

# Make Your Own Chucks for a Vacuum System

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If you have not yet experimented with vacuum chucking, we urge you to do so. In many situations, vacuum chucks make it easy to attach a turning to the lathe. Once a vacuum chucking system is hooked up to the lathe, it is relatively simple to make your own chucks or there are a wide variety of commercial ones available. In order to make your own and save money, follow these easy directions.

First, make the base for the vacuum chuck out of wood. Glue up plywood or hardwood to at least 1" thick to form the base of the chuck. Find and mark the center of your glued-up base and scribe a circle that is at least 1" larger in diameter than the outside diameter (OD) of PVC pipe you will be using. Bandsaw the base to a rough, round shape following the scribed line. Be certain to mark the center of the base carefully because you will drill a hole here in the next step of this process.

Purchase one of the lathe spindle taps ([www.leevalley.com](http://www.leevalley.com)) that allows you to thread wood with the specific thread size for your lathe's headstock. Drill a hole dead center through the face of the glued-up base, following instructions provided with the lathe spindle tap. Thread the hole with the

lathe spindle tap and screw this base onto the lathe. Now, finish-turn the base round and sand the surface and edges so they are smooth. If the base wobbles slightly on the lathe, either turn away the wobble or construct a new base. The base is now ready to have the PVC pipe inserted. We usually finish the wooden base with shellac or varnish in order to seal and stabilize the wood.

Get the section of Schedule 40 PVC pipe that you are using for the chuck. The length will vary to suit your needs, but a piece that is about 2" to 3" long is generally suitable for most uses. PVC pipe couplers are best to use since they are thicker and the ends are true, however, if you carefully cut it, the PVC pipe itself is adequate.

Don't be afraid to use a longer section of pipe if you are trying to reach into the bottom of a deep hollow vessel to hold it in place with vacuum pressure. Cut the pipe to the length that you desire. Carefully cut the pipe on your tablesaw, holding the pipe firmly against the miter gauge and rolling the pipe to complete the cut. Do this with care because both ends of your pipe need to be smooth and at right angles to the pipe. As always,

when using a table saw remember to watch out for your fingers, wear a faceshield, and use dust protection.

Carefully measure the OD of the pipe and mark this on the face of the turned base. Using a parting tool, cut a groove slightly less than the diameter of the pipe and gradually work the groove up to the *exact* OD of the pipe until the pipe just fits the groove. When you place the pipe into this groove, it should fit snugly with no lateral movement. If you are satisfied that you have cut the groove at the exact point, deepen it to about 1/2".

Use quick setting, two-part adhesive (JB Weld works great) and goop up the groove with the adhesive. Push the pipe into the groove and rotate it back and forth until it seats against the wood. Bring up your tailstock, put a small, flat piece of plywood on it, and force the plywood against the pipe with the tailstock so that the pipe is held onto the faceplate while the adhesive sets. Be sure the pipe doesn't wobble on the base. Turn your lathe on at the lowest speed and allow it to turn while the adhesive sets. This will prevent the adhesive from running and help ensure that the PVC pipe runs true.

After the adhesive sets, check that your pipe is true. To do this, remove the tailstock and the piece of plywood. Turn your lathe on. If there is a small amount of wobble, use a sharp tool to turn away enough of the PVC pipe to remove the wobble. If, for some reason, there is too much wobble, discard this chuck and be more careful with making your next one.

In order to use the chuck, you will need a piece of closed-cell foam sheet or similar material to make a gasket that will seal the turned object to the PVC pipe of the vacuum chuck. You can purchase closed-cell foam sheets at most art stores, as well as discount stores such as Wal-Mart. Cut rings of the sheet that are a bit larger than the OD of the pipe you are using for your chuck. The size of the inner hole of the ring isn't critical; just leave at least 1/2" width of foam to stick to the end of the PVC pipe for each chuck. If you've purchased the foam with the adhesive (crack and peel) on the back, stick it onto the face of the pipe. If you can't find the adhesive-backed foam, use spray adhesive to hold the non-adhesive-backed foam in place. Spray the back of the foam before you attach it to the chuck. Now, screw the chuck onto your lathe or onto a portable carving stand, turn on your vacuum, attach your turning, and there you have it, your completed lathe/carving stand vacuum chuck.

The nice thing about using PVC pipe is that you can use the wide variety of sizes available. Even short scraps are usable. If you are resourceful, you may not even have to purchase any pipe for the chuck. Check with local plumbers or builders and ask them to save the small cutoff pieces of pipe that they routinely toss away. You can make many chucks for a minimum amount (probably less than a dollar each) so you have exactly the chuck you need for any turning or carving job. ■

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Bottom view of completed vacuum chuck.



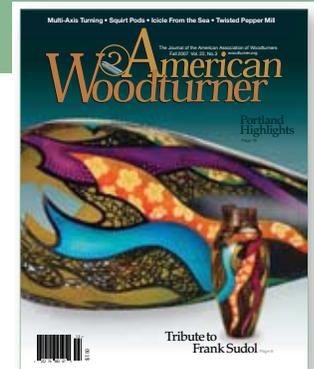
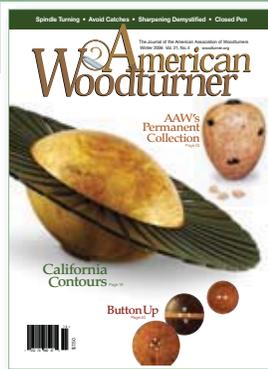
Top view of completed vacuum chuck with gasket in place.



Assortment of vacuum chucks ready to use.

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