

Friction Welding PVC Pipe to PVC Board, Version 1.1

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PVC pipe is a low cost and easy to use fabrication material. Many projects can be completed by just using standard couplers.



PVC trim board is relatively expensive² but easy to use. An 8-foot plank lasts me about a year because I use it sparingly.



It is possible to directly weld PVC pipe to PVC trim board without first drilling a close-fitting hole. And you don't need to use PVC cement.

The trick is to spin the PVC pipe while pushing it into the PVC trim board. The generated heat melts the board and softens the pipe. Left to cool, you get a solid joint. I was unable to break the PVC apart using a slip joint pliers and a vise.

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² Available at Home Depot and Lowe's.



I built this tool that permits me to spin the PVC pipe. It consists of a 1/2-inch schedule 40 end cap and coupler.

To make this tool spin with the least wobble, I used my lathe. First, I chucked up a piece of 1/2-inch schedule 40 pipe that had an end cap cemented to the end. I drilled a hole through the cap with a “W” drill to provide clearance for a piece of threaded 3/8-inch rod.

If you do not have a lathe, a visit to your local hardware store will likely produce a special purpose coupler that can do the task. I would look both in the plumbing and irrigation aisles.

I found a nut that would slide through the pipe. Then I put a nut and split washer on the end of the threaded rod and was able to catch the inside nut. Alternately, I could have used a 3/8-inch Socket Head Cap Screw on the inside. The threaded section extending out the bottom of the tool is harmless.

After cutting the pipe to stick out about 1-inch, I slipped a 1/2-inch schedule 40 coupler over it. There is no need to cement it.



The tool chucks into my electric drill. For more precision, use a drill press.



Here I have loaded in a short piece of PVC pipe.



I used a piece of scrap pipe as my template.



My next tool was formed from a piece of scrap 1/8-inch thick aluminum plate - I drilled a 7/8-inch hole in it. The pipe is a loose fit.

This plate will guide the PVC pipe until it can sink into the PVC board.



Next, I clamped the plate down and loaded the PVC pipe into the tool.



I only needed to run the drill for a few seconds while pushing down to accomplish the weld. I go in about 3/4th of the way through the board.

It is possible to go all the way through the board. I have never had a need to do so and don't know if the joint is weaker.

Wait a few minutes for the plastic to cool, and then the tool can be pulled off. This process can be sped up by dunking the assembly in water.



This close up shows bits of swarf that were caught between the pipe and the plate. They can be removed with a sharp knife.

Acknowledgments

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I welcome your comments and questions.

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