

Instructions for Turning a Basic Wooden Box

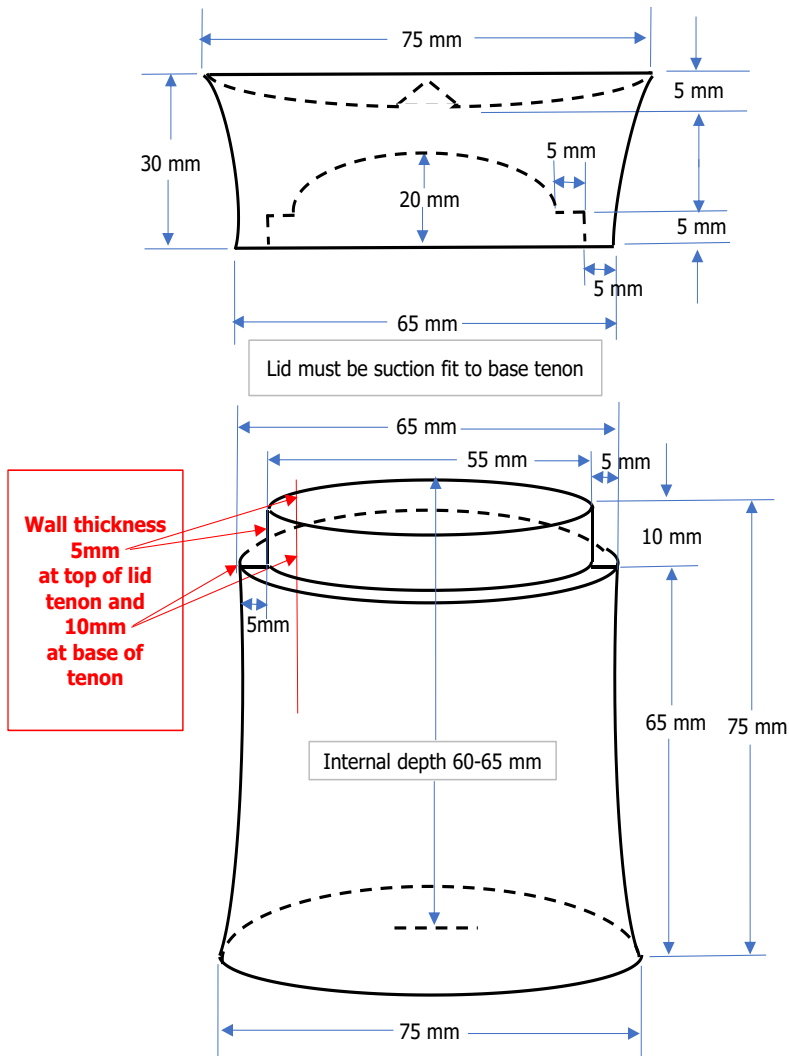
READ THE INSTRUCTIONS BEFORE YOU DO ANYTHING.

Remember

PRIOR PLANNING PREVENTS POOR PERFORMANCE



TURNING A BASIC END GRAIN WOODEN BOX



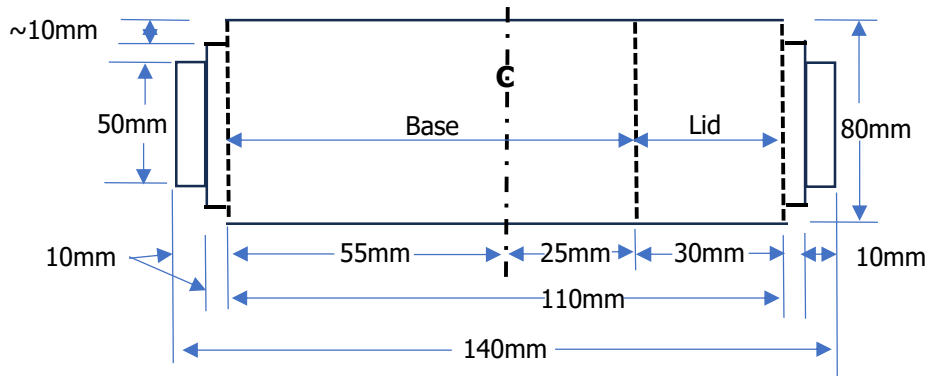
Preparing the Blank

1. For this exercise you will need a block of wood 130mm x 80mm x 80mm at a minimum. Minimum length: base 75mm + 5mm for parting tool width + 30mm lid + 20mm for tenons = 130mm.
2. Before starting make sure your chisels are sharp.
3. Find and indent the centres of each end of the block.
4. Mount a chuck to the lathe and insert a drive centre in the chuck.
5. Insert a live centre in the tail stock.
6. Mount workpiece between centres and tighten, ensuring the job is securely fixed between centres.

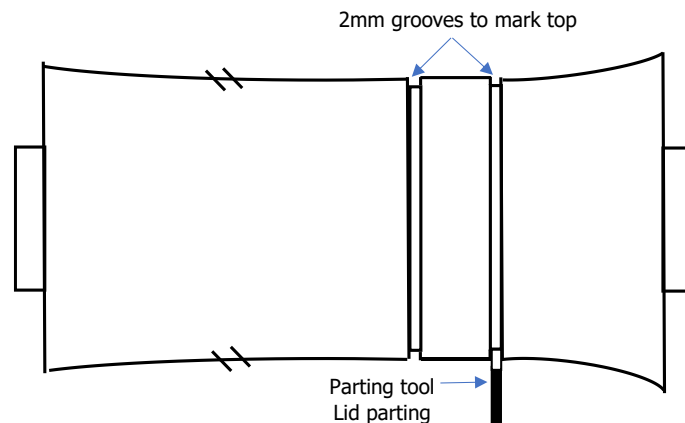
7. Using a roughing gouge turn the workpiece to around 80mm diameter.
8. Using a parting tool, or skew chisel, turn a tenon on each end of the workpiece to suit the chuck you are using – usual tenon size is approximately 50mm diameter x 10mm thick.
9. Remove the drive centre from the chuck and insert one end of the workpiece in the chuck and secure. Reinsert the live centre in the other end of the workpiece and tighten.

Turning the Outside of the Box

10. Mark the full length of the job, from the centre outwards, on the roughed-out workpiece (length of top and bottom including lid tenon provision plus 5mm for the thickness of your parting tool). See diagrams above and top of page 2 for details.



11. Use a parting tool to clearly define the top and bottom of the workpiece – a groove of approximately 10mm depth should suffice as per the diagram above.
12. Using a spindle gouge (or if your confident enough, a skew chisel) turn the outside of the box to the finish size shown in the diagram on page 1, then sand to finish.
13. Mark out the position and length of the lid tenon as per the diagram on page 1 (don't forget to add the thickness of your parting tool, i.e., 10mm + thickness of parting tool).
14. Using a parting tool, turn two shallow grooves (about 2mm deep) to mark the bottom and top of the lid tenon (length = 10mm + parting tool thickness).



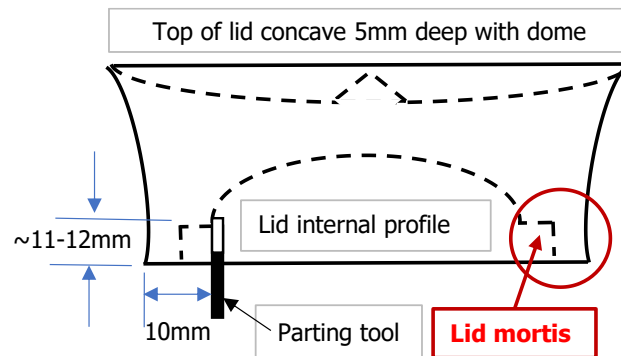
15. Part the lid from the body of the box. Remove the base from the chuck and put it to one side for later attention. **Note:** before removing the base from the chuck use a pencil to mark the location of jaw set one (1) on the tenon and the bottom of the base - chuck jaws are numbered 1 - 4 with each jaw's number clearly stamped on it and the chuck. Doing this will help you relocate the job back in its previous position in the chuck later and help resetting the base up to rotate on centre.

Turning the Lid

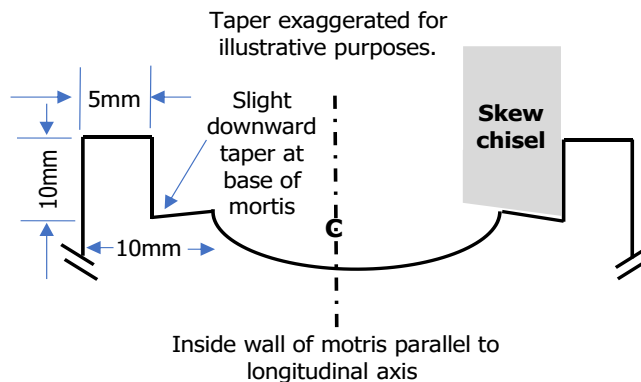
16. The lid's dimensions are detailed in the diagrams on page 1 and near the top of page 3.



17. Mount the lid in the chuck and using a pencil clearly mark a circle 10mm from the outside edge of the lid's base (bottom). This is the inner limit of the lid mortis (see diagram below).
18. Using a parting tool, cut a groove in the lid about 11-12mm deep on the inside (towards the lid's centre) of the 10mm circle for the lid's mortis. Using this groove as a guide, hollow out the lid as per the dimensions in the diagrams on pages 1 and below. Use a spindle gouge or round nose scraper to turn the inside of the lid.



19. Using a parting tool, or the long tip of a skew chisel, cut the mortis recess to the dimensions in the diagram on page 1, making sure to the inner wall of the mortis is parallel to the lid's longitudinal axis.
20. Using the long tip of a skew chisel, slightly taper the bottom of the mortis as per the diagram below. This will help ensure the lid is a neat fit with the base's tenon.



21. Sand the interior of the lid to finish, taking care not to change the mortis' profile. It may be necessary to give the inner wall of the mortis a very light touch up with the skew after sanding. Remove the lid from the chuck and mount the base back in the chuck.

Turning the Inside of the Box

22. The internal diameter of the box is in the order of 45mm with a depth of between 60-65mm. There are several ways to hollow out the body of the box, however the most common method used by those who haven't turned a box before is to use a forstner bit (45mm for this exercise) to remove the internal waste to about 10mm short of the desired depth and remove the last 10mm using a square nosed scraper, for a flatbottom, or a 13mm (1/2") round nosed scraper



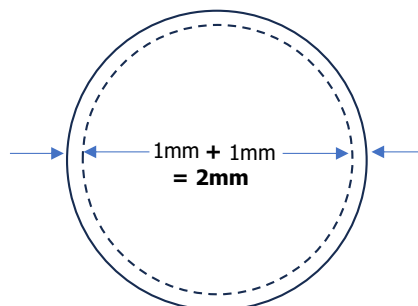
for a concave bottom. The reason for stopping the drill short of the required final depth is, essentially, to remove the dimple in the bottom left by the centre spur of the forstner bit.

If a forstner bit of the correct size is not available, select a bit close to the diameter of the inside and use it to remove the bulk of the internal waste and then use a side cutting scraper to remove the rest – using this scraper will also allow you to concave the bottom and run the curve neatly into the internal wall of the box. Alternatively, you could use a spindle or bowl gouge to clear the excess away from the wall by using a draw cut on the walls and the toe of the chisel to concave the bottom and roll it neatly into the wall.

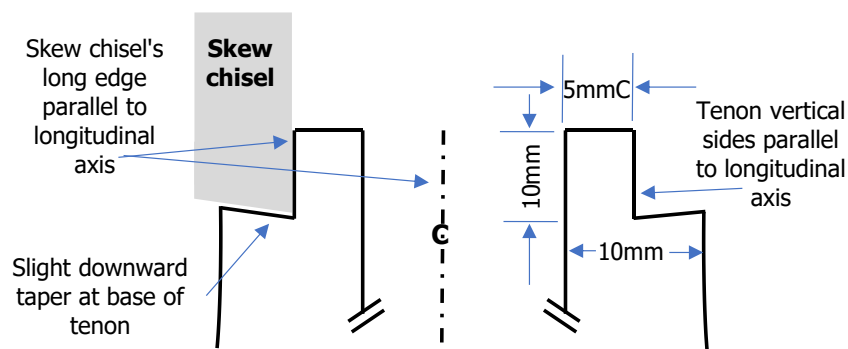


Another method is to use a parting tool to cut a groove about 20mm deep to define the thickness of the wall and then use a spindle gouge to remove excess material. Alternatively, you can use a parting tool to remove the majority of the excess internal material and then tidy it up with either a side cutting scraper or spindle gouge.

23. Using the long tip of a skew chisel, or a parting tool, slowly decrease the diameter of the tenon to accept the lid mortis. Remember that every fitting cut removes double what you think (e.g., 1mm cut actually removes 2mm from the diameter – see diagram below) – so go slowly and test after every cut by seeing if the mortis on the lid is close to a fit or a fit. Once the lid is a suction fit **LEAVE IT ALONE** – do not sandpaper otherwise the suction fit will end up a loose fit.



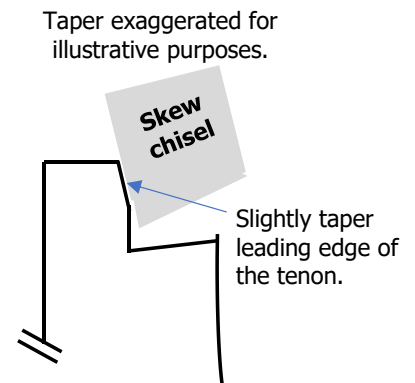
24. Using the long tip of a skew chisel, taper the base of the tenon slightly downward toward the bottom of the box. This will help ensure the lid is a neat fit. Sand the inside of the box to finish. Leave the base in the chuck.





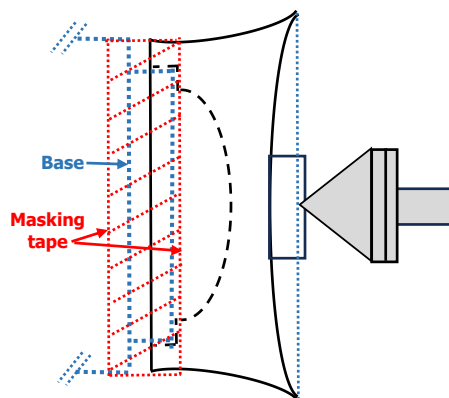
A couple of tips:

- (a) when you're getting close to the diameter of the lid's mortis make a small taper at the end of the tenon and then creep up to the fit by getting the lid to fit the taper then working the width of the taper back toward the bottom of the tenon – testing the fit as you go.
- (b) you can reverse the process order and make the base first and then the lid, making the lid to fit the base's tenon. Some people find it easier to turn a box this way.

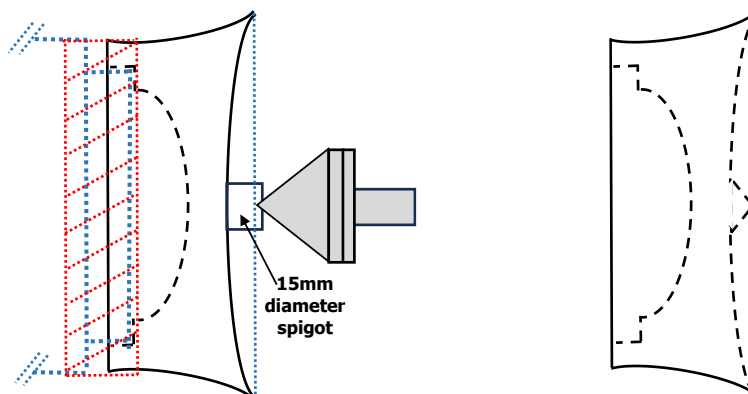


Finish turning the box

- 25. Put a conical live centre in the tailstock. Fit the lid to the base and line up the live centre with the centre on the lid's tenon, tighten the tailstock onto the workpiece and lock in position.
- 26. Sand out any surface irregularities at the junction of the base and lid.
- 27. Masking tape the base to the lid – about three/four tight wrap arounds.

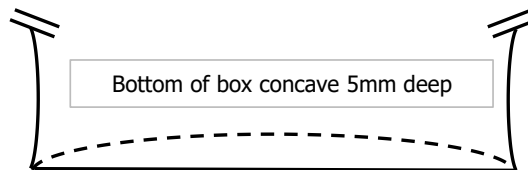


- 28. With the live centre in place, turn lid's top profile as per the dimensions in the diagram on page 2, leaving a 15mm spigot in the centre, as per the diagram below.





29. Withdraw the live centre, then using a spindle gouge turn the lid's dome. Sand to finish, remove masking tape and lid. The lid is finished ready for further sanding (if required) and the application of an oil or spray finish.
30. Remove the base from the chuck and apply about four layers of masking tape to the top (lid) tenon. The purpose of the masking tape is to protect the tenon from chuck jaw damage when the bottom is mounted in the chuck.
31. Insert the base in the chuck, lid tenon in the jaws, and lightly tighten – finger tight (**do not over tighten**). Line up the live centre with the centre on the chuck tenon on the base, tighten the tailstock onto the workpiece and lock in position.
32. Follow the same procedure used to turn the box's lid, finish as per the diagram below.



33. Sand to finish (**DO NOT** sand the lid tenon), remove base from the chuck and remove masking tape. The base is finished ready for further sanding (if required) and the application of an oil or spray finish. Your box should end up about the same size as that of box in the diagram below.

