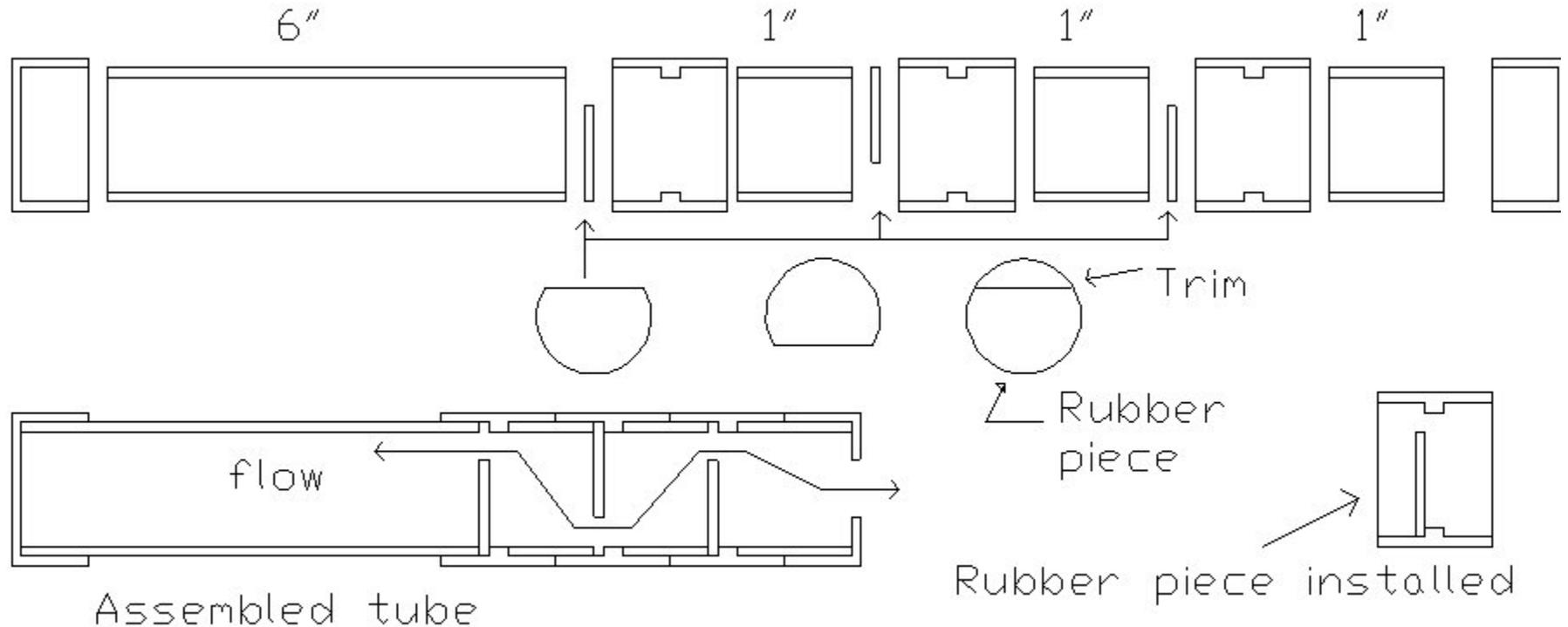


## PVC Tube Based Development Tank System for 4x5 or Paper Processing

by Cedric cedric@pacifier.com



Tube for 4x5 film or paper processing. Total cost of materials was less than \$5 at an ACE hardware store as of 12/10/97. All material is ABS plastic pipe except for the rubber pieces.

You will need 12" of 1-1/2" ID pipe, 3 - 1-1/2" ABS couplings, 2 - 1-1/2" ABS end caps, small container ABS glue, 4x4" sheet of rubber roughly 1/8" thick, a razor blade and a hacksaw.

Cut 1 piece of pipe 6", cut 3 pieces of pipe 1" as square across the ends as possible. Cut 1" pieces first, it's easier.

Cut 3 pieces rubber the same size as the outside diameter of the pipe. Use pipe to draw a circle. TRIM CAREFULLY so the pieces of rubber

fit inside the couplings comfortably (not loose).

After all three rubber pieces fit well, cut each piece as shown above to allow liquid to flow through tube. DO NOT BE AGGRESSIVE. Once all the pieces are made, assemble tube (do not glue yet) and pour water through. Be sure to assemble with the rubber pieces 180 degrees to each other to allow water to flow into tube but keep light out. You should be able to pour the water through without having to stop pouring. If the openings need enlarged, disassemble and cut more off the rubber pieces being careful NOT TO TAKE OFF TOO MUCH AND ALLOW LIGHT TO ENTER THE TUBE. Check to see if light enters tube by looking through the tube while pointing it at a light source.

Glue pieces together once you are satisfied with how the water flows in and out of tube and there is no light leak. (Do not glue ends caps on: sorry)

After the tube is glued together, if the end caps do not come off easily, lightly sand the inner surface with a fine grit sand paper until they do making sure you clean them thoroughly before using. The only reason for the end cap on the end where you pour in chemicals is to keep chemicals from coming out while you roll back and forth while developing. You could drill a hole (3/4"?) dead center in this cap and prevent this problem.

I do not know how much chemicals it takes to process film or paper in this tube. You will have to experiment

2" pipe will do 5x7's.  
3" pipe will do 8x10's.  
4" pipe will do 11x14's.

Expect to pay more than \$5 for the larger sizes.

e-mail questions to: [cedric@pacifier.com](mailto:cedric@pacifier.com) if you have questions.

Good luck.

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Date: Tue, 20 Feb 2001  
From: "Joshua L. Wein" Jayelwin@Home.com  
Newsgroups: rec.photo.equipment.large-format  
Subject: Re: PVC 4x5 Developing Tubes

I was very successful in doing just this - and quite cheaply I may add. I will email you some photos of the project directly since no one likes binaries here. I bought a length of 1.5" electrical conduit PVC pipe (the white water pipe is not light tight) and male and female connectors. I

had to use white water pipe end caps - so I painted them with flat black spray paint. I glued the parts together with PVC primer and PVC glue - very fumeey, do it outside. For each tube I made several caps. I used a darkbag to fill the tubes and cap with a dry cap. I put 50cc of XTOL and 50cc of water in an additional cap (I use XTOL 1:1 with TMX), 100cc stop in a cap, and 100cc fix in a cap. In the laundry room in the basement I would go into a completely dark closet only to transfer the dry cap with the developer cap, holding it downwards so the film stayed dry. At the start of the clock I would shake it up gently and then roll it continuously in 68 deg water (everything else was pretempered). When done I would hold it cap down, and in the laundry room with the lights off but definitely not completely dark at all, I would quickly unscrew it and quickly screw on the cap full of stop. After a bit of stop I would switch over to the fix, again in a room that was not completely dark. I never got anything but 0.04 (almost completely clear) on unexposed areas, so I was definitely not fogging any film by not going back into the closet for each step.

I have been very happy with this method. I currently use an expert drum when I have a lot of film, but if you only have a sheet or two this way cannot be beat. The tubes are so cheap you can make as many as you need for a couple of bucks. I would use the same cap of stop until it looked purple, and I would fix three sheets of film with each cap of fix.

The only pitfall I can think of is not having smooth edges. I scratched a few sheets on the antihalation side probably by sliding it in or out. I solved this with some different grades of steel wool, down to grade 0000 which really polished up the insides until it was slick smooth. Then the problem was solved.

Let me know how it goes.

-Josh Wein

"Bill H." wrote

> I'm considering making some 4x5 sheet film developing tubes out of  
> gray/black pvc pipe based on some articles I've read online. Does anyone  
> have any experience with this film developing method, and could you offer  
> any advice, cautions, construction hints etc. Thank you.

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Date: Tue, 20 Feb 2001  
From: "Brian Ellis" bellis60@earthlink.net  
Newsgroups: rec.photo.equipment.large-format  
Subject: Re: PVC 4x5 Developing Tubes

I've just completed making tubes for 8x10. I use the BTZS tubes for 4x5 but at \$70 apiece for the 8x10 tubes, I decided to make my own. I received lots of help from Sandy King, who I don't think participates in this list, so I'll repeat what he told me to do, plus a couple things I picked up myself.

1. The gray PVC pipe can be hard to find. Black ABS pipe works just as well. You can find it in the plumbing section of Lowes stores and I'm sure other places sell it as well. It is sold only in 10' lengths, at least in this part of the country, so you'll have to cut the tubes into smaller sections. For 8x10 I used 11" lengths, for 4x5 you'd probably use 6 inches or thereabouts. You can use a hand hack saw to cut the tubing but I found it hard to keep the edges straight edges with a hand saw and for the last several I used a power saw.

2. You'll need the tubing (you don't say what size film you're using - for 8x10 you need a 3" inside diameter tube, for 4x5 I believe it's one inch inside diameter). You'll also need three end caps per tube, plus one coupler per tube. One end cap is permanently glued to one end of the tube, the second is used to cover the open end of the tube after loading the tube with film and before putting in the developer, the third is the one you remove to fill the tube with developer and to remove when you're done. You'll also need some ABS or PVC cement and cleaner. The cleaner is applied to the areas to be glued before applying the glue.

3. The only decision that you need to make is whether to glue the coupler to the tube so that you remove only the end cap to fill the tube or whether you glue the end cap to the coupler and remove the coupler/end cap to fill the tube. With 4x5 it probably doesn't make much difference. With larger formats it perhaps is easier to open the tube if you do it via the coupler (i.e. if you glue the end cap to the coupler).

4. For my 8x10 tubes, the total cost of everything was about \$60 for six tubes. The cost of six 8x10 BTZS tubes would have been \$420 plus six extra end caps, probably close to \$500 total, so I thought it was worth the effort. For 4x5 the difference isn't so great, probably around \$100.

5. Phil Davis' book "Beyond the Zone System" has complete instructions for making the tubes if you have that book available.

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