

01-0210 TO MAKE 1 LITER
01-0211 TO MAKE 2 LITERS

Roll number 4-8 (or 4-18 for the 2 liter kit): Remove and discard 100 ml of the active developer for each roll of film developed and replace it with 100 ml of the “replenisher” (the fresh working solution that was set aside). Use the “Subsequent roll development times” for all rolls of film.

USING THE DEVELOPER

A typical developing sequence at 20°C/68°F is:

Develop: (See above)
Stop: 30 seconds
Fix: 2-4 minutes with Formulary TF-4 Rapid Fix (Cat. No. 03-0141)
Wash: 30 seconds
Clear: 2 minutes using Formulary Hypo Clear (Cat. No. 03-0165).
Wash: 5 minutes in running water.



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F PHOTOGRAPHERS' FORMULARY

FORMULARY FILM DEVELOPER 12

Film Developer 12, equivalent to Edwal 12, is an excellent, fine-grain film developer that gives full emulsion speed, a full contrast range and superb sharpness. The developer contains p-phenylenediamine (paraphenylenediamine), glycin, and metol as the active agents. The p-phenylenediamine produces the extremely fine grain characteristic of this developer, while the glycin and metol provide the speed and contrast.

Developer 12 is not a compensating developer. The negatives are brilliant rather than flat in appearance. Developer 12 reproduces flatter scenes better than other film developers and, as a result, it is an excellent developer for copying or reproducing negatives.

CHEMICALS CONTAINED IN THIS KIT

Your kit will contain the following chemicals:

Kit Size

Chemical	1-liter	2-liter
Metol	6 g	12 g
Sodium sulfite	90 g	180 g
p-phenylenediamine	10 g	20 g
Glycin	5 g	10 g

CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read the warning on each package. This kit contains two chemicals that need special attention: p-phenylenediamine and metol.

p-Phenylenediamine is very toxic and has been reported to cause cancer in laboratory animals. Use extreme care with this chemical. Wear rubber gloves when working with this compound or its solutions.

If spillage on the skin should occur, wash the area thoroughly with soap and water.

Clean the work area very carefully using a 1% solution of hydrochloric acid (about 3 ml of concentrated acid per 100 ml of water).

The hydrochloric acid converts the p-phenylenediamine to a water soluble salt making the compound easier to remove.

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

The user assumes all risks upon accepting these chemicals. IF FOR ANY REASON YOU DO NOT WISH TO ASSUME ALL RISKS, PLEASE RETURN THE CHEMICALS WITHIN 30 DAYS FOR A FULL REFUND.

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

MIXING THE DEVELOPER

We recommend you wear a dust mask, splash goggles, rubber gloves and a rubber apron anytime you are mixing dry chemicals.

To mix the working solution, you will need a 1- or 2-liter storage container, a mixing bowl, and a graduated cylinder or other volume measuring device. A plastic spoon and a funnel will also be useful.

Working Solution

Kit Size

Chemical	1-liter	2-liter
Distilled water (125° F/52° C)	750 ml	1500 ml
Metol	6 g	12 g
Sodium sulfite	90 g	180 g
p-Phenylenediamine	10 g	20 g
Glycin	5 g	10 g
Water (68° F/20° C) to make	1000 ml	2000 ml

Use distilled water and degas it by boiling for three minutes and let cool to 125° F. This will minimize the initial oxidation of the metol.

Place the warm water in a mixing bowl and add a pinch of sodium sulfite. Like boiling, a small amount of sulfite will minimize the initial oxidation of the metol. Use only a small amount of sulfite; larger amounts will prevent the metol from dissolving. Add the metol and stir the mixture to dissolve the solid. After the metol has dissolved, add the sodium sulfite. Again, stir the solution to dissolve the solid.

The p-phenylenediamine is added next followed by the glycin. Be sure each solid is dissolved before the next one is added to the mixture. After all of the solids have been dissolved, add sufficient water to bring the final volume up to 1000 (or 2000) ml, then transfer it to its storage container. Be sure to clean all mixing utensils thoroughly.

LIFE OF THE WORKING SOLUTION

The shelf life of the working solution is about 6 months in a full, tightly-capped bottle.

CAPACITY AND DEVELOPMENT TIMES

The capacity of the developer depends upon the method of use. The most economical method for use is a replenishment procedure, the description for which is given below.

The development times also depend upon the method by which the developer is used. The fresh developer is more active than the partially spent developer. When using replenishment, a shorter development time is used for the first roll of film, but all subsequent rolls are developed using a longer time.

The development times given below are only suggested starting values. Your exact time may vary depending upon your agitation technique and contrast requirements.

Working Solution

Development Time

Film Type	First Roll	Subsequent Rolls
Plus X	5-7 minutes	7-9 minutes
Tri X	6-9 minutes	8-11 minutes
HP 4	6-9 minutes	8-11 minutes

Using a 500 ml stainless steel developing tank, the following replenishment procedure should be followed.

Use 500 ml of the working solution as the active developer and set aside 500 (or 1500) ml of the working solution as the replenisher. Do not mix the active working solution and the replenisher except as described below.

Roll number 1-3: Use the "First Roll" recommended development time for the initial roll of film, and the "Subsequent Roll" time for the next two rolls. No replenishment is necessary.