

## ROLL FILM

Develop (20°C/68°F)	8 minutes
Stop	30 seconds
Fix	5-10 minutes in a fixer such as Formulary Fixer 24 (catalog no. 03-0010) (do not use rapid fix)
Wash	30 seconds
Clear	2 minutes (Use Formulary Hypo Clear 03-0165)
Wash	5 minutes in running water

Agitate roll film for the first minute and for 15 seconds every 30 seconds thereafter.

## SHEET FILM

Presoak in water	2 minutes
Develop (20°C/68°F)	7 minutes
Stop	30 seconds
Fix	5-10 minutes in a fixer such as Formulary Fixer 24 (catalog no. 03-0010) (do not use rapid fix)
Wash	30 seconds
Clear	2 minutes (Use Formulary Hypo Clear 03-0165)
Wash	5 minutes in running water

Develop in a tray with constant but gentle agitation.

Consult local sewer and water authorities regarding disposal of darkroom chemicals.



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## PHOTOGRAPHERS' FORMULARY

### JOHN WIMBERLEY DEVELOPER NUMBER 2, VERSION D (WD2D)

WD2D is a modern pyrogallol-metol film developer formulated by John Wimberley. His article on this formula has been published in the October 1977 issue of PETERSEN'S PHOTOGRAPHIC.

Wimberley's WD2D is unusual in two respects. First, unlike most pyrogallol developers, which lose about one f-stop, WD2D produces full film speed. Second, contrast control is achieved by varying the proportions of the two stock solutions used to make the working solution. Almost all other film developers control contrast by varying development time or by using split development (compensating developers)

### CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read the warnings on each package.

There are two chemicals in Wimberley's WD2D that need special attention: Metol and Pyrogallol.

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

**PYROGALLOL** is a phenol and thus has the potential to cause chemical skin burns. To be on the safe side, use rubber gloves and clean your work area and equipment with lots of water. (Soap and water is best.) If pyrogallol (solid or in solution) should come into contact with your skin, wash the area with water followed by soap and water. Brief skin contact produces a dark stain, which is not a chemical burn. Prolonged skin contact does produce a chemical burn, which closely resembles a heat burn.

PYROGALLOL is also a poison. Do not inhale its dust.

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

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

### MIXING THE STOCK SOLUTIONS

You will need two storage bottles, glass or plastic, each with a capacity of 1/2 liter (or 1 lt.). You will also need a 10-ml, 25-ml, and a 100 ml graduated

cylinder to prepare the 1% benzotriazole solution, to mix the Stock Solution B, and to mix the working solution.

WD2D should be prepared using distilled water.

### STOCK SOLUTION A

CHEMICAL	KIT SIZE	
	1/2 liter	1 liter
Distilled water (38°C/100°F)	400 ml	800 ml
Metol	1.5 g	3.0 g
Sodium bisulfite	5 g	10g
Pyrogallol	15 g	30 g
Distilled water to make	500 ml	1000 ml

Place the warm distilled water in the storage container and add a pinch of sodium bisulfite. A pinch of the bisulfite retards the initial oxidation of the metol, but more will prevent the metol from dissolving. Add the metol then stir until dissolved. Add the sodium bisulfite, which should dissolve rapidly upon stirring. Next add the pure white pyrogallol. It will also dissolve rapidly upon stirring. Finally add distilled water to bring the final volume of the stock solution up to 500 ml (or 1000 ml). The temperature of this final portion of water is not important; however, be sure to stir the final solution to ensure the solution is homogenous.

### STOCK SOLUTION B

To mix stock solution B, you will first need to prepare a 1-% benzotriazole solution. Place 100 ml of warm water in a container and add 1 gram of benzotriazole. Stir until the solid dissolves. You will use only a small portion of this solution. The remainder can be saved or discarded. The benzotriazole is mixed in this manner for accuracy.

CHEMICAL	KIT SIZE	
	1/2 liter	1 liter
Distilled water (38°C/100°F)	400 ml	800 ml
Sodium carbonate, mono.	20 g	40 g
1% benzotriazole solution	2 ml	4 ml
Distilled water to make	500 ml	1000 ml

Place the water in a container; add the sodium carbonate and benzotriazole solution. Stir until the solid goes into solution. Add sufficient water to bring the final volume up to 500 ml (or 1000 ml).

### LIFE OF THE SOLUTIONS

Stock Solution A contains both developers, however since the solution is

slightly acid (due to the sodium bisulfite), it should keep 2-6 months provided that it is stored in a tightly capped container.

Stock Solution B is moderately alkaline. Its life should be in excess of one year.

### MIXING THE WORKING SOLUTIONS

When using Wimberley's WD2D, the proportions of Stock Solutions A and B that are mixed to prepare the working solution control contrast.

The following charts can be used as a starting guide for contrast control.

#### Normal Contrast

	ROLL FILMS	SHEET FILMS
Stock Solution A	20 ml	20 ml
Stock Solution B	20 ml	20 ml
Distilled water	400 ml	300 ml
Total Volume	440 ml	340 ml

#### For Decreased Contrast

	ROLL FILMS	SHEET FILMS
Stock Solution A	20 ml	20 ml
Stock Solution B	18 ml	18 ml
Distilled water	400 ml	300 ml
Total Volume	438 ml	338 ml

#### For Increased Contrast

	ROLL FILMS	SHEET FILMS
Stock Solution A	20 ml	20 ml
Stock Solution B	22 ml	22 ml
Distilled water	400 ml	300 ml
Total Volume	442 ml	342 ml

### USING THE DEVELOPER

With either roll or sheet film, do not use rapid fix. The ammonium thiosulfate in most rapid fixers may cause a green stain to form.

The development times are suggested values only.