

Fitting the Lid



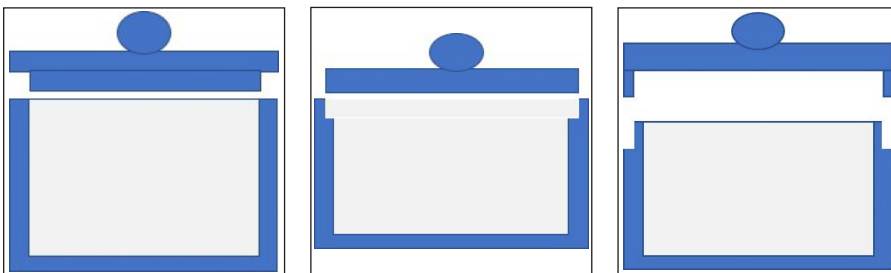
by Walt Wager

There are basically two types of box lids. Some lids fit loosely on the box so that they are easily removed with one hand, while other lids fit tightly and require that the box be held in one hand while removing the lid with the other. Loose lid boxes are containers that often sit on a horizontal surface, like a dresser or counter top, and hold objects or ingredients that can be easily accessed (**Figures 1, 2**). A tight lid secures the box's contents for small loose items; a pill box, for example, should have a Type 3 lid (**Figure 3**). Boxes with Type 3 lids can also be filled to the top and still have the top close completely.

Making Type 1 & 2 lids

Loose lids are the easiest to fit. Starting with the box itself, turn the inside edge so that it is straight and parallel to the lathe bed. I use a 1/2" (13mm) skew on its side to make a straight cut down the inside wall (**photo below, right**). When the box is hollowed to the desired depth, sand the inside and apply a finish.

It is easy to over-sand the interior rim or the edge of the lid that will meet the box. In many species, the difference in sidegrain and endgrain density leads to disproportionately removing material from two sides of the blank, creating an oval form and a poor-fitting lid.



Figures 1, 2, 3. Loose lids generally have a short tenon that fits into the opening of the box, either protruding above the sides of the box (Type 1, **left**), or flush with the box sides (Type 2, **center**). Although Type 1 and Type 2 boxes can be made with tight lids, it is more common to see Type 3 (**right**) boxes with a lid that fits snugly so that it can be carried around without falling open.



Cut the box's walls parallel with a flat-end scraper so that the lid will fit properly.

TECHNIQUE: Fitting box lids



After hollowing, sanding, and finishing the box's interior, use a Vernier caliper to measure the interior diameter.



With the lid mounted in the chuck (bottom facing the tailstock), transfer the caliper measurement to the lid. This

should be done with the lathe off, using the Vernier caliper to make two marks equidistant from the edge of the lid blank.

Turn on the lathe and use a pencil to connect the marks, making a line that represents the inside diameter of the box.



Use a parting tool to cut a tenon *almost* down to the line.



Check the fit by bringing the box up to the lid. If it doesn't fit over the tenon, use the parting tool to reduce the diameter a bit at a time until it

fits snugly. Now you need only a slight scraping cut with the parting tool to make the lid slip on and off easily.

Sand the bottom of the lid, and only lightly sand the sides of the tenon.

This same series of steps can be used with a Type 2 box lid, except that you measure the diameter of the lid with the caliper set to the inside of the mortise.



When the top fits, re-chuck the box and use it as a jam chuck to finish the top. If the top is too loose to stay on the



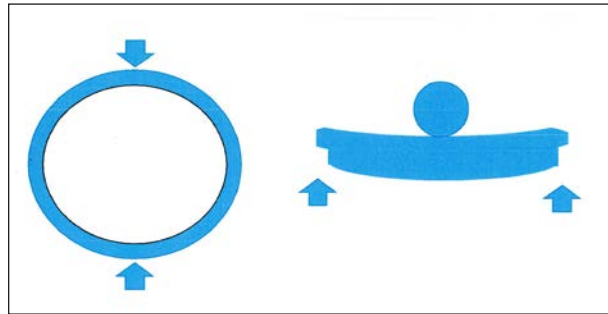
box, a piece of paper towel in the joint should snug the fit. Bring up the tailstock while turning the top of the lid.

After shaping, sand the lid and the outside of the box.



Grain orientation

Boxes can be made in endgrain orientation, aligned as if turning a spindle with the opening in the endgrain, or facegrain orientation with the opening in the sidegrain. But even if the wood is kiln dried, a facegrain box can warp into a slight oval shape, or the lid may cup slightly. The lid will fit tightly in one orientation and loosely when rotated to the other.



Making Type 3 lids

An endgrain box made with kiln dried wood is less likely to warp, but achieving a snug fit

requires sneaking up on the final cut. The next sequence of photos shows the steps I use to get a good fit.



Rough the blank between centers and put a tenon on both ends. In this case, the grain is running parallel to the lathe bed.



Determine the length of the lid, remembering that the tenon on the box will come up into the mortise on the lid. Because the lid will be grasped

to remove it, don't make it too short to grab.

If you use a thin parting tool, the grain on the side of the top and box will virtually match.



Hollow the box and use a parting tool to create the tenon at the top. Make the tenon about 3/8" (10mm) long.

Make the edge at the bottom of the tenon square (perpendicular) to the side of the box so the lid will fit squarely onto it.



Sand and finish the inside of the box. Lightly sand the tenon. For safety, the narrow interior of a box should be sanded by wrapping a piece of abrasive around a dowel, rather than sticking your fingers in the spinning blank.

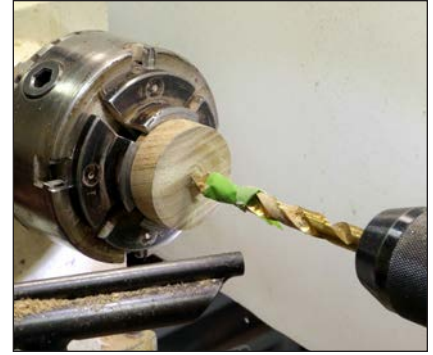
TECHNIQUE: Fitting box lids



Remove the box from the chuck.

Measure the length of the tenon and mark it with tape on a 3/8" drill bit.

Mount the lid in the chuck and drill a hole to the depth of the tenon.



Measure the outside of the tenon with a Vernier caliper.

Transfer that measure to the lid blank.



Remove the wood from the center of the lid working from the hole in the center to just shy of the caliper line. Here I use a 3/8" spindle gouge.

Cut the inside of the lid to about 1/8" (3mm) deep and shy of the mark from the caliper. The purpose of the shallow cut is to have a place to test fit the tenon before hollowing the lid to its final depth.



Cut a slight taper in the lid from the mark left by the caliper to the bottom of the 1/8" hole.

Check the fit again. If the tenon doesn't fit into the hollow in the lid, take another thin cut on the taper.

Check the fit. The tenon on the box should begin to fit into the tapered hole in the lid. Note where the outside edge of the box's tenon hits the inside of the lid. Twisting the box often leaves a mark on the inside of the lid. Widen the 1/8" inch deep mortise until the tenon on the box fits snugly.

Test to see if the tenon fits into the hollow you just cut in the lid. If you stopped short of the caliper line, it should not fit yet.



TECHNIQUE: Fitting box lids



Finish hollowing the lid to the depth of the drilled hole. Use a parting tool to square the mortise to the final depth. Sand the inside of the lid but don't sand the sides of the mortise unless the fit to the box is too tight. Just a little sanding with 240- or 320-grit sandpaper can change the fit of the lid to the box.



The box should fit snugly onto the lid and the edges meet squarely (note the joint faintly visible as a pencil line near the jaws). A bit of wax can be applied to the tenon and the inside of the lid but do not sand the tenon or the lid unless it is too tight to remove easily. If the lid will not pull straight off, twist it as you pull it apart.



Re-chuck the box and use it as a jam chuck to hold the lid. Finish turning the top of the lid. To finish the bottom of the box, reverse its orientation on the lathe and gently clamp the tenon on the top of the box in the scroll chuck. If you are concerned about marring the tenon, wrap a layer of shop towel around it before snugging the chuck jaws. Bring up the tailstock and engage the live center. Take light cuts to remove the bottom tenon, and finish the bottom.



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