.8
Tri-X Pan [TX]	UFG	400	3	3.5		21	69.8
Tri-X Pan [TX]	UFG	650		4		21	69.8
Tri-X Pan [TX]	UFG	1280	5.25	5.25		21	69.8
Tri-X Pan Pro [TXP/TXT]	UFG	500			3.25	21	69.8
Tri-X Pan Pro [TXP/TXT]	UFG	800		5		21	69.8

Ethol T.E.C. film developer

Concentrate or 2-Solution

Description: T.E.C. is a compensating developer, offering maximum shadow detail, economy, developing control, and acutance. T.E.C. is panthermic, and may safely be used at temperatures from 60°F to 80°F.

General Information: T.E.C. is available as a liquid concentrate. For use it is diluted 1 part developer to 15 parts water; use once and discard. It is recommended that a temperature of 70° to 75°F be used.

2-Solution T.E.C.: T.E.C. is also available in 2 solution powder form. To use, dissolve Can “A” in 1/2 gallon of water and can “B” in separate containers. Plastic juice containers will do. You may use any two types of containers for processing - plastic, Kinderman or Nikor. Fill one container with the “A” solution and the other with the “B” solution, adjust temperatures to 75°F. Place the film reels into “A” and then into “B” for the recommended times **without any rinse between**. Follow with water rinse and rapid fixer. For longest life and quality, use distilled water for the “stock” solution. Normal color of solution after dissolving powders is clear to a weak tea color. Occasionally, however, the color may be somewhat darker, which may be due to the variables in raw materials. 2-Solution T.E.C. is extremely long lasting when using the stock form (A&B separately), developing up to 200 rolls of 35mm 36 exp. film, or up to 120 rolls of 120 - 12 exp. film. During the useful developing life of this product the solutions will become darker in color. This will not affect the high quality of the negatives. The longer life of 2-Solution T.E.C. is normal, due to the separation of the chemicals.

Note: For economy and negative control: “A” is the developing agent, which will help control your density. “B” is the activator for controlling contrast. Times may be changed in “A” or “B” or both in order to achieve the desired control. If you desire to develop by inspection, start your inspection as you are ready to remove the film from the “A” bath.

For more economy in the one-shot method, you may take **unused fresh stock solutions** of the 2 bath method (solution A&B) and mix 1 oz. of A solution and 1 oz of B solution with 14 oz. water; to make a total of 16 oz. solution; use once and discard; use times are shown for the dilution discard method.

- The recommended E.I. (exposure index) listed in this bulletin may be above or below that listed by the film manufacturer, but has been determined by us to be the best exposure index to arrive at the optimum negative with proper development in T.E.C.
- Water quality is important for quality processing. It should be as pure as possible. If your water supply is not free of minerals and foreign matter, the use of distilled water or bottled water is recommended.
- If possible, do not pour solutions in and out of daylight loading tanks. Preferably, fill the tank with developer and in the dark, drop the loaded reel into it. Following development, lift the reel out, into the next solution. This contributes to more accurate timing and more uniform development of the negatives.
- High speed films will achieve maximum definition when developed in T.E.C., but will have slightly more grain than if developed in a fine grain developer. There is NO film speed loss to high speed films when developed in T.E.C. (Tri-X 35mm exposed at ASA-50 to ASA 2400 on the same strip of film, renders printable negatives from each frame).

Good Housekeeping: Cleanliness is a must. T.E.C. as well as other film developers can be contaminated by foreign matter. Tanks and reels should be cleaned periodically; a tooth brush makes an excellent tool for cleaning reels. Always dry tanks and reels immediately after use, with a clean, lint-free towel.

Storage: Liquid T.E.C. will keep almost indefinitely in the original sealed container. After opening a bottle and using part, it is recommended that the remainder be placed in a refrigerator, either in the same bottle or in new, unused, 1 oz. amber bottles. Do Not Freeze. Contrary to the 2-Solution T.E.C., the liquid concentrate is oxidized if it turns black. **Do Not Use The Liquid Concentrate If It Has Turned Brown Or Reddish In Color.**

Agitation: For 35mm and 120 roll films, tanks that can be inverted during agitation are preferred. Immediately after immersing film, agitate for the first 15 seconds, then agitate 5 seconds at the end of each 30 seconds. Our method is 3 gentle inversions during the 5 seconds with a gentle rotation of the tank followed by putting the tank down with a gentle tap at the end of each interval to dislodge any air bubbles that may have formed. Where very deep roll film tanks are used, it is suggested reels be placed on a long wire and the agitation periods. Do Not Lift Out Of Solutions.
Developing in a tray or dish, with constant agitation, will reduce developing time by approximately 20%.

Short Stop: A short-stop is **not recommended** except in cases where the temperate exceeds 75°F. If temperatures over 75°F are encountered, a hardening stop bath is advised. Use 1 tsp. sodium bisulfite and 1 tsp. potassium chromealum per quart of water. Use once and discard. In lieu of the short stop, a brief water rinse of 20 to 30 seconds may be used, if desired.

Fixing The Film: Use a rapid hardening fixer. Fix for twice the clearing time. Thick emulsion or high speed films will require about 1/3 longer to fix than the slower, thin emulsion films. Do no over-fix...delicate half-tones will be destroyed and grain clumping will result. If your fixer is not fresh, fogged or stained film may be expected.

Washing - Drying: Washing is preferably done in a high speed unit such as the Wat-Air which cleans film in 3-5 minutes. Following the wash, immerse the film in a good wetting agent (about 3-4 droplets of wetting agent to one quart of water; distilled if possible) while gently agitating for abut 30 seconds. Remove film to dry. Keep a good photo sponge in the wetting agent at all times; squeeze it out and gently wipe your film down once on each side. Allow the film to dry in a dust free area and at a temperature as close as possible to the processing temperature used. Do no use a fan or heat.

Temperature: The importance of accurate temperature uniformity throughout the developing procedure cannot be overemphasized. Inaccuracies in thermometers are very common, and can play havoc with negative contrast. Check your thermometer often. Keep developer, fix, wash and drying at the same temperature. Avoid high temperature processing of high speed films; chemical fog may result.

Time & Temperature Table: Photography is not an exact science, and variables are encountered with each photographer and his equipment. The following tables are furnished as a guide; a Starting Point so that you may achieve the optimum negative quality. The normal speed index (E.I. rating for the film processed in Ethol T.E.C.) may be higher or lower than the official ASA rating. This is the optimum rating for Ethol chemistry, and should not be confused with “pushed index”. Using the double condenser enlarger, the E.I.s given in the table should give optimum print quality when the negatives are developed as instructed. Negatives that are to be enlarged with a diffusion type of enlarger will require about 20% longer developing times, as they require a higher gamma. **There is no single correct developing time to give optimum results under all conditions.**

Ethol T.E.C. film developer

Ethol T.E.C.

Film	Dev	ASA	35mm	Roll	Sheet	Temp °C	Temp °F
APX 100	TEC (1+15)	160	13.25		13.25	21	69.8
APX 100	TEC (1+15)	250	17.75	13.25	17.75	21	69.8
Delta 100 Pro	TEC (1+15)	100	15	15	15	21	69.8
Efke KB25/R25	TEC (1+15)	100	7	7		21	69.8
Efke KB50/R50	TEC (1+15)	160	7	7		21	69.8
Efke KB100/PL100	TEC (1+15)	400	10	10	10	21	69.8
Ektapan	TEC (1+15)	100			14.5	21	69.8
FP4+	TEC (1+15)	160			18	21	69.8
FP4+	TEC (1+15)	200	14	10.5		21	69.8
HP5+	TEC (1+15)	400		16		21	69.8
HP5+	TEC (1+15)	640	14.25		16.5	21	69.8
HP5+	TEC (1+15)	800	17.75			21	69.8
Neopan 400	TEC (1+15)	500	14	14		21	69.8
Neopan 400	TEC (1+15)	1000	18	18		21	69.8
Neopan 1600	TEC (1+15)	1600	24			21	69.8
Neopan 1600	TEC (1+15)	2400	27			21	69.8
Pan F+	TEC (1+15)	50		6		21	69.8
Pan F+	TEC (1+15)	64	6.5			21	69.8
Plus-X [PX]	TEC (1+15)	250			12	21	69.8
Plus-X [PX]	TEC (1+15)	320		9		21	69.8
Plus-X [PX]	TEC (1+15)	400	12			21	69.8
TMax 100 [TMX]	TEC (1+15)	80			20	21	69.8
TMax 100 [TMX]	TEC (1+15)	100	14.5			21	69.8
TMax 100 [TMX]	TEC (1+15)	160	17		24	21	69.8
TMax 100 [TMX]	TEC (1+15)	200		14		21	69.8
TMax 100 [TMX]	TEC (1+15)	320		17		21	69.8
TMax 400	TEC (1+15)	320	15.25			21	69.8
TMax 400	TEC (1+15)	400		14.25	18.5	21	69.8
TMax 400	TEC (1+15)	640	18.5		21.75	21	69.8
TMax 400	TEC (1+15)	800		17		21	69.8
TMax P3200 [TMZ]	TEC (1+15)	3200	17.5			21	69.8
TMax P3200 [TMZ]	TEC (1+15)	6400	22.75			21	69.8
Tri-X Pan [TX]	TEC (1+15)	800		13		21	69.8
Tri-X Pan [TX]	TEC (1+15)	1000	12			21	69.8
Tri-X Pan Pro [TXP/TXT]	TEC (1+15)	400		14.5	9.75	21	69.8
Recording Film	TEC (1+30)	100	5.5			21	69.8

Ethol LPD "Lasting Paper Developer"

Description: LPD is a simple, easy to use paper developer that offers long life, economy and tone control. Use it in the same way that you are using your present developer and notice the way your prints take on new "life". Notice that brilliant blacks, the pure sparkling whites, and the number of prints that can be run in a tray of developer. Notice its non-staining characteristics and the lack of skin irritation. And notice too, it is available in a choice of powder or liquid.

LPD is a neutral tone, long scale, normal contrast paper developer that may be used in the usual dilute-discard method, or may be replenished for extended life by following the easy picture directions on the back of this sheet.

LPD offers great print capacity, i.e., a tray of 1/2 gallon of working solution will process a minimum of 360 - 8x10 single weight prints, when properly replenished. Uniform quality and tone is maintained throughout the useful life of the developer. No longer is it necessary to throw out good developer just because a few prints had been run in it. Simply replenish per the simple directions.

LPD in powder or in liquid concentrate may vary in color from white or clear to slightly pink. This does not indicate any deterioration in the product, but is due only to variables in raw materials. In the event of extreme extended use, LPD may become black, but will still produce prints of high quality.

LPD does not stain and irritate the skin, as is characteristic of so many developers. Most developers contain Metol, which is a toxic developing agent. LPD contains no Metol. Instead, Phenidone has been used. This developing agent is non-toxic and has made it possible for many photographers to return to the lab without frear of skin problems.

LPD contains Hydroquinone, which is a regenerating chemical that acts very rapidly on the Phenidone. When LPD is used as directed, full strength of the solution is maintained until all the working and replenishment solution has been used.

LPD will amaze you with its printing versatility; it may be used with all types of printing papers. Tones may be varied from the very cold to very warm, just by selection of the paper and the dilution of the "stock" developer.

Anything we may say about LPD would be an understatement that sounded like an exaggerated claim. Your own tests will confirm them and convince you "there's nothing like LPD", not to mention its great shelf life. Stored at reasonable room temperature, in a tightly capped bottle, LPD stock solution will last well over a year.

Mixing: LPD is a single-mix powder which dissolves easily in tap water at 80 to 100°F. The contents of the can should be dissolved in 3/4 the final volume of water, and then cold water added to bring the solution up to the indicated amount. This becomes the "Stock" solution. When diluting the developer be sure to stir well to obtain a more uniform solution. **LPD Liquid Concentrate** is also available. This is already mixed and is a "Stock" solution. Dilute 1:4 for neutral tones, 1:8 for warm tones, 1:2 for cold tones.

Normal Use: To make a "Working" solution from powder, dilute the "Stock" solution 1:2 with water, and develop the prints for 1-1/2 to 2 minutes at 70°F. This dilution will produce a neutral tone.

Tone Control: LPD offers the unique ability of print tone control. Where most developers change in contrast as they are diluted. LPD maintains a uniform contrast, but changes tone, i.e., a dilution of 1:4 produces warm tones; 1:2 neutral tones; and 1:1, or full strength, produces colder tones.

The preceding applies to dilutions made from the stock solution prepared from powdered LPD. When using the liquid concentrate, the dilutions are doubled; 1:2 for cold tones, 1:4 for neutral tones, and up to 1:8 for warm tones.

Very wide tone latitude is obtained by the choice of paper, coupled wit the appropriate dilution of the developer. Fast Bromide papers will give a very blue-black tone, while the chloro-bromide papers would naturally produce warmer tones. Prints should be exposed sufficiently to give good blacks. LPD does not sacrifice emulsion speed, so the normal exposure should be correct.

Film Development: LPD may be used for the development of certain films as well as paper. It may be used to process lantern slides, micro films, and certain high contrast films, such as Kodak High Speed Duplicating Film 2575, (dilute 1:1 and develop for one minute at 70°F).

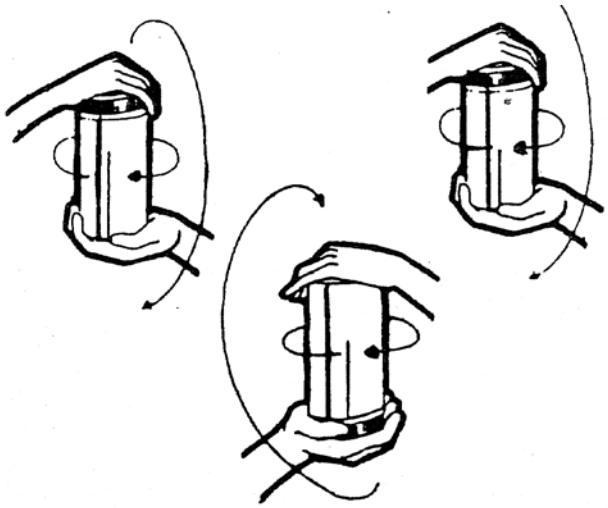
For the arty individual who wishes grainy, but sharp negatives, try developing Ilford HP-5 exposed at an index of 2000 for 1-1/2 min. at 70°F.

Short-Stop and Fix: Even though LPD has a minimum tendency to stain, i is advisable to use a short stop. Any regular stop-bath may be used and any of the fixers; however, if a rapid-fix is used, care should be taken not to leave the prints in too long, or bleaching will result and tones will be sacrificed.

Ethol "Agitated Over Agitation?"

If you have film processing problems, the answer may lie in the way you agitate your film during development. If you have "streaks", "mottling", or irregular densities in your negatives, this is definitely the reason. We feel so strongly about the importance of agitation that we have added several new points to our previous recommendations on agitation.

UNIFORM NEGATIVE: To achieve a uniform negative, we must have uniform development. This is achieved by creating a "flow pattern" of three (3) or more directions of developer across the negative AND with the proper frequency. The following illustrations show our recommended procedures for agitation hand tanks and sheet film hangers. In each case, use mild constant agitation for the first 15 seconds, wait 30 seconds, then agitate for 5 seconds, wait 30 seconds, agitate 5 seconds, etc...AND keep your eyes on the TIMER at all times.



PREFERRED INVERSION-ROTATION METHOD: Tanks are rotated "counter-clockwise" at the same time they are inverted. If you are agitating properly, you are inverting and righting the tank 3 times during the 5 second agitation period. (This means 9 times during the first 15 seconds.) Note: As each cycle of agitation is completed, set the tank down with a gentle "tap" to dislodge any air bubbles.

ALTERNATE ROLL-AWAY METHOD: If you are processing 4, 6, or 8 rolls of film in a multiple reel tank, it is very difficult to control agitation in the preferred method described above. You may then use the Roll-Away method. In this, you fill your tank, cover with the lid and lay tank on its side, immediately beginning to roll the tank back and forth across your work bench for the first 15 seconds. The speed is similar to the above - 3 "ups and backs" within each 5 second interval. Then rest for 30 seconds, and roll-away again for 10 seconds each 30 seconds, until development is completed. (Note: 10 seconds each 30 seconds with this method.) Tap gently 2 or 3 times after each 10 second agitation period to dislodge any air bubbles.

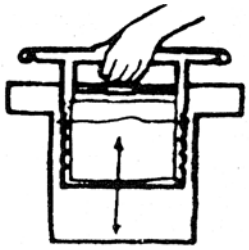
DILUTED DEVELOPERS AND CONSTANT AGITATION: Many people prefer a stock-type developer, such as Ethol UFG, but like to use it in diluted form in order to lengthen their development time. (Time is increased by 2-1/2 - 3 times normal.) This type of developer is not to be confused with a concentrated type of developer (such as Ethol T.E.C.) which MUST BE DILUTED before use. If you dilute UFG (1:5) YOU MUST AGITATE CONSTANTLY. If you do no wish to, or cannot use our inversion-rotation method, you may take your diluted UFG, fill the tank with one-half (1/2) the amount of solution the tank normally holds, drop your film in the tank, cover the lid and lay the tank on its side, and start rolling back and forth at the speed recommended above in the Roll-Away method. This you do for the ENTIRE LENGTH OF DEVELOPMENT TIME for the particular film. If you do not agitate constantly, you will find you have "thin" negatives.

TEMPERATURE CONTROL: If you are concerned about constant temperature, which varies from darkroom to darkroom, and with the amount of heat generated in rolling the tank to and fro, we suggest you create a water jacket in a 16x20 tray, and roll your tank in that tray.

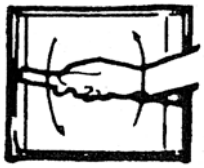
120 ROLL FILM AND DENSE EDGES: If you find you are having this problem, not only must you check your agitation method, but also check to see if you are winding your film on your reel too tightly, which prevents the developer from working on both sides of the film equally well.

LIFTING RODS: In using lifting rods to process in a deep tank or in a multiple reel tank, gently lift the rod up and down while turning the rod counter-clockwise. Do not lift clear or the solution.

SHEET FILM HANGERS:

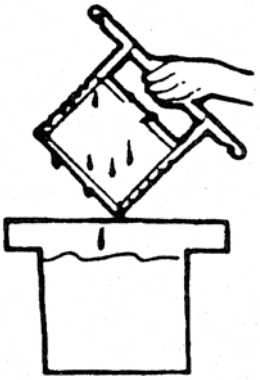


1. "Lifting"
Up and Down - 5 sec.



2. "Twisting"
Side to Side - 5 sec.

3. "Rocking"
End to End - 5 sec.



4. Lift Out
Drain - 2 sec.

Sheet film hangers are agitated constantly the first 15 seconds as follows: 5 sec. of step #1, 5 sec. of step #2, 5 sec. of step #3. Now remove from the tank (step 4) and drain from the corner for 2 seconds and put the film back in the tank for a wait of 30 seconds. Repeat step #1 for 5 sec., wait 30 seconds, repeat step #2 for 5 sec., wait 30 seconds, repeat step #3 for 5 sec., wait 30 seconds, repeat step #4 for 2 sec., and return the film to the tank for a wait of 30 seconds. Repeat steps 1, 2, 3, and 4 until development is completed.

REMEMBER: Photography is not an exact science. Whatever you do correctly or incorrectly will affect your result. If that result is one you do not like, these bulletins are prepared to aid you as a starting point only. If you wish to amend these procedure suggestions, and it gives you the result for which you had hoped, by all means use it.