

Turning Salt & Pepper Mills



Introduction:

Salt and pepper mills make great gifts and an excellent addition to your functional craft line. They can be turned from figured woods, plain woods, you're own laminated blanks, or from commercially available laminated products such as Spectrally. Be sure to purchase the pepper or salt mill parts before sizing your blanks. Sometimes the kits come with an instruction sheet that may or may not be helpful. I followed one manufacturers instructions and got all dazed and confused only to discover that the instructions were way more complicated than was necessary to turn the kit. I checked with one of my turning buddies and he agreed that the instructions were terrible. The following instructions require the purchasing of a forstner drill bit extension to be used to drill the hole all the way through the bottom of the pepper mill. I find it way easier and definitely simpler to use a drill bit extension than to have to turn a couple of extra tenons to hold the blank so that it can be drilled from both ends, which rarely ever meet in the middle anyway. Also by adding the extra tenons it makes it much more difficult to line up the grain where the top and bottom meet. My preference is to use Colt forstner bits and the Colt extension system as the bits cut through end grain more efficiently and the extension helps keep the drill bit ruining true as it does not require a set screw to hold the drill bit in place. They are more expensive and well worth the money. Plus as an added bonus they stay sharp longer than any other drill bit I have used when cutting end grain. There are many ways to approach turning pepper and salt mills I will be discussing the methods that I find to be be the most efficient and easiest to follow. You may find Nick Cooks article titled "*Pepper Mill It's A New Grind*" in the American Association of Woodturners Journal at www.woodturner.org. Or better yet just read the following handout.



Materials:

Pepper or Salt Mill Kit

2.5" x 2.5" Blank of appropriate length for your mill Kit (plus 1 1/2" extra length to accommodate the two 1/4" tenons for drilling and mounting and the tenon for the 1" tenon for aligning the top to the bottom)

Poplar, Maple or some other scrap wood for turning a jig to hold the pepper mill blanks after drilling to out the center to help hold the pepper mill bottom for turning)



Jig for holding pepper mill bottoms after drilling

Tools:

1 5/8" Forstner drill bit (I prefer to use Colt Forstner bits when drilling end grain)

1 1/16" Forstner drill bit (colt bits are my preferred bits)

Forstner drill bit extension (once again I like to use the Colt extension for use with Colt forstner drill bits)

1/4" or 7mm Drill bit for hole in top for metal rod (I like to use the 7mm drill bit as it provides a bit more clearance for the grinder rod)

Small drill bit sized to drill pilot hole for screws

Philips Screw driver sized to fit screws

Spindle Roughing Gouge (I use a 1 1/4" Spindle Roughing Gouge)

3/8" Spindle Gouge

1/4" Parting Tool

1/16" Parting Tool

Skew

Procedure:

1. Mount the Pepper Mill/Salt Mill blank between centers and turn it to a cylinder.



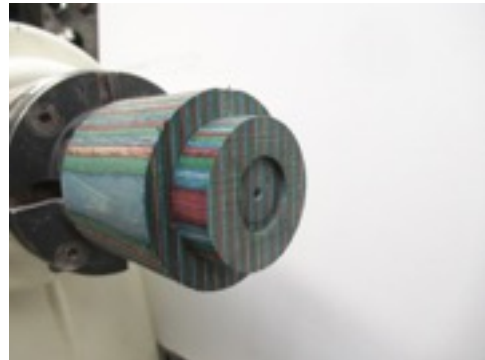
2. Next turn a tenon on the end of the end that will be the top sized to fit in your chuck approximately 2 1/8" in diameter and roughly a tad less than a 1/4" long.
3. Now decide where you want to divide the top from the bottom and part down leaving a tenon on the top of the bottom so that the bottom can be mounted in a chuck to be drilled. Be sure to leave enough room for the tenon slightly less than a 1/4" long that will fit in your chuck and for a spigot/tenon that will be inserted into the finished mill to line up the top that is 1 1/16" in diameter or slightly larger so that you can get a good tight fit when inserting the top into the bottom and at least 3/4" to 1" long. The spigot on the top is used to align the top in the bottom when the mill is completed. Be sure to Do not forget to leave a little extra room for parting the top from the bottom



4. After parting the top from the bottom, mount the bottom in a chuck so that you can drill the holes in the bottom of the bottom to fit the mill mechanism. The first hole is 1 5/8" in diameter and about 3/8" deep the next hole is 1 1/16" and drilled all the way through. *Note: I like to use a Colt forstner drill bit mounted in their drill bit extension. I find their drill bits to last longer when drilling end grain and their extension is such that the drill bit is still centered when attached to it. Choose the appropriately sized extension for the size of mill you are turning.*



5. Once you have finished drilling the bottom remove it from the chuck and insert the top into the chuck so that you can drill a recess for the metal disk that guides the mill rod and a $1/4''$ hole all the way through the top for the metal rod.



6. Once the top is mounted in the chuck face off the the tenon and use the corner of a skew to put a little dimple in the center of the tenon as guide for the drill bit. Then drill a recess for the metal plate approximately $7/8''$ check the diameter of the metal plate and choose a bit that fits it or is slightly undersized so that you can later open up the recess with a scraper so that the disk fits snugly. Drill to a depth so that the insert is flush with or slightly recessed in the tenon.



7. Next drill a 1/4" hole all the way through the top. You can drill the hole up to a 1/16" larger than the 1/4" required so that the rod rotates easily in the hole but yet does not rattle around in it. I like to use a 7mm drill bit for this step.

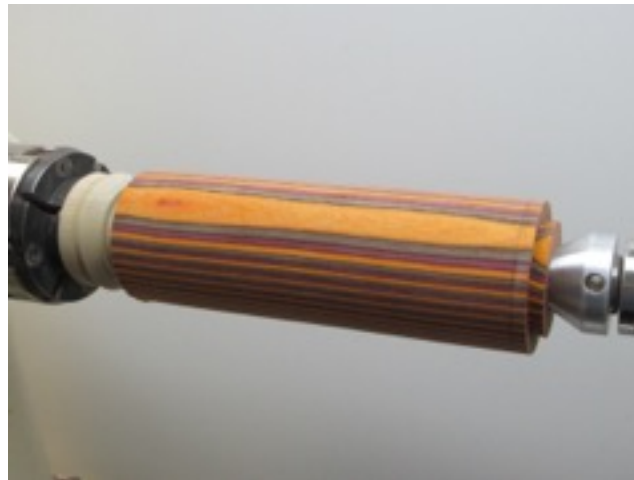
**If you are going to turn several pepper or salt mills, I highly recommend that you turn a simple jig to help hold the bottoms after drilling the required holes in the bottom. If you are only going to turn one pepper mill it may still be worth your while to turn a simple jig. At the very least it gives you some extra turning practice and may even help you to realize how simple and easy it is to make a jigs that will help make your turning easier and more accurate. Another benefit of the jig is that it allows you access to the very bottom of the mill so that you can undercut it slightly tonsure that the finished mil will sit flat.*



8. Mount a piece of Maple or Poplar or any other hardwood in the lathe approximately 2 1/2" square by 2" long and turn close to a cylinder leaving it large enough in diameter to turn a tenon on it to fit your chuck.
9. Once the tenon is turned fit the blank into the chuck and finish turning it to a cylinder. Next turn a 1 1/16" tenon approximately 1" long to fit inside the hole that was drilled all the way

through the pepper mill blank. *This tenon should fit fairly snugly as it will help to hold the blank for turning.*

10. Next turn a tenon sized to fit the 1 5/8" diameter by 3/8" deep hole in the bottom of the pepper mill. Be sure the shoulder is flat or slightly under cut where it meets the tenon so that the bottom of the paper mill will register on it. Once again it is best to have a good tight fitting tenon as this will help keep the mill form slipping as you turn it. It helps to use the recently drilled bottom to insure a nice tight fit. A good tight fit helps to keep the blank from spinning on the jig or from being turned off center.
11. Mount the bottom in the jig and bring up the revolving center with the cone attached and trim off the mounting tenon on the top of the bottom slightly under cutting in the process. Once this is done go ahead and under cut the bottom so that it will sit flat on a table.



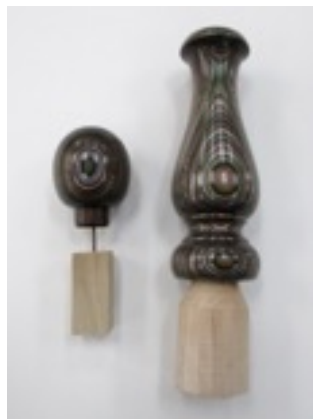
12. Once you have mounted the jig in the chuck it is time to put the top and bottom together and then mount them in the lathe between centers and turn your final shape



13. Once you are satisfied with your design you can either separate the top from the bottom and sand the mill, or you can remove the top and bring the revolving center cone up to hold the bottom for final sanding. But first check to be sure that the length of your turned parts will work with the length of the mechanism that you are using and that enough of the rod protrudes so that the cap can be screwed on.



14. To finish off the top of the top, gently mount it in the chuck being careful not to crush the tenon as it still needs to fit comfortably in the 1 1/16" hole that was drilled all the way through the bottom.
15. Once the top has been cleaned up, go a head and sand it.
16. Now that your parts are turned and sanded it is time to apply the finish of your choice. I generally use Mohawk clear gloss lacquer in a spray can. To spray the finish on I make a couple of jigs from scrap to help hold the parts for spaying. Nick Cook on the other hand likes to use a urethane finish that he applies while the mill is still on the lathe.



17. Now that the finish has been applied and has had plenty of time to dry, it is time to get out the mechanism and put all the parts together to complete the mill.

18. Be sure to follow the instructions that came with your mechanism when putting all the parts together. Below is a photo of how the parts line up for the mill used in this handout. Be sure to drill pilot holes for the screws to make it easier to screw them in and to prevent splitting the wood. (my kit requires a 3/32" drill bit for the pilot holes)



19. Now that you have put everything together, fill the mill with your favorite pepper or salt and grind away.

