

## **The Perfect Peppermill by Pat Scott**

1. Decide on a design (shape) and sketch it out full scale.
2. Use a dry blank of the appropriate size (typically 3" x 3" x whatever length).
3. Mark the center on both ends of the blank, then mount it between centers using a 4-prong drive, step center, or held in a 4-jaw chuck.
4. Turn the blank to round and cut a shallow tenon on each end. I usually orient the blank so the top is towards the tailstock.
5. Measure and mark the head and body length from your drawing (don't forget to allow 1/2" or so extra length to the head measurement for the parting cut and spigot that fits in the body).
6. Back off the tailstock pressure slightly and use a 1/16" thin parting tool to part the blank down to as small as you dare. With the lathe turned off use a hand saw to cut the rest of the way.

### *Prep the body*

7. Mount the body by the tenon that was created in step 4, and turn another shallow tenon on the end that was just parted. This tenon will be used when drilling the bottom of the mill.
8. Flip the body around and true up the bottom with a slight undercut.
9. Drill a 1-5/8" diameter hole 1/2" deep. This hole gives room for mounting the mechanism.
10. Drill a 1" hole half way through the body or as deep as the bit allows. The 1" bit is just removing bulk. Be sure to clear chips as you drill either with compressed air or by backing the bit out periodically.
11. Switch to a 1-1/6" bit and enlarge the previous hole. This is a critical hole size as the grinding mechanism mounts in this hole and you don't want a sloppy fit.  
  
NOTE: If you don't have a 1-1/16" bit you can enlarge the hole by using a skew on its side and carefully scrap the hole bigger.
12. Clean up the 1-5/8" hole by scraping with a skew. Sand, and (optional) apply sanding sealer to the bottom.
13. Reverse the blank so the bottom of the mill is in the chuck (the top of the body is now towards the tailstock).

14. True up and slightly concave the top of the body, then finish drilling the through hole in the body by using the 1" bit to remove bulk and then enlarge with the 1-1/6" bit.
15. Sand and (optional) apply sanding sealer to the top of the body. Lightly sand the through hole in the body to remove fuzzies, being careful to not change the hole diameter at either end. The body is complete.

### Prep the head

16. Mount the head in a 4-jaw chuck using the tenon that was created in step 4. The bottom of the head (where the saw marks are) should be facing the tailstock.
17. Use calipers to measure the diameter of the 1-1/16" through hole in the body (it may be different after sanding), and then set your calipers for slightly larger than this measurement.
18. *Google says the difference between a tenon and a spigot is the shape. A tenon is dovetailed and a spigot is straight.*

Turn a spigot on the bottom of the head that will fit into the body. The spigot length should be 3/8" to 1/2" long, and sized to fit the caliper diameter from step 17. Slowly reduce the spigot diameter by scraping with a skew. The spigot should fit in the body with a slightly loose fit.

19. Measure the drive plate (turn plate) diameter for your kit. Craft Supplies Artisan drive plates are 3/4" diameter and Deluxe (Chef Specialties) drive plates are 7/8"+.

For the Deluxe kit drill a 7/8" diameter hole 3/16" deep, and then enlarge the hole so the turn plate just fits.

20. Drill a 17/64" (or 9/32") hole half way through the head.
21. Slightly concave the bottom of the head. Sand the bottom but don't sand the spigot until 400 grit (you don't want to change the fit). Apply sanding sealer (optional).
22. Cut a shallow tenon in the bottom of the head so it can be reversed in the chuck.
23. Reverse the head and hold it in a Vicmarc VM100 with shark jaws or VM120 chuck with standard jaws – both of which will hold the head without damaging the spigot.
  - DO NOT grab the spigot in your jaws. If you don't have large enough jaws you can use a split ring to clamp around the spigot.

Finish drilling the 17/64" hole completely through the head.

24. Check the mill overall length before removing the tenons.

*Shape the outside of your mill.*

25. Cut a paper towel disc ("bottle cap") for the spigot to create a jam fit between the head and body.
26. Use a chuck with Extended or long nose jaws and expand the jaws into the 1-5/8" hole in the bottom of the mill. If you don't have extended jaws, make a jam chuck to fit the 1-5/8" hole. Use a cone center to support the top.
27. Mark transition points and major diameters for the body and head from your design, then use a parting tool and calipers to part down to just shy of those dimensions.
28. Use your tool of choice to turn the shape. Refine the shape and sand the body.
29. Apply finish and sign the bottom.
30. Assemble the grinding mechanism:
  - Pre-drill holes for the turn plate and grinder retaining bar screws. I use a 5/64" or 3/32" bit.

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