

## Making and using PVC jam chucks

If a lathe is just a spinning wood clamp, then one of our biggest challenges as woodturners is to figure out what kind of clamp to use. Unlike earlier days when some woodturners were comfortable covering screw holes on the bottom of a vessel with a piece of felt, we are now expected to complete our works in such a way that it is impossible to see how they were held on the lathe.

Probably the most common approach to turning a generic, side-grain object is first to rough the outside between centers and add a shouldered tenon for a scroll chuck; second to reverse the piece, mount it in the chuck and hollow the inside; and third to reverse again, turn off the tenon, adjust the final shape of the bottom, and part off. The question is how to hold the item for that last reversal. There is a wide variety of established techniques and tools which permit us to do so. A vacuum chuck is nice if you have one, but most of us don't. If the rim of the object is the widest diameter, you can grab the rim with the rubber knobs of a set of jumbo jaws, if you have a large enough set, or an adjustable Longworth chuck. Many of us may not have those either. Alternately, you could use a big disc of wood, screwed to a faceplate, with a step carefully cut to the exact diameter of your piece (could be a mortise or a tenon). Or you can build a Straka (donut) chuck. This is a scary and dangerous thing, and it doesn't permit good access to see or modify the shape of the bottom around the foot. None of these (except the vacuum chuck) will hold a natural-edge vessel, and only the tenoned disc might hold one with an incurved rim. By far the simplest approach is the use of a jam chuck.



A jam chuck is often just a piece of wood held in a chuck and shaped to fit and drive the piece from the hollowed, concave inside surface. The drawback for jam chucks in general is that the tail stock has to be brought up to hold the object in place. This results in a small nib at the contact point that has to be removed (if you aren't up to parting with one hand and catching with the other, as some professionals do so readily). I remove the bulk of the nib with a thin "Japanese" pull saw and sand down the remaining stump quickly to almost nothing with a little sanding drum on a Dremel tool. A little hand sanding completes the work so that all evidence of the mount is gone. This little ritual can be enjoyable, as it marks the completion of the piece.

Last month in these pages, we saw how to make and use a special jam chuck for delicate hollow forms. For bowls, a larger diameter jam chuck is required to provide the needed directional stability. This, finally, brings us to the point of this article. Is there a simple, cheap, easy to obtain common object that will make a good, stable jam chuck? The answer is "yes" – PVC pipe fittings from the plumbing department of your local hardware store.

The use of PVC pipe fittings as jam chucks is very popular among woodturners, and people who try them rarely use any other method. (Make sure you do *not* get the "foam core" type. They are

quick and easy to make and use, and they are safe. One of their benefits is that they come in various sizes, and a single unit will fit a wide variety of bowl sizes and shapes – and they are reusable, virtually forever. In use, they permit a bowl to stand out beyond the headstock (or beyond the protruding motor housing if you have that backwards motor mount in a Jet 1236).

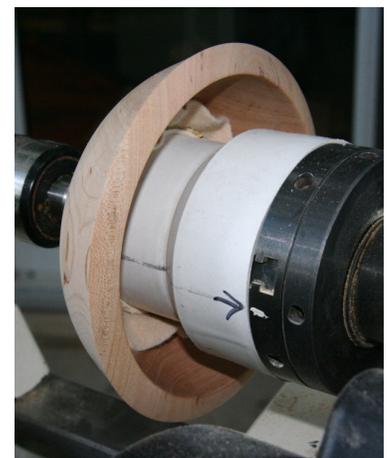
I have two to cover the full range of objects I might want to make on my 12" lathe. As with anything, there are some do's and don'ts and some tricks of the trade. My goal in this article is to encourage you to try one and to give you enough information to get you off to a good start.



The basic idea is that one end connects to your scroll chuck in some manner (more on that later), and the other end is padded with some kind of material that will provide enough friction to drive the turned object without undue pressure and will not mar the turned and sanded surface. The padding can be glued on, or it may be simply inserted freely between the PVC and the wood surface when the tail stock is brought up. Mine both have the padding glued on so I don't have to go looking for it.

To begin with, both ends of the PVC must be smooth and true. The scroll chuck end is particularly important – you want a very true, firm fit at the shoulder of the jaws. You will want to sand or scrape off any mold marks or other imperfections in the edge. You will want to do the same to the working end, and you may wish to round the edges over a bit. You may find yourself turning the edge to true it up. If you do, take great care – many people find turning plastic, particularly on an end, to have some exciting consequences – don't ask me how I know. (I recommend a negative-rake scraper.)

Your scroll chuck should already have a clearly defined mark on it to permit work pieces to be marked and remounted in the exact same orientation. Check to make sure the head stock end of the PVC matches the scroll chuck shoulder perfectly all the way around and mark the PVC at your existing chuck orientation line to ensure the same fit every time. If the end is not true, sand it carefully, maintaining perpendicularity, until it is. Check the free end with the lathe running to make sure it is straight. This isn't super critical, within reason, because the axis will be defined by the tail stock point and the working end of the PVC is padded. Every time you use this jam chuck, make sure the mount on the scroll chuck is straight, true, lined up with your mark, and firmly against the shoulder all the way around.



Many applicable materials for the bowl end are available in hobby stores. I use some sheets of relatively thin foam or fibrous material from the hobby store. That thin but "heavy", rubbery kitchen-shelf lining "paper" material is good. Some people have reported using flexible tubing split down the middle and run around the edge. Others use carpet padding or computer mouse pads with apparent success, but in my experience these thicker materials could lead to problems. I had a situation where I could not get a piece round no matter how lightly and carefully I cut or

how much shear scraping I did. I traced the problem down to the fact that I had put in two sheets of padding instead of one. When I took the second one out, my cuts immediately trued up the piece.

You do not need a lot of tail stock pressure. As with spindle turning, you want to use only the absolute minimum pressure needed. When I use too much pressure, it makes funny creaking noises – that’s a sure sign to reduce, not increase, the pressure. Again, less is more – use a minimum of both padding and pressure.

There are (at least) two ways to connect these PVC jam chucks to the head stock. As seen in the photos, I have one of each. My smaller one is 3 3/8” long and has a diameter of 4” at the chuck end and about 3 3/8” at the business end. It is relatively light, with a wall thickness of just over 1/16”. This works very nicely for bowls up to ten or more inches in diameter, as long as they are not too deep or heavy. I hold this one in the expansion mode with my #2 jaws. In online forums, perhaps too much of an issue has been made about the possibility of cracking the PVC with outward pressure by over tightening the expanding jaws. I find that I have to tighten the jaws quite firmly to keep them from loosening and spinning free in use. This can be a problem. I expand the jaws quite tightly (in a sensible, sensitive manner, of course), and, even with the relatively thin wall, I have not experienced any damage to the PVC over a period of several years. I suppose one could put a thin lining of some friction material around the inner lip of the PVC to make it grip the jaws better, but this could also provide unwanted wobble. I prefer to put the PVC directly over the steel jaws for solid accuracy.

My larger version has end diameters of 5” and 4 1/2” and is 6” long (without the wooden insert). It is a different kind of plumbing product. It is made of a much heavier material and weighs considerably more than my smaller one. It is too big to fit any of my chucks, so a different method of mounting it to the lathe is required. I turned a wooden insert that fits very tightly into the center of the PVC cylinder and inserted it. You could add glue or screws if needed, but I got a perfect, very tight pressure fit. A recessed tenon is turned on the outside end so it can be gripped in my standard scroll chuck jaws (see photo). I made this specifically to use on a very large, deep, heavy natural-edge bowl (the one used at Mike’s picnic last year for drawing the raffle slips). It worked just fine, and it awaits my next large project.



There you have it. I couldn’t turn without these – I use the smaller one all the time. It’s one of the simplest, most effective, easiest-to-use, and cheapest tools I have. Try it; you’ll like it!

*Always use common sense. Things that work in one situation may not work in another. Follow all Safety Rules. If it feels wrong, it probably is; stop and rethink. Your Mileage May Vary*