WD2D Modified Pyro-Metol Formula and Processing

My pyro formula is a variation on the original Wimberley WD2D formula published in Petersen's Photographic in 1978 and later re-published in Darkroom and Creative Camera Techniques. John Wimberley has recently re-formulated WD2D and sells it exclusively through a popular photo chemical supplier as "WD2D+". It is much more highly concentrated and requires different dilutions and times. At first I used the original formula but later made changes to it by removing the restraining agent (benzotriazole) in solution B. In 2002 when I started working with the 12x20 camera, I increased the amount of sodium carbonate in Part B by 11% from 40 grams to 44.4 grams to make the developer more active. The artar lenses I use with the 12x20 are lower contrast lenses and so the negatives needed a little extra punch. I have since converted to using this new formulation for all formats and films. The formula is as follows:

Solution A	
Distilled Water (at 125 deg. F)	1 liter
Metol	3 grams
Sodium Bisulfite	10 grams
Pyrogallol	30 grams

Solution B	
Distilled Water	1 liter
Sodium Carbonate (monohydrate)	44.4 grams

Development Philosophy

My formula and processing practices do not follow the philosophy of maximum stain/minimum silver. Stain is your friend but it can be your enemy in printing alternative processes. Too much stain can easily extend printing times to an hour which I find unacceptable. For a more comprehensive discussion of the effects of pyro stain in printing alternative processes such as platinum/palladium printing, I refer you to the Appendix D of the second edition of Dick Arentz's book, Platinum & Palladium Printing. It is titled "Pyro and Platinum Printing" and discusses the spectral density effects of pyro stain when using UV light for printing. Dick invited me to author the appendix.

Pyro Stain Color

The color of the stain of a pyro-developed negative is dependent on the alkalai used in Part B or C. Formulas which use sodium carbonate such as ABC and Wimberley will have a yellow-brown stain. Formulas which use sodium metaborate (Kodalk) such as PMK and Rollo Pyro will have a green stain. My experience has been that the yellow-brown stain color tends to fool the human eye as to how much density it will present to UV light. The green stain more closely approximates what the human eye perceives as the density presented to UV light. But I find the green stain very distracting when looking at negatives and prefer a modified Wimberley formula.

Films

I prefer TMAX 400 for my platinum negatives and use it exclusively for 4x5 and 8x10 formats. Its pronounced contrast and beautiful edge effects are a perfect combination for platinum. I have tried Tri-X and found results similar to TMAX but the reciprocity characteristics requiring ever increasing exposure in low light situations make long exposures difficult to manage. Many of the exposures inside the cathedrals required 10-30 minutes on TMAX 400 which would have been at least an hour or two with Tri-X. Also, edge effects do not seem nearly as pronounced with Tri-X as with TMAX.

Because of limitations in availability of film in the 12x20 format, my preferences are TMAX400, HP5, and Bergger BPF200 in that order. However, TMAX400 has only been available once in 12x20 and Ilford 12x20 can only be ordered once per year. So I use what is available and adapt accordingly.

I rate TMAX 400 and HP5 at 250, Bergger BPF200 at 100 and reduce development to maintain good fat shadow detail yet printable highlights.

Development Times

TMAX400 diluted 1:1:13 developed in trays at 72 degrees – 17:30 for N development
Ilford HP5 diluted 1:1:10 developed in trays at 72 degrees – 17:30 for N development
Bergger BPF 200 diluted 1:1:10 developed in trays at 72 degrees – 16:30 for N development

The Development Process

Negatives are developed in trays – eight to twelve 4x5 sheets, six to eight 8x10 sheets, or 4-5 12x20s at a time. Agitation is constant in that I am constantly moving the bottom sheet to the top of the pile throughout the development process. The negatives are presoaked in water for 3 minutes and then transferred to the pyro. The negatives are developed emulsion side up and half way through the development time, I rotate the stack 180 degrees to even out development. Otherwise the end of the negatives that are lifted to remove the bottom negative from the stack tend to get slightly less development since they are repeatedly lifted above the surface of the solution even if only for a brief moment. I have tried emulsion side down development but had too many scratches in the negatives which I can not completely explain.

A tray of distilled water is used instead of an acid fixing bath. I figure any developing action which continues before the negatives hit the fixer only enhances the shadow detail with very little effect on the highlights. I started this practice when I was having some problems with my development process and was trying to eliminate variables. I saw no significant differences between an acid stop and a water stop bath so I stayed with the water. It is cheaper particularly since the stop bath must be discarded after each process cycle because of the oxidized pyro carry over from the developer tray.

I used to use a pre-packaged hardening fixer, Kodak Fixer but now use the F-24 formula because without the boric acid, it is easier on the lungs even with ventilation. Fix TMAX 400 for 10 minutes in fresh fixer. Some of the pink anti-halation dye will remain after the fixing bath but this will disappear after hypo clearing agent, washing, and Photo Flo. Use fresh fixer for each batch of film or a two bath method with the second bath used as the first bath for the next batch of film.

The developing action of pyro and the associated stain effects are very sensitive to small variations in developer temperature. Pyro oxidizes more rapidly as the temperature of the solution increases. If you tray develop, use a water bath around the trays. Without a water bath, a 68 degree solution will easily climb to 70 degrees during development just from heat transfer from your fingers. If the air temperature in the room

is higher than the developing temperature, the solution temperatures will gradually rise as well without a water bath. A two degree increase in developing temperature can have a significant effect on total negative density for a pyro negative. The accelerated action of pyro on both silver density and increased stain is additive in the resulting negative and therefore has an almost doubling effect as if the negative had actually been developed even longer. The increase in stain has the greatest impact for platinum printing. Pyro does not oxidize as quickly in a full closed tank. The staining effects are less pronounced for the same development time which must be taken into account when developing roll film intended for platinum printing in pyro.

Post Stain Step

If you are developing negatives in pyro for use in printing in alternative processes, NEVER EVER use a post stain step. Immersing the film in exhausted dark developer results in additional overall stain which is not proportional to the silver density. You are only adding fog to the overall negative grossly extending printing times for UV processes.