

Making Boxes from PVC Sewer Pipe, Version 1.1

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Warning: this process involves heating PVC with a hot air gun. Heating beyond what is needed to soften the plastic can cause the release of toxic fumes.



Four-inch diameter sewer pipe cost me ten cents an inch at my local Ace Hardware. With my heat gun and some scraps of wood, I turn this pipe into containers. Clear PVC cement lets me weld on bottoms and handles.

A good run-of-thumb for designing one of these boxes is that the sum of the side must be about 14-inches. If smaller boxes are desired, go for 3-inch pipe. I have made boxes as small as $\frac{3}{4}$ -inch on a side using $\frac{1}{2}$ -inch PVC pipe.

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I first saw off a length of sewer pipe equal to the finished height of the box plus about 0.1-inches. In conjunction with the vise jaws on my horizontal bandsaw, the block of wood inside the pipe provides a solid clamping force.



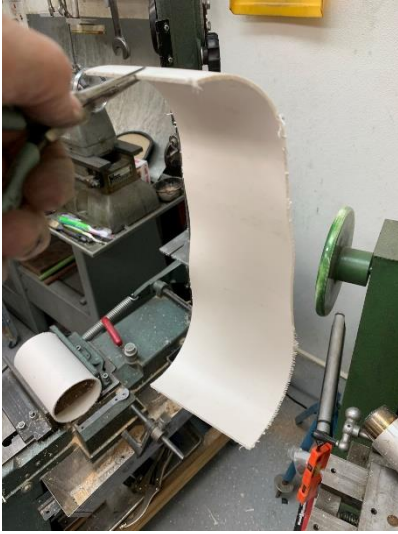
This box will have a floor, so I cut a second piece of pipe about 0.2-inches longer than the outside of the finished box.



I then saw through the wall of the pipe.



In preparation for making a PVC board, I have ready a flat piece of wood. The picture also shows a metal plate, but this turned out to be a problem. The metal cools the plastic too quickly. I later found that a second piece of wood worked much better.



Now the fun begins. I hold the PVC pipe with pliers while heating it with my hot air gun. The plastic unrolls and becomes the consistency of leather.



I quickly place the hot plastic on the board and flatten it with a second board. After about 30 seconds of pushing down, I end up with a nice piece of PVC board. Thanks to Nelson Collar for showing me this trick.



Purely by dumb luck, my box form is just a piece of 4 by 4. I beveled the top corners to make it easier to force on the hot pipe.

Recall that a 4 by 4 is 3 ½ inches on a side so I get my needed 14-inch perimeter.



I hold my piece of pipe in my pliers and heat it with my gun. It is hot enough when the shape goes from round to almost teardrop.

My hands are fairly “dead” so handling this hot plastic for short periods of time is fine. If you are more sensitive to heat, gloves may be needed.

The hot plastic slides onto the form. You can see that it is a loose fit. This is because the plastic has stretched a little.



I heat the plastic again, and it shrinks into place.



A bit of water sprayed on the plastic quickly makes it solid again. I can then pull the plastic off of the form.



The top and bottom of the plastic box are slightly distorted. I use a light touch on my belt sander to true them up. The PVC cement can only work when the surfaces are in direct contact.



I coat the bottom edge of the box and the matching surface on my PVC board with clear PVC cement. After adjusting the parts to have a small lip on three sides, I put on some weights. Since I'm not in a hurry, I let it set up for an hour.



Even though there is very little contact surface, the box and bottom are securely welded together. Small gaps do exist, and this box does not hold water. If you want it to be water-tight, I suggest applying more pressure.

I first trim the PVC board, leaving about 0.1-inch of margin.



Then I use my disk and belt sander to reduce the board so it is flush with the box.

If you want to have a top for the box, heat bend some of the PVC board into bits of angle and cement them to the top of the sides. Then cut some board for a rough fit. Drill holes through the top and angles and secure with screws. And, finally, sand the top to match the contour of the box.



This box replaces a drawer. Again, by dumb luck, the correct size happened to have an inside perimeter of 14-inches. I later cemented on the pull and the stop.

Heat-forming low-cost PVC sewer pipe has a lot of potential. I hope others give it a try and send me pictures to include in this article.

Acknowledgments

Thanks to Nelson Collar for showing me how to make PVC board from pipe. It inspired me to think about making boxes. Thanks to Andrew L. Ayers for warning me about the dangerous fumes. Many others have chimed in later, and I appreciate them too.

I welcome your comments and questions.

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