

A Direct 1/4" Line to PVC Pipe Irrigation Coupler, version 2.1

By **R. G. Sparber**

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Ideas often keep evolving after a "good" solution is found. Such is the case with connecting a 1/4" line to PVC pipe. Actually, the "better" solution was staring me in the face.



I originally showed this coupler as an example of an expensive and complicated solution. The 1/4" line is forced into the hole in the top and the coupler screwed onto a pipe as can be seen on page 3. This complex solution contains a super simple answer: just copy the hole!



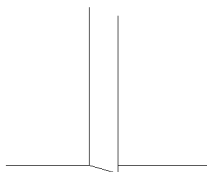
First I used a #7 drill to cut a hole in the PVC pipe. Then I used a countersink to cut a cone shaped opening. I was careful to leave about 1/32" of the hole's wall untouched. This was a decent approximation of the store bought coupler.

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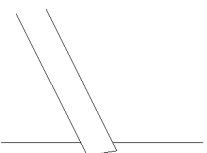
Then I cut the end of the 1/4" line at about a 30 to 45° angle.



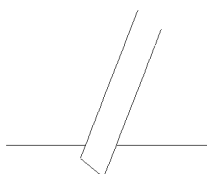
Pushed the line into the hole



and pivot it to the left.



Then pivot it to the right. This will cause the tube to walk its way down into the hole. Keep going back and forth until the tube is in about 1/2".





Using my test fixture developed for version 1.0, I verified the connection would hold. It was even tighter than the previous design. And since it doesn't even use a 1/4" line coupler, it is actually lower in cost.

It will be hard to beat this design.

Version 1 of the design:

On most Mondays you will find me working with my good friend Ed Cabullo. Part of the enjoyment is kicking around solutions to problems. Recently I proposed the problem of how to connect a ¼" irrigation line to a PVC pipe without spending a lot of money. This has become an issue since I started to change out my failing 0.710" diameter "soft pipe" for ½" PVC "hard pipe".



One way to make this connection is by cutting the existing PVC pipe, adding a T followed by a short length of pipe which is capped in a threaded adapter. Then a special coupler engages the threads and terminates in a fitting that accepts the ¼" line. You are looking at many dollars worth of plastic.

It is also not easy to insert that T. If the pipe is already in the ground, you will need to dig back a few feet on each side in order to bend up the ends. In one case, I snapped off the pipe. Clearly I needed a better way to connect a ¼" line!

The solution is mostly from Ed and satisfies all of my criteria:

1. Low cost
2. Uses easily obtained parts
3. Uses only common tools



Each joint will use a single double ended $\frac{1}{4}$ " line coupler (about 25¢) and about a $\frac{1}{4}$ " length of $\frac{1}{4}$ " irrigation tubing. The $\frac{1}{4}$ " long piece of $\frac{1}{4}$ " copper tubing is the only custom tool needed. You will also need a pair of large slip joint pliers, a $\frac{17}{64}$ " or F drill bit² and a drill.



Using a large slip joint pliers, I push the short piece of tubing over one end of the coupler. The copper tubing protects the other end of the coupler.



Push until the irrigation tubing is fully seated on the flange.

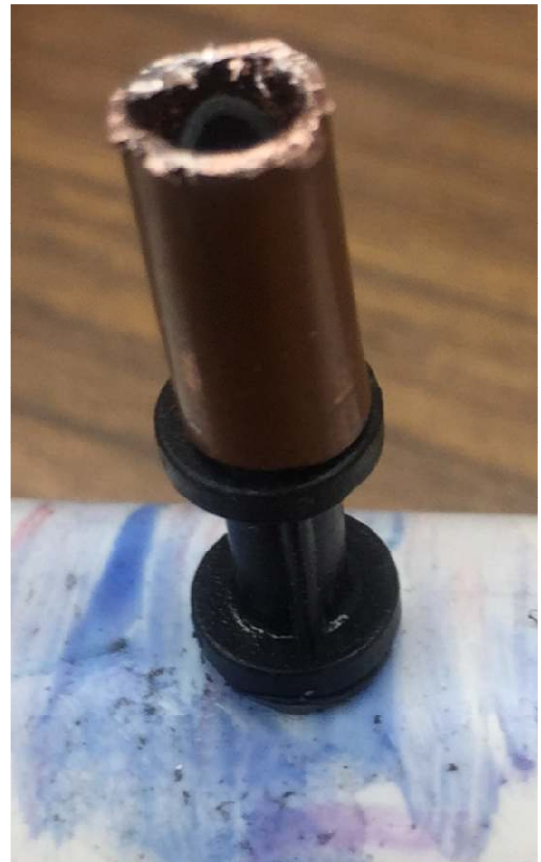
² The $\frac{17}{64}$ " drill bit will make it easier to insert the coupler but will leak a little. The F drill bit will be a little more difficult during insertion but will barely leak at all.



Here is my "test bed". I can screw a hose onto one end and pressurize this length of pipe with city water. My first test connection was previously installed and I have drilled a hole for my second test connection. My goal here was to find the best hole diameter. It must be large enough to pass the tube and coupler but not so large that it leaks "excessively". Some leakage is acceptable because the irrigation pipe is only pressurized for short periods of time.



The copper tube and slip joint pliers are again used. This time I am pushing the tube and coupler into the hole. I stopped when only about 0.1" of the tubing was exposed.





The copper sleeve is removed and $\frac{1}{4}$ " irrigation line is attached. In my test bed I used a short length of line with a plug in the end.

My first hole was $\frac{17}{64}$ " (0.266") in diameter. It leaked a little. My second hole was an F drill (0.257") and had almost no leakage. However, it was noticeably harder to install.



Here is my test bed under pressure. The coupler in the 17/64" hole is moist while the coupler in the F hole is almost dry.

I'll call this a success and go celebrate with Ed!

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.

Rick Sparber

Rgsparber.ha@gmail.com

Rick.Sparber.org

