½ inch PVC Irrigation Full Sliding Coupler, Round 2, version 1.2

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I have reissued this article because I found a much easier way to make the sliding coupler. Please see http://rick.sparber.org/SCAP.pdf for background.

First, you may want to make this mandrel. The coupler can be formed without it but it does make the job easier.

The pipe is ½ inch schedule 40 PVC. The 0.1 inch long bevel on the end is cut to permit the tool to just enter a piece of ¾ inch schedule 40 PVC. That black line is 1.7 inches from the end. This lets me make 1.6 inch long couplers without having to measure each time.

I used PVC cement to join the T with the ½ inch pipe. Some twisting of the T is needed and we do not want the pipe to come loose.

You will need some ¾ inch schedule 40 PVC pipe and a hot air gun. A lathe is handy for evenly heating the plastic but is not essential.

I took a 5 inch length of scrap ¾ inch schedule 40 PVC and held it in my lathe chuck. The lathe was set to run at 26 RPMs. Next, with the lathe turning, I used my heat gun to warm about 2 inches of the end of this pipe. Since it was constantly turning, the heat was evenly distributed.

It took about 20 seconds for the plastic to go from hard to the consistency of leather. Then the lathe was turned off.

Using the mandrel, I slightly expand the ID of the heated pipe. Push the tool in until you reach the line.

The mandrel slid in easily. I twisted it while the ¾ inch pipe cooled. This prevented seizing up.

After about 30 seconds, I pulled the mandrel out. Wait at least another 30 seconds.

And finally, I cut off 1.6 inches of the newly enlarged ¾ inch pipe and deburred as necessary.

Don't be tempted to first cut off a 1.6 inch piece of pipe and then enlarge the ID. The pressure you apply on the OD of the pipe will cause it to grab the mandrel tightly. Assuming you can get it off, it will be too tight for the ½ inch pipe.

The newly minted coupler was a snug sliding fit on ½ inch pipe. Not to worry, when buttered with PVC Cement, it slid smoothly.

Ready to try out the new coupler.

My PVC Cement always dries out before the can is empty. Someone on line suggested storing it upside down. Makes sense. Time will tell if this helps. They also suggested I use a lubricant on the lid threads to prevent seizing.

I primed the coupler and 3 inches of the pipe. Then I applied PVC cement over the same areas. In one quick move, I slid the coupler down the ½ inch pipe about 3 inches and then slid it back up to near the end. This simulated how it would be used to join two pipes. Not a lot of extra work time was available.

Given how close a fit the coupler is to the pipe, I expect it to seal better than my bored out coupler. Sure is easier to make.

I strongly recommend you ***do not*** use this repair methods on inside plumbing. If the repair fails outside, it will cost you some water and having to dig a new trench. If inside, the damage could be extreme.

Consider the entire family of schedule 40 PVC pipe:

PVC and CPVC Pipes - **Schedule 40**					
Nominal Pipe Size *(inches)*	Outside Diameter *(inches)*	Minimum Wall Thickness *(inches)*	Inside Diameter*) *(inches)*	Weight *(lb/ft)*	
				PVC	CPVC
1/2	0.840	0.109	0.622	0.16	0.17
3/4	1.050	0.113	0.824	0.21	0.23
1	1.315	0.133	1.049	0.32	0.34
1 1/4	1.660	0.140	1.380	0.43	0.46
1 1/2	1.900	0.145	1.610	0.51	0.55
2	2.375	0.154	2.067	0.68	0.74
2 1/2	2.875	0.203	2.469	1.07	1.18
3	3.500	0.216	3.068	1.41	1.54
4	4.500	0.237	4.026	2.01	2.20
5	5.563	0.258	5.047	2.73	
6	6.625	0.280	6.065	3.53	3.86
8	8.625	0.322	7.981	5.39	5.81
10	10.750	0.365	10.020	7.55	8.24
12	12.750	0.406	11.938	10.01	10.89
14	14.000	0.438	13.124	11.80	
16	16.000	0.500	15.000	15.43	

The coupler presented here uses ¾ inch pipe with a nominal ID of 0.824 inches that is stretched 0.016 inches to fit around ½ inch pipe with an OD of 0.840 inches. If I look at ¾ inch OD versus 1 inch ID, I see that the stretch only needs to be 0.001 inches. I don't need one but it would be fun to try.

Here is a length of 1 inch schedule 40 PVC in my lathe chuck. It was heated for about 45 seconds. I forced a piece of ¾ inch schedule 40 PVC into the bore. After waiting about a minute for it to cool, the mandrel was removed. I cut off about 1.6 inches of the 1 inch pipe.

On top is the resulting 1 inch full slide coupler with a piece of ¾ inch schedule 40 PVC inside of it. By comparison, a ½ inch full slide coupler is below it along with its mandrel.

Acknowledgments

Thanks to electronicsNmore for the great method of repairing irrigation pipes.

I welcome your comments and questions.

If you wish to be contacted each time I publish an article, email me with just "Article Alias" in the subject line.

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