



BENTWOOD BOX

Bentwood box production is a highly specialized and highly skilled trade: making the box takes quite some time to master. These boxes are made from a single plank of wood, often red cedar, yellow cedar, or even yew. Three kerf cuts are carved into the wood and then it is steam bent to create the box. The last corner is tied with sinew or pegged to join the intersecting boards.

Bentwood boxes were found up and down the coast of British Columbia. They were used for cooking, storage, and storing valuable personal belongings.

This project teaches use of knives, power tools and a traditional knowledge of bending.

Materials

- Clear Red or Yellow Cedar planks
 - Sides ($\frac{1}{2}$ " x 7" x 24")
 - Top ($1 \frac{5}{8}$ " x 7" x 7")
 - Bottom ($\frac{1}{2}$ " x 77")

Supplies

- Old tarp or canvas
- Waterproof glue
- 80-, 150- and 180-grit sandpaper

Tools

- Table saw with $\frac{1}{2}$ " dado blade or a router with a straight
- Bent knife
- Ratcheting clamps
- Palm sander
- Steam generator

Safety

- Eye protection
- Ear protection
- Leather gloves
- Dust masks or respirators

Procedure

One of the key aspects in bentwood box making is the kerf cut. The kerf cut is the width of the cut in the wood, made by the saw blade. The kerf is cut across the width of the board. In the case of this Bentwood box project the kerf cut is $\frac{1}{2}$ " in width. Using a $\frac{1}{2}$ " dado blade would be ideal for this procedure. The depth of the kerf cut is essential leaving only about $\frac{1}{16}$ " - $\frac{1}{8}$ " of the thickness. This will allow the board to be bent once it is steamed. Using $\frac{1}{2}$ " stock, set the depth of the cut at $\frac{3}{8}$ ".

1. Set up your table saw with a $\frac{1}{2}$ " dado blade.
2. Measure your first cut at $5\frac{1}{2}$ " and run the plank over the dado blade, cutting across the width of the board. Measure $5\frac{1}{2}$ " from the first cut to begin the second. Repeat the $5\frac{1}{2}$ " measurement for the third and fourth cuts. The last cut will be right at the edge at the end of the board as shown in the diagram below.
3. Using a bent knife, you will need to do an undercut on the bottom of 3 of the kerf cuts. The undercut measure $\frac{3}{16}$ " as shown on the photo below. The last kerf cut at the edge of the plank is not undercut.

This will take some practice with the bent knife and running along the length of the kerf. Ensure your knife is sharp to make a clean cut. For best results, the cleaner the cuts and kerfs will ensure a proper bend.

4. Set up the steamer in a well-lit and open space. Have an old tarp or piece of canvas to place over the wood when steaming. Place the kerfed plank onto a table and wrap the tarp or canvas around it. Insert the hose into the canvas directly onto the wood. Let it steam for 20-25 minutes.
5. Using leather gloves unwrap the plank and bend immediately. Laying the box on a hard surface like a desk, grasp the plank with both hands and start from one side and roll it into a square. The corners should bend nicely as the wood has been softened by the steam. Apply force as necessary to set the corners snugly together. Holding in one hand, wrap an old tire tube (as a clamp) around the box to let it dry and release the steam.
6. Once it is dry you can add glue to the kerf cut where the ends come to meet. Clamp it into place and let it dry.
7. You may notice that there are frayed pieces where the steamed corners are. This is normal and can smooth with a palm sander. Larger frayed corners may need a knife and sandpaper to fix.
8. Cut and fit a bottom flush with the box.

TIP: Before you attach the bottom to the box, place the box on the lid (centered) and trace the inside. This will give you the dimensions of the inset of your lid.

Glue and clamp your bottom to the box. Wipe off excess glue with a damp cloth. Gluing and clamp times will vary for different types of glues. Read the label on the glue bottle. Typically, yellow wood glue sets up quicker with little clamping time required. If more time is required to set up and clamp, use white glue.



9. Cut and fit a top for the box. The top has an overhang of $\frac{1}{4}$ " on all sides of the box with a slight angle of 6 degrees as shown in the diagram above. It will have an inset of $\frac{3}{16}$ " deep into the box.
Measure the top of the box and cut a piece of wood that is $1\frac{5}{8}$ " thick. I find tracing onto the lid while the box is upside down is a good way to start my measurements. Add $\frac{1}{2}$ " to the width and length, to allow for a $\frac{1}{4}$ " overhang on all sides. Mark one corner as a reference point for later fitting of the top. Set-up your table saw with a blade at 6 degrees and cut the lids to the determined measurements.
10. To make the inset for the lid, measure the distance to the inside measured line, (the one you traced earlier), and set-up your table saw to cut to that line. The depth of your blade is $\frac{3}{16}$ ". Make all 4 four cuts - you can use a dado blade to remove the material quickly and then a chisel to remove the rest of the material.
11. Finally, sand the entire outside of the box - start with 100-grit and finish with 220-grit.
12. You can paint on a design or just oil to finish.

A large majority of the boxes had painted designs on them and were left natural, or no oil. The choice is yours.