Ilford Films

Film	Time 70° F	Time 80° F
Ilford FP4 Plus(EI 80-100)	10 minutes	
Ilford HP5 Plus (EI 320-400)	13 minutes	8 minutes
Ilford Pan F Plus (EI 32)	9 minutes	
Ilford Delta 100 (EI 80)	11 minutes	
Ilford Delta 400 (EI 260-320)	12 minutes	

Kodak Film

Film	Time at 70° F	Time at 80° F
Kodak Tri-X (EI 260)	14 minutes	
Kodak T-Max 100 (EI 80-100)	12 minutes	9 minutes
Kodak T-Max 400 (EI400)	15 minutes	

Notes: Kodak T-Max 100 and T-Max 400 are extremely sensitive to development time and temperature. Carefully control the development time and use a temperature controlled water bath, if possible.

Kodak T-Max 100 appears to have a large amount of anti-halation dye. This dye must be removed or shadow separation and image clarity will suffer. Kodak recommends that the developed and fixed negatives receive an additional bath in fresh fixer to remove any anti-halation dye, our TF-4 fixer will remove this dye.

For T-Max P3200, try EI of 3200 and PMK for 10-12 min. at 80° F

Agfa Films

Film	Time at 70° F
Agfapan 25 (EI 16)	11 Minutes
Agfapan 100 (EI 80)	13 Minutes
Agfapan 400 (EI 200)	16 Minutes

Notes: For Agfapan 100 roll film, try EI of 100 and 11 minutes. For Fuji Neopan 400, use 12 minutes for 35 mm, 13 minutes for 120 film.

For more information on Pyro we offer Gordon Hutchings book, "The Book of Pyro", catalog number. 08-0080.

FOR ANSWERS TO QUESTIONS ON THE USE OF "PMK" PYRO FILM DEVELOPER, PLEASE CALL US AT 406-754-2891.

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THE PMK PYRO FILM DEVELOPER

CAT. NUMBER 01-5045 TO MAKE 25 LITERS OF WORKING SOLUTION

The PMK formula is designed as a universal developer for a wide variety of modern emulsions used under diverse conditions. PMK stands for "Pyro-Metol-Kodalk" Kodak has changed the name KODALK to "Balanced Alkali"; this is their proprietary name for sodium metaborate. The formula is constituted to achieve the best overall results in consideration of the following technical criteria: sharpness, maximum image stain, minimum general stain, edge effects, film speed, flexibility for zone system Plus and Minus development, stability, consistency, convenience of use and long shelf-life.

FOR YOUR CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read the warnings listed here. Always use rubber gloves and dust mask when using chemicals.

METOL: Some individuals become sensitized (develop allergic symptoms or rashes) when using metol. If this should occur, discontinue use and consult a physician.

PYROGALLOL: Pyro is quite toxic and is readily absorbed through the lungs, skin and mouth. Pyro is also a phenol and has the potential to cause skin burns. To be on the safe side please use rubber gloves and keep your work area clean with lots of soap and water. Brief contact with the skin will cause a darkening which is not a chemical burn. Prolonged skin contact will cause a chemical burn which closely resembles a heat burn. Pyro is also very dusty. Work in a well ventilated area. Do not inhale its dust. Keep containers tightly closed and away from light.

KEEP AWAY FROM CHILDREN

FIRST AID: If contact is made, flush with water. If extensive contact is made or if in eyes, consult a physician. If inhaled or swallowed, get medical attention at once.

IF FOR ANY REASON YOU DO NOT WISH TO ASSUME ALL RISKS IN USING THESE CHEMICALS, PLEASE RETURN FOR A CREDIT.

Please consult with local sewer and water authorities regarding the proper disposal of darkroom chemicals in your area.

PMK STOCK SOLUTIONS

A Solution	250 ml	B Solution	500 ml
Distilled Water 75°F	200 ml	Distilled Water 75°F	350 ml
Metol	2.5 gr.	Sodium Metaborate	150 gr.
Sodium Bisulfite	5.0 gr.	Distilled water to Make	500 ml
Pyrogallol	25.0 gr.		
Distilled water to make	250 ml		

MIXING THE STOCK SOLUTIONS

STOCK SOLUTION A: Distilled water is recommended, but filtered tap water can be used. Take a small pinch of sodium bisulfite and add it to the water. Add the metol to the "A" solution and stir until it is dissolved completely. Add the remaining sodium bisulfite and stir until dissolved. Add the pyro to the stock solution outside or under a ventilating hood. Stir until pyro is dissolved completely.

STOCK SOLUTION B: Distilled water is a **MUST** for solution "B". This solution is highly concentrated and a considerable quantity of the sodium metaborate may precipitate if the water is not pure. Dissolve the chemical in distilled water. Any residual amount of this chemical will dissolve by itself after 24 hours. The small amount of residual left will not affect the solution activity even if used immediately.

The shelf life of the stock solution is indefinite. Partially filled and stoppered bottles will last for years. Glass bottles are preferred for the storage of developer solutions, but plastic is also acceptable.

Clear bottles are fine for PMK if stock solution "A" is kept out of strong light. After a week or two, the color of stock solution "A" will turn a pale yellow color. This is the equilibrium point and no further change will occur.

WORKING SOLUTION OF PMK

1 Part A + 2 Parts B + 100 Parts of water

Example: 10ml A + 20 ml B + 1000 ml of water make approximately one liter of working solution. Measure the quantity of water and add the A and B stock solutions. It does not matter whether A or B is added first.
Note: When PMK is mixed together, the solution will immediately proceed through color changes from gray-green to pale amber. This is an important visual check of solution activity. If there is no color change, something is wrong. Recheck your stock solution for correct formulation. **Use immediately.**

CAPACITY OF PMK

PMK is a one-shot developer. Because it is so dilute, a minimum of 300 ml of developer per 80 square inches of film (one roll of 36 exposure 35 mm film, or four 4 by 5 negatives) must be present in the tank or tray.

Inconsistencies can result by varying the ratio of film to quantity of developer used. Best results will be obtained by keeping the amount of PMK per roll consistent.

AGITATION PROCEDURE

If using tank developing, rap the tank sharply on a counter 3-5 times immediately after filling with developer to dislodge any air bubbles. Agitate vigorously with two complete inversions every 15 seconds. Invert the tank in a different direction each time, and then leave idle until until next next cycle.

If using trays use a tray one size larger than the film. Begin agitation immediately and vigorously. The film should make a “clack” sound against the tray. Some developer should spill into the sink. **Wear gloves**. Tip trays once or twice every 15 seconds. Tip from each of the sides in rotation for successive cycles. Allow the tray to sit idle between each cycle.

FILM DEVELOPMENT TEMPERATURE

The conventional temperature for film development is 68°F (20° C) or 70°F. During the summer month in many parts of the country, cold tap water is often much warmer than 70°F. To bring this temperature down with ice cubes is inconvenient, to say the least. For PMK each degree of increased developer temperature, decrease the development time by 4%. Do not hesitate to use the higher temperatures. With appropriate reduction in development time, no loss of quality in the negative will result.

STOP AND FIXING BATHS

A plain water stop bath is excellent for all normal films and developers. Use a large volume of water and agitate roll and sheet film continuously. Use of an acid stop bath will strip the pyro stain.

We recommend using our TF-4 non-acidic fixer (cat. no. 03-0141), since fixers with hardening agent will decrease the image stain, therefore, the use of non-hardening fixers is necessary. Do not use TF-4 with an acid stop bath. Do not exceed manufacturer's recommended fixing time.

PYRO AFTER BATH

Place all negatives direct from fixer, into the used developer for two minutes. Agitate every 30 seconds. The alkali after bath induces the formation of stain in the developed negative. An alternative alkaline after bath can be used if desired. The use of 5 grams of sodium metaborate per liter of water is the alternative.

FINAL WASH

Wash film in running water for 20-30 minutes. Wash all films for at least 20 minutes. The image stain intensifies during the wash cycle.

DEVELOPMENT TIMES

These are starting times. Please test before developing non-replacable films.