

# Thermal Forming PVC Pipe, version 2.0

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By **R. G. Sparber**

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If you go to YouTube and search with "forming PVC" you will see a few people heat forming PVC into useful shapes. Cool and useful idea.

At the moment I don't have an application for this technology but still wanted to try it out.



In all cases I used the commercial grade heat gun shown here. I think using a torch would be unsafe and also give poor results.

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My first experiment was with a 5" length of 1" OD pipe. I held it in my lathe and ran at 26 RPM to insure uniform exposure to the heat. While I heated the end, I tested for the point where the plastic went from hard to a leather consistency. It is not an abrupt change and there is about 30 seconds of work time.

Once the end of the heated pipe was soft, I pushed another piece of this pipe inside by holding the insert with a pliers and pushing. It went in rather easily. I stopped when about 1/4" was sticking out. After cooling, I used a left hand cutter to trim up the end. That insert is locked in place.



In this case I first blew hot air down the short length of pipe until it was leathery. Then I inserted two rectangular cross section bars and prying them apart for about 30 seconds. The result is a rectangular to round transition piece.



These two samples were created by first sawing through one side of a each short pipe axially. Then I heated the opposite side and pried them apart mostly with my fingers.

This approach could be used to form drawer inserts to hold round tools.



This flat piece of PVC started as a bit of scrap from a 5" diameter pipe. I sawed through one side, heated it evenly, and then pressed it flat with a bar for about 30 seconds.



I took a piece of flattened pipe, reheated it, and put it in my finger brake.

So here I am with a few great solutions. If I only had problems to solve with them!

After Version 1.0 was published, I received ideas from Marv Klotz and Frank S from the [homemadetools.net](http://homemadetools.net) site.

Marv wrote:

"specialized nozzles for your shop vac - e.g. a T-shaped T-slot cleaner

artistically shaped plant trellis - fine holes drilled in pipe to "artistically" water the plant

roadways for a marble machine

miniature funnels for filling small containers"

Frank S said he forms cable clamps from flat pieces of thermal plastic.

In an attempt to make a funnel, I heated some PVC pipe in the middle and put it under tension. My hope was to neck it down.



I learned that it will tear before it will neck down.



In this case I first sawed a series of slots in the end of the pipe and then just applied heat. You can see how it opens up like a flower. Might lend itself to a fancy watering nozzle.

Using  $\frac{3}{4}$ " PVC, I was able to insert a second piece of pipe inside the heated one. With  $\frac{1}{2}$ " PVC, the hot pipe buckled. There are definitely limits to how much hot PVC will expand and it does not like to contract at all.





Following Frank's suggestion, I first took a piece of flattened pipe and bend a right angle.



Then I reheated the strip and wrapped it around a mandrel.



After about 30 seconds it was cool enough to remove the pliers.



I rounded the corners and drilled the mounting hole. It looked very good. Then I tried cleaning up the surface with my 3M wheel and learned not to do that again.

Clearly, Frank's idea will come in handy in the future when I need to make custom clamps.



This is what the pipe looks like after I heat up the end without touching it.

When hot, this PVC behaves like leather so why not try punching out disks?



Using a 3/8" punch, I had no problem cutting disks until the plastic started to cool.



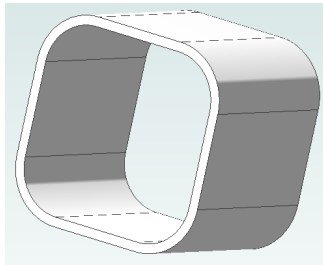
Then I tried my 1/4" punch and it worked just as well.

Not sure where I would use these disks but then that was not the point of this journey.

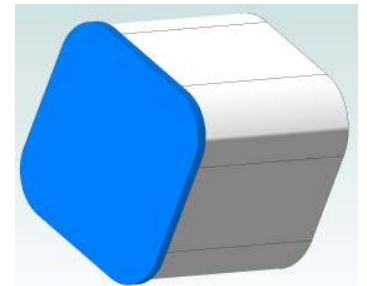
Nelson Collar suggested:

"Take a large diameter of PVC pipe. Cut one side and lay out flat. Take a block of wood, lay the sheet over it and heat to make a nice wrap forming a box."

I'm sure this would work. Don't forget that PVC solvent will weld smooth bits together and form a very strong bond. So ends can be added to the box to finish it up. The result would be a very tough box. I would use oversized piece on the ends and then use the formed pipe as my guide to saw and sand flush.



Nelson's idea got me thinking. If you really wanted to be fancy, figure out what size block of wood fits inside a length of PVC pipe. Then heat up the pipe and force the wooden mandrel inside. No seam around the perimeter.



## Acknowledgements

Thanks to Marv Klotz, Frank S, and Nelson Collar for their great ideas.

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](mailto:Rgsparber.ha@gmail.com)

Rick.Sparber.org

