

Bear's Stacked-blank Bowls Demo

Tools required:

Basic shop tools, including:

- Saw. Band saw is ideal, but a sabre saw would suffice.
- Planing device. A thickness planer is ideal, but a hand plane, or even a belt sander, with 80 grit belt, will do the job.

Lathe tools:

- Scroll chuck with ~2" jaws
- Screw chuck, screw adapter for scroll chuck. A small (~3") faceplate might suffice, depending on your layout.
- Bowl gouge(s), as desired.
- Scraper(s), as desired.
- Thickness calipers.
- McNaughton system with straight blade, or the "Slicer" with handle for the Stewart or Sorby RS-2000 system, or a 3/16" to 1/4" diamond parting tool.

Miscellaneous:

- Sandpaper in various grits.
- Wood glue. Preferably Titebond original, but other strong, long-set glues would do.
- Ruler, protractor, pencil, and paper.
- Adjustable bevel gauge.

Procedure:

Prepare blank

The selected blank **MUST** be dry, and should be acclimatized to the shop prior to starting. Wet wood blank will move, causing glue joints to fail. If the joints fail afterwards, it would be very disappointing. If they fail while turning, it could be extremely dangerous!

1. Plane blank so that it has a uniform thickness with smooth and parallel faces, and no finish or sealer residue on either face.
2. Cut blank to circular or octagonal shape.

STOP! Put the tools down. Measure the final thickness and diameter of the blank.

Layout cuts

3. Make a full size drawing of the rectangular cross-section of the blank.

4. Draw in the recess area for your scroll chuck jaws, and sketch in the hole for the screw chuck, or holes for faceplate screws. See Figure 1.

To maximize support, you can use a faux recess/spigot as shown in Figure 1. This entails cutting a recess slightly larger than the chuck jaws, with a dovetailed spigot in the center, sized so that the chuck jaws can grip it.

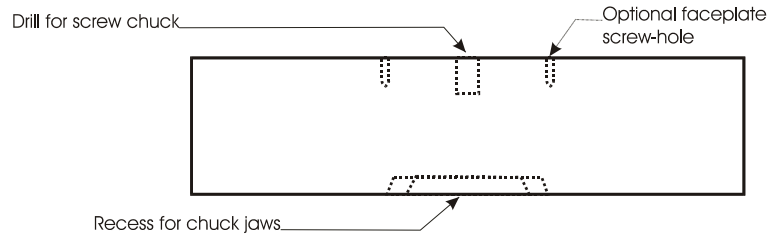


Figure 1: Screw-chuck hole and scroll chuck recess

5. Figure the cuts for the conical cross-sections to be cut, and draw them on the paper.
 - a. If planning on using your chuck in expansion mode into the recess, be sure to allow for sufficient support.
 - b. Be certain that the smallest diameter of the outer ring overlaps the largest diameter of the next inner ring by at least 3/8".
 - c. Remember to account for the width of the cut made by the parting tool. Figure the width of the tool, plus about 1/32" for clearance. For example, if the tool is 1/4" wide, allow for 5/32" cut width.
 - d. Mark the largest diameter of each cut towards the face with the screw-chuck hole or faceplate holes.
 - e. Make sure that all cuts will clear any screw holes, and the chuck recess/spigot.
 - f. The outside ring may be used for a round picture frame. Cut an additional rebate about 1/4" deep before cutting the ring. See Figure 2.

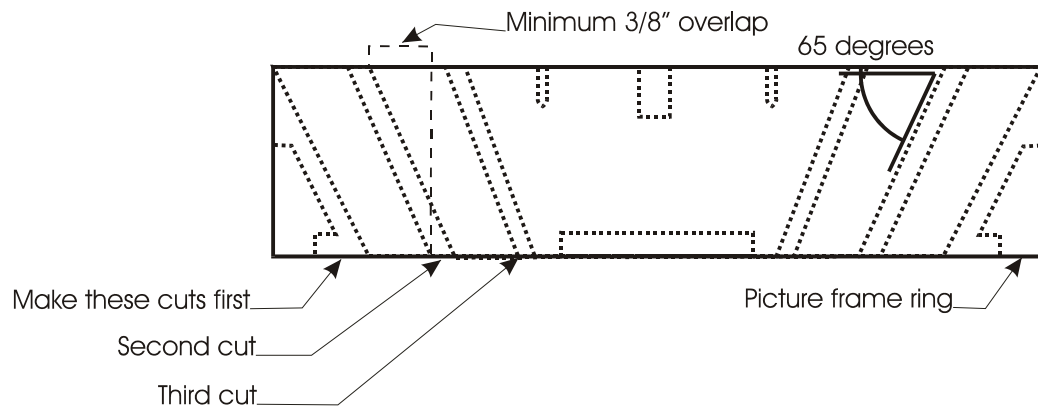


Figure 2: Sample drawing for 8" by 2" blank, with three sections.

Test Layout

6. Duplicate the drawing, and cut the paper following the lines you've drawn. Make sure that they stack as desired. Tape the sections together. It is far cheaper to make a mistake on your paper pattern than on your wood! See Figure 3 on page 3.

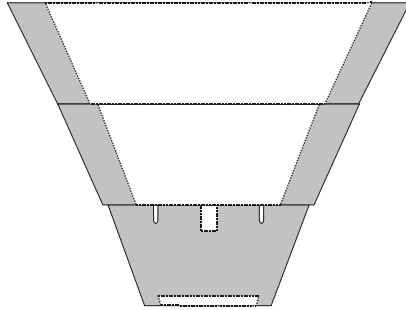


Figure 3: Sample layout for three-section blank

7. Take a second sheet of paper, and mark the outline of your taped paper sections. Sketch in your final desired shape, based on the wood available. If desired, fold the paper in half along the center axis, and cut out to see the final profile. See Figure 4.

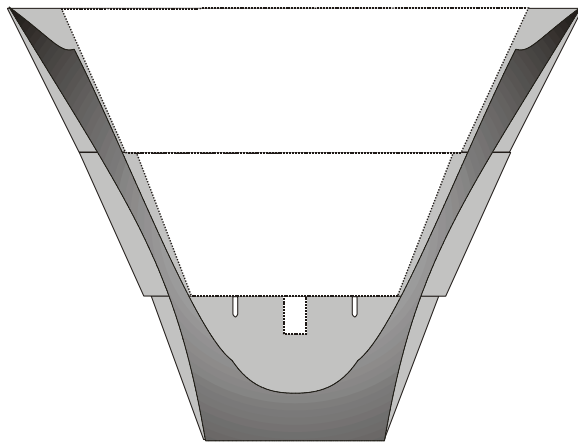


Figure 4: Three-section sample bowl design

Figure 5 illustrates an alternative pattern, using only two sections, and allowing for a rounder form. An additional cut can be made while the piece is still on the screw-chuck, yielding the small bowl shown in the lower right corner of the diagram.

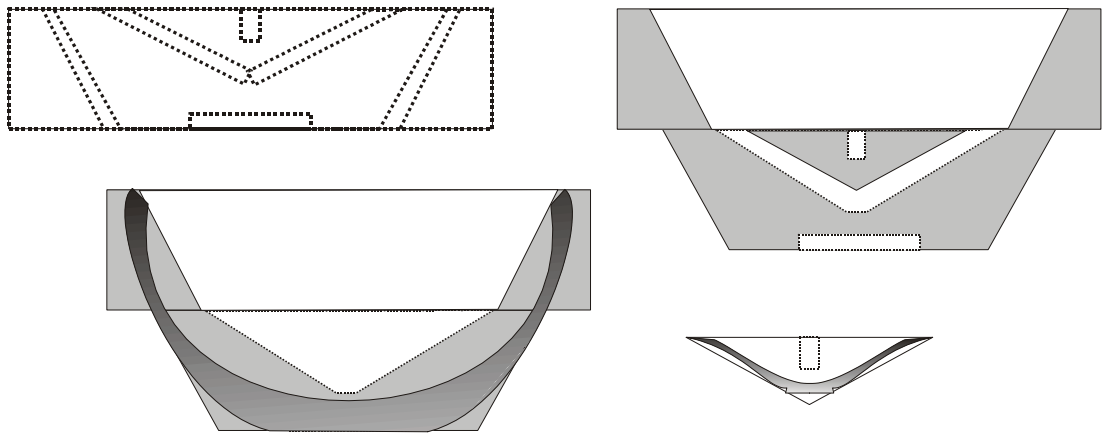


Figure 5: Alternate two-section bowl layout

Mark and Cut Blank

When you've determined the final outline, go back to the shop and proceed.

8. Mark and drill center hole for screw chuck, and attach to chuck. Or mark and attach to faceplate.

Note: The more accurately the piece is mounted now, the better the end result will be!

9. Adjust the toolrest, turn on the lathe, and true the edge of the blank.
10. Mark the cuts on the work piece face that is away from the headstock. See Figure 6.
11. Mark a broad, straight line from the center to the outside edge of the work piece. This will be used to line up the piece during glue-up.

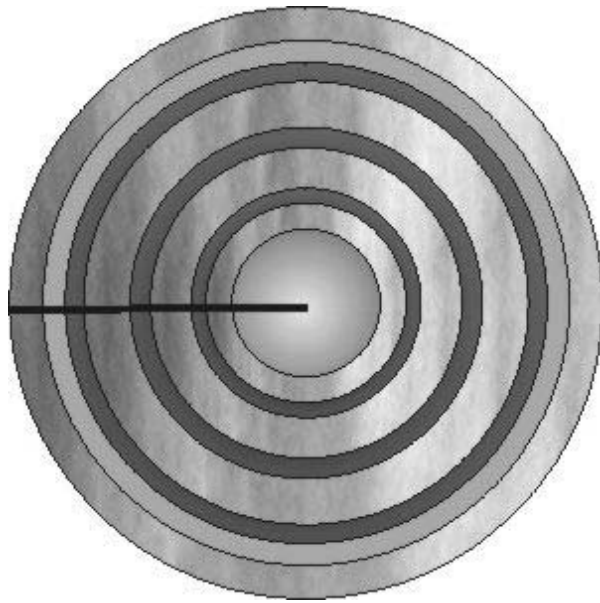


Figure 6: Cuts marked on bottom face

12. Cut, decorate, and sand the recess/spigot for the scroll chuck.
13. If desired, cut picture rebate just outside the outermost ring. The rebate should be about 1/4" deep and wide, extending towards the outside from the outermost marked parting cut.

The ring cuts can be made using several different methods. You could use a diamond-profile parting tool. This might work, but it could get really grabby towards the end of the cut. The "Slicer" from the Stewart or Sorby systems would also work. The armbrace handle would counteract the pull on the end of the tool. Both of these methods employ manual control over the angle of the cut.

The McNaughton system straight blade works very well for this. The blade is designed to make deep cuts. The special toolrest gives great control, and the angle can be quite easily controlled. I personally use the "small" set, which is available in the U.S.A. only from Kelton distributor Greg Jensen (513 702 7316, or email: gnjensen@fuse.net).

Note: You must start with the cuts farthest from the center and work inward, as shown in Figure 2 on page 2.

14. With the lathe OFF, set the toolrest and the angle of the blade.
 - a. For the McNaughton system:
 - 1) Set adjustable bevel gauge to angle indicated on drawing.
 - 2) Place the special toolrest in the banjo, and adjust the height per manufacturer directions.
 - 3) Set the blade (without handle attached) into the rest and move rest close to blank.
 - 4) Hold tool against both posts on toolrest, adjust angle with bevel gauge, and move banjo so that the blade is aligned with the outermost marked cut line.
 - b. For the “Slicer” or parting tool:
 - 1) Tape a copy of your initial layout drawing (see Figure 2 on page 2) on the toolrest. Make sure the toolrest is parallel to the work piece, and that the drawing is centered to the work piece.
 - 2) Use the lines on the drawing to align the tool to the proper angle
15. Tighten toolrest, attach handle (if required), and proceed with the outermost cut.
16. As you get close to the completion of the parting cut, gently support the ring with your left hand. When the cut completes, turn off the lathe, move the toolrest back, and remove the ring.

Caution: Be careful of any sharp edges that probably are on the corners of the cut.

17. Re-adjust toolrest and make subsequent cuts, and set aside rings.
18. Remove center from screw chuck or faceplate.

Glue-up

I use Titebond original for gluing most laminations. Most of the turners doing segmented pieces say that the Titebond II tends to have a high rate of joint failure, and may creep (move) after finishing. A slow-set epoxy or polyurethane would work, but might leave very visible joints in the finished work. A fairly slow set time is required.

19. Spread a liberal amount of glue on the smallest face of the largest ring.
20. Press the largest face of the next smaller ring into the wet glue. Slide the pieces together to spread the glue thoroughly. Make sure that the line drawn in step 11 (see page 4) is aligned as closely as possible and that the rings are centered on each other (otherwise, the wall thickness of the piece will be compromised). This will ensure that the grain is well-aligned.
21. Repeat for subsequent rings.
22. Set on table or bench with the largest ring down.
23. Weight or clamp the piece.
24. Re-check the alignment, and leave to dry overnight.

Turn

25. Mount the glued-up blank to the scroll chuck.
26. Move the tailstock with a live center up and apply moderate pressure while turning the outside.
27. With lathe OFF, adjust toolrest to turn outside profile. Check clearance before turning on lathe.
28. Smooth the joint lines into a fairly smooth line.
29. Shape to final form. Try for a smooth-flowing curve.

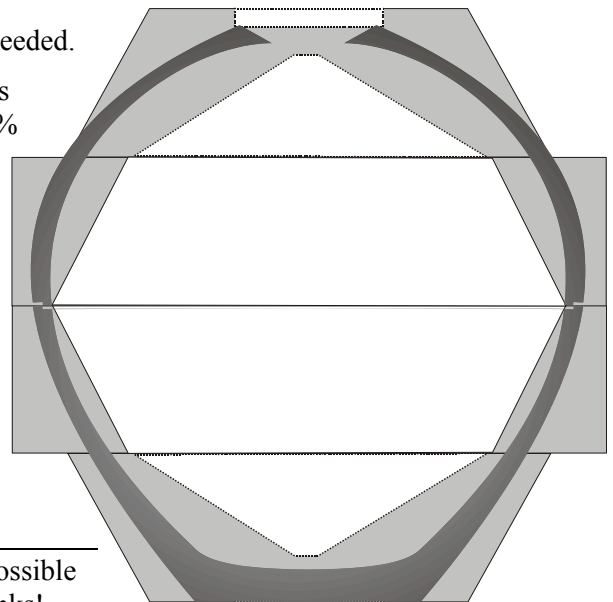
Caution: Take great care not to thin the walls too much. There is little room for error!

30. Move toolrest aside, and sand as needed.
31. With tailstock still in place and lathe OFF, adjust toolrest to the end (tailstock side) of work piece.
32. Carefully turn off any internal burrs and edges, and shape rim.
33. Smooth as much as possible of the inside of the work piece with tailstock in place.
34. With lathe OFF, remove tailstock.
35. Readjust toolrest, and finish turning the walls of the bowl. Complete the wall turning in stages, starting from the top edge back towards the bottom. If you thin the lower walls first, there may not be enough support to turn the top edge.

Check the thickness often to avoid getting too thin. Because of the glue joints, I find that about 1/4" is the thinnest safe wall thickness.

36. Hollow bottom of bowl, and blend into edge curve. Because of the height of this piece, relative to its base diameter, I try to leave a fair amount of wood in the base, to help balance the finished piece.
37. Move toolrest aside, and sand interior as needed.
38. Finish piece. One of my favorite finishes is Deft semi-gloss lacquer, thinned about 50% with lacquer thinner.

- a. Brush the lacquer on liberally.
- b. While still wet, wipe with a paper towel.
- c. Turn lathe on and buff the lacquer dry with the paper towel.
- d. Repeat steps a-c.
- e. With lathe on, rub on beeswax, and buff to a rich glow.



The figure above right shows a theoretically possible hollow form using this technique, and two blanks!
