

Bowl 101

7/8/23

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1. **Stuff to think about for bowl turning.** There is no particular order to the following:
 - a. The Wood
 - b. The purpose or use for the bowl and the finish for the bowl
 - c. Mounting the blank
 - d. Tools
 - e. Lathe
 - f. The bowl designs
 - g. Sanding
 - h. Signing your work

2. **The Wood** - Most of us are not turning a set of bowls, most of us are turning one off items for the joy we get from turning.
 - a. Wood vs. bowl design
 - i. You know what you want to make but you have to get the wood.
 - ii. You have a piece of wood and you want to know what to make out of it.
 - b. Green wood, Air dried wood and Kiln dried wood
 - i. Green Wood is considered by me to be wood that has leaves that are still green. The moisture content of green wood is above 60%, this moisture content is relative to wood that is in equilibrium with the air (EMC).
 - ii. Air dried wood. If you take a 1" board of green wood and air dry it for 1 year you will have a board that is in equilibrium with its surroundings or an air-dried board (EMC.) In Florida this is around 14% while in Arizona it is around 8%.
 - iii. Kiln dried wood is wood that has been dried in a kiln and has a moisture content of between 8 and 12%. This is "furniture grade" wood. Drying wood in a kiln is much faster than the year it takes in Arizona to dry to 8%!

3. **The purpose or use for the bowl and the bowl finishes**
 - a. Dry bowl – This type of bowl can have any finish that you want to use.
 - i. A display piece should have a "museum quality finish," it cannot have any visual flaws. This is achieved by sanding through the grits to 800 grit, before applying any finish.
 - ii. The finish you apply will determine how you will have to finish the finish.
 1. Lacquer can be built up layer after layer without the need to sand between coats because the solvent for the lacquer fuses with the preceding coat of lacquer.
 2. Urethane must be dry between coats and sanded to provide "tooth" for the next layer to stick to.

3. Enough coats of either must be applied so that you do not sand through the finish when “finishing the finish.” If you sand through the finish then you must remove all of the finish and start over again.
 4. Penetrating cyanoacrylate finishes, such as Parfix 3408, really don’t need more than 1 coat. To finish this type of finish a buffing wheel with compound can be used. If your wood has open grain then the buffing compound should be selected to match the color of the wood because once it gets into the grain you will not be able to get it out! Walnut with white speckles is not “museum” quality!
- iii. The finish should be finished by wet sanding through 1500 grit or higher.
 - iv. If you want a high gloss on your finish then polish your finish, by hand, with automotive rubbing compound. You can get this at most auto parts stores, read the label it should say that it is for removing the scratches from 1500 grit sandpaper from the automotive finish. On open grain wood like oak or purple heart you must put enough finish on the surface to completely fill the “open” part of the grain. Nothing is worse than spending all that time to get the perfect finish and have spots of rubbing compound all over your finished piece.
 - v. If you do not desire a high gloss then cut back the gloss with 0000 steel wool.
- b. Wet bowl – This type of bowl needs to have a finish that is impervious to moisture.
- i. I think that all finishes are “food safe” but a bowl that is to be used for wet stuff like a salad bowl needs to have a moisture barrier between the contents of the bowl when in use and the wood.
 - ii. This can be achieved with non hardening oils like mineral oil or walnut oil.
 - iii. It can be achieved with hardening wax oils such as Odie’s oil or Rubio Monocoat.
 - iv. It can be achieved with a finish that includes bee’s wax.
 - v. A clear epoxy finish can also be used but should be limited to items that will not be marred by utensils. I have used this for beer glasses to great effect.
 - vi. For use bowls need to be cared for with some degree of common sense.
 1. They cannot be immersed in water or put in a dishwasher.
 2. They should be cleaned by rinsing and then a brief use of a soapy dishrag followed by a rinse and then dried immediately.
 3. Their finish needs to be renewed by a re-application of finish after some amount of time.

4. Mounting the blank

- a. Faceplate – A faceplate is usually a steel device that threads on to the lathe spindle and it has a flange with holes to accept screws.

- i. Never use hardened steel screws, like drywall screws, to fasten the wood to the faceplate because they may break due to the side loading when turning.
 - ii. Sheetmetal screws are acceptable to mount the wood to the faceplate.
- b. A wormwood screw – A steel coarse thread screw, usually 3/8" diameter, that is gripped by your chuck and then threaded into a hole in your blank.
- c. A 4-jaw chuck – A chuck is, in my opinion, the best way to mount the wood on the lathe.
 - i. Chucks come in many sizes.
 - ii. Some have inserts to adapt the chuck to many different lathe spindles.
- d. Waste block glued to the blank using a piece of kraft paper between the waste block and the blank for easy removal or glued directly to the blank. This can be mounted to the lathe using any of the above methods.

5. Mounting the blank to finish the bottom or the bowl

- a. Cole Jaws or Longworth Chuck can be used to re-chuck the bowl when the bowl tapers away from the jaws so that they will grip the bowl. Extreme care must be taken when using this type of chuck because you really cannot put much pressure on the bowl and a "catch" will launch your bowl into something hard and jagged and it may even find some wet paint to roll around in!
- b. A soft cushioned face plate like a plywood faceplate with carpet padding glued to it can be used with the tail stock and you can finish most of the bottom and then carve and sand off the "nub" that is left.
- c. A vacuum chuck is also a good way to finish the bottom, it is relatively safe but expensive and won't work with wood with through holes in it.
- d. For natural edge bowls or bowls with through holes a "goinda" can be used. A goinda is any old piece of wood that is held by the chuck jaws and is long enough to reach the bottom of the bowl. The face has been turned to support the base of the bowl, that is a rounded edge is turned that fits the curvature of your bowl where it contacts the bowl. Some type of padding is used between the bowl and the "goinda."
- e. A faceplate made from a sink cutout, Formica covered plywood with a hardwood tendon screwed and glued on the back side, can be used along with hot glue to mount the unfinished bowl. First use masking tape, wrapped counter clockwise, around the rim of the bowl and folded over. Then, using the center mark on the tendon, hold the unfinished bowl against the Formica side of the faceplate, making sure that it runs true. Then put a small bead of hot glue on the junction between the faceplate and the masking tape covered side of the bowl. Once the hot glue cools off you will be able to finish the bottom of the bowl. Leave the tailstock in place for as long as you can then take it away and finish the bottom. Then sand through the grits as you did on the rest of the bowl.

6. Tools

- a. The bowl gouge is the tool that should be used for 99% of bowl turning.

- i. 5/8" for most of the work while 1/2" for fine and or finish cuts.
 - ii. Fingernail grind gouges need to be sharpened on a compound jig such as a Wolverine with the Vari-Grind jig. The use of a jig will ensure that you have a uniform, single facet grind that is repeatable.
 - iii. English grind bowl gouges can be sharpened using the Wolverine alone by placing the butt end of the gouge into the "V" arm.
 - iv. Whenever setting up to sharpen it is important to use the "Sharpie Pen" method. Color the bevel of the gouge, set the angle and then by rotating the grinding wheel backwards by hand touch the colored portion of the bevel lightly onto the wheel. Look at the mark where the wheel took the ink off of the bevel, if the mark is at the top then you need to move the "V" in a little, if at the bottom then the "V" arm needs to be moved out a little. Then repeat until the scratch in the ink goes from the cutting edge to the heel of the bevel.
- b. Spindle detail gouges can be used to make small decorative cuts and to finish up the bottoms of bowls.
 - c. All tools have to be maintained sharp either with the use of the grinder or diamond hone between sharpening with the grinder.

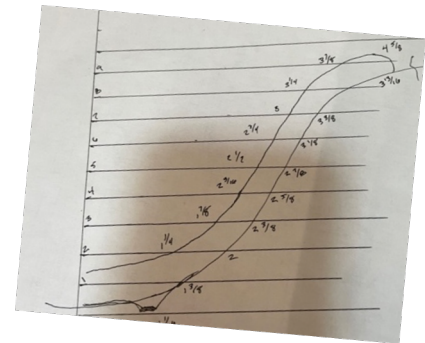
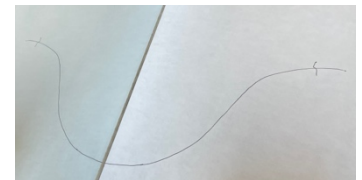
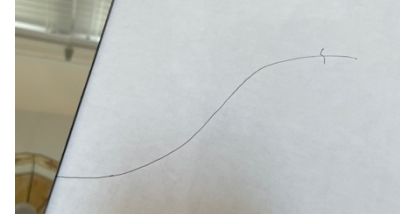
7. Lathe

- a. Use the one you have.
 - i. If you don't have a lathe or a friend with a lathe then consider purchasing a lathe. Join your local woodturners club. You can find your local chapter by contacting the American Association of Woodturners at: <https://www.woodturner.org/Woodturner/AAWConnects/AAW-Connects.aspx>
 - ii. While you are on the AAW site, consider joining the AAW. The magazine you get 6 times a year is worth way more than the cost of joining up.
 - iii. Once you are a member of the local chapter make sure to subscribe to their newsletter and to ask if anyone has a lathe for sale.
 - iv. Buy the biggest most expensive lathe you can manage and grow into it. If you start small and cheap then you will outgrow the lathe quickly and do a sell/buy another lathe and by the time you get to where you should have started you will have spent twice as much money than you would have spent if you would have started with the big expensive one!
- b. The size of the bowl is limited by the capacity of the lathe.
- c. More horsepower makes for easier turning.
- d. Variable speed saves lots of headaches.
- e. The tool rest needs to be free of nicks and rust, the bowl gouge should be able to slide over the tool rest with ease and without "bumps."
- f. Keep the tailstock engaged for as long as you can.

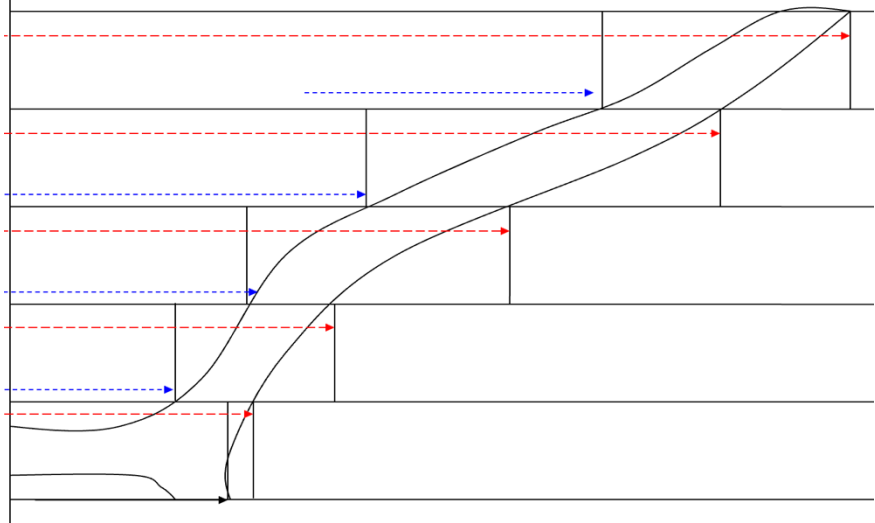
8. Bowl design

- a. You already have a bowl design, i.e., your customer has asked for a particular size and shape.
- b. You are making a bowl for yourself.
 - i. You already have a piece of wood and would like to use it to make a bowl.
 - ii. You are shopping at your favorite wood emporium and purchase a blank so that puts you back at i. above.
- c. Draw your design full size. An 8 ½ by 11-inch sheet of typing paper will allow you to draw a bowl that is 22 inches in diameter and 8 ½ inches tall. This is a BIG bowl and beyond the capacity of most lathes.

- i. Start by putting your paper on a good surface like a desk top or table top.
- ii. Draw a rough outline of the cross section of half of the bowl.
- iii. I use a mirror tile, available at the big box store where they sell wall tile.
- iv. Place the mirror on the paper such that the bottom of the bowl rough outline is near it.
- v. By looking into the mirror, you will be able to see what the rough outline will look like as an entire rough outline of the bowl.
- vi. Now by changing the angle of the mirror relative to the rough outline you will be able to see the rough outline with either steeper or shallower sides.
- vii. When the reflection looks “right” mark along the intersection of the mirror and paper to make a centerline relative to the rough outline.
- viii. Make lines at 90° to the mirror centerline at equal distances from the bottom of the rough outline to the top.
- ix. Go over the rough outline and make corrections as necessary and draw the shape of the inside and outside of the bowl.
- x. Inspect what you have drawn and make any additional corrections.
- xi. Put in measurements.
 1. Since this half drawing is full size a simple ruler will allow you to measure distances from the centerline to the inside and outside of the bowl at those intervals that you have made.



2. Remember that the distances will be “radii” and not diameter; so, if you measure from the centerline to the outside line at the top you will have to multiply by 2 to get the designed diameter at that point.
3. In this design the red dashed lines represent the outside diameter



at those locations and the blue dashed lines represent the inside diameter at those locations.

4. I have included vertical lines to indicate those locations.
- d. While this is a good exercise to finalize a design, I know that this will not be followed more than once by anyone but it is a good tool if you cannot get a design in your head.

9. On to turning

- a. You need to have turning tools, the basic minimum needed is 5 tools.
 - i. Bowl Gouge
 - ii. Small Spindle Detail Gouge
 - iii. Parting Tool
 - iv. Round Nose Scraper and a method to burnish a hook on the scraper (<https://www.fine-tools.com/G307858.html>)
 - v. Spindle Roughing Gouge (never used on bowls!)
 - vi. Skew Chisel (never used on bowls!)
- b. You will need to have lathe accessories.
 - i. Drive Center
 - ii. Live Center
 - iii. Faceplate
 - iv. Chuck
 - v. Tool rest with hardened steel rod on the top for the tool to ride on.
 - vi. Adequate lighting both for outside of the bowl and inside of the bowl (<http://www.cindydrozda.com/html/Microlight.html>)

c. Mounting the turning blank.

(Note) This may sound easy but it is the most critical to get right the first time. Some methods are fairly straight forward like starting with a round blank from the store, all you have to do is find the center, jamb it against the chuck jaws or face plate and turn a tendon and it is ready to mount in the chuck. *Not so fast hotrod*, look at your chuck jaws they either have a tooth at the top of each jaw, are dove tailed or are serrated. If they are straight walled, they are not for bowls. I don't use the serrated, they were designed to grip square stock. I use either the ones with the tooth (Nova) or dove tail. I most always grip on the outside of the tendon because if you grip on the inside of a recess vs a tendon you are trying to force the wood apart and so is the lathe via centripetal force. So, to grip on the outside of the tendon you must make it to match the jaws and the diameter should be such that when the jaws are engaged on your tendon the inside of the jaws are touching the tendon all the way around.

i. Turning a tendon for the chuck jaws on a round or square blank (purchased blank.)

1. Mark the center of the blank, center finder for round or cross lines for square.
2. With the chuck attached to the headstock capture the blank between the top of the chuck jaws and the tailstock making sure to have the live center in the marked center of the blank.
3. Flatten an area on the blank that is bigger than the size needed for the jaws.
4. Mark the proper diameter of the tendon for the jaws being used.
5. Turn down an area to create the tendon that is about $\frac{1}{4}$ inch or so. The tendon should never touch the bottom of the chuck jaws.
6. Make the blank side of the area turned down angled inward (toward the headstock) a degree or so. This makes the outside of the face of the jaws touch.
7. Either turn the tendon to match dovetail jaws or put a small notch in the base of the tendon to match the Nova jaws.
8. The final cuts to make the tendon can be done with the spindle detail gouge.
9. Release the blank and reverse it into the chuck jaws.
10. Tighten the chuck making sure that the faces of the jaws are in contact with the blank.



11. Bring the tailstock up and repeat the above steps and make a tendon on the other side of the blank.
- d. Mounting an odd shaped turning blank
- i. Some turning blanks are not either round or square they are just chunks of wood.
 - ii. Half logs should be hung between points.
 1. If you have 2 live centers that is the ideal way to hang the blank, otherwise you will have to hang it from the center of the drive spur and the live center.
 2. Keep moving the points into the wood till the wood doesn't have a heavy side, it is statically balanced.
 3. Mark the 2 center points then turn the 2 tendons.
 - iii. Other odd shaped pieces.
 1. These type of "chunks" of wood need to be positioned between 2 points and balanced as in ii.2 above.
 - iv. Limb crotches
 1. These types of blanks, used for wing bowls, may need to be trimmed to make balancing possible.
 2. Get the "Y" centered as near as you can then find the shortest limb and mark the other 2 to the same length and trim those longer portions.
 3. These type of "chunks" of wood need to be positioned between 2 points and balanced as in ii.2 above.
- e. Turning the bottom of the bowl.
- i. If you have the drawing that you created for the bowl design now would be a good time to mark the diameter of the bowl foot, otherwise use the $1/3$ - $2/3$ rule, $3/5$ rule or golden ratio and mark the diameter of the bowl foot that looks good.
 - ii. You may want to make the blank round if it is visibly out of round or vibrating.
 - iii. When turning the outside of a bowl you will start your cut at a smaller diameter and push the tool toward a larger diameter, remember that the tool cuts in the direction the bevel points.
 - iv. You are not in a hurry, take small cuts first by cutting off the bottom corner of the blank and taking small bites continue making the outside of the bowl.
 - v. Remove the tailstock when it gets in the way, take the live center out and put it away then place the tailstock on the floor or on the workbench. I am allergic to live centers left in tailstocks; they make my ankles break out in little red spots!
 - vi. Refer to the design drawing if you have one or go by eye to make the outside of the bowl. I repeat, remember that the tool cuts in the direction the bevel is pointing and the wooden end of the tool must be moved to steer the cutting edge.

(Note) When the tool first touches the wood the flute must be closed. Imagine a capital letter “C” but backwards (for the outside of the bowl.) This allow the cutting edge to contact the wood straight on and makes a line which is enough to allow bevel contact. Then rotate the tool clockwise to the 11 o’clock position (for the outside of the bowl.) Then push the tool to make the cut, steering by moving the handle to make the cut look like what you want it to look like. For the inside you will need to start with the flute closed then rotate to the 1 o’clock position

- vii. Continue making small cuts to close in on the design that you have in mind or on paper. If you have your design on paper, you could check the diameters vs the position down from the top, just saying.

10. Sanding

- a. Sanding the turned bowl should be done in this manner.
 - i. Sand the outside when you finish turning it before you reverse it in the lathe to turn the inside.
 - ii. Sand the inside when you finish turning it.
 - iii. Sand the bottom when you finish it.
- b. Sandpaper comes in many different forms.
 - i. Sheets
 - ii. Rolls
 - iii. Pressure Sensitive backing
 - iv. Velcro backing
 - v. On either cloth or paper substrate
 - vi. Stearate coated (helps to prevent clogging)
 - vii. In grits ranging from very very coarse 36 grit to extremely fine 32,000 grit. I usually start with either 120 grit or 180 grit and sand the wood through 320 grit or 400 grit. Wet sanding the finish should start at 400 grit and go through 1500 grit. Then use polishing compound.
- c. Sandpaper must be kept moving at all times when in contact with the wood.
 - i. This can be done by moving your hand, that is being burned by the friction of the sandpaper against the wood, from side to side
 - ii. Power sanding using an angle drill with a sanding disc in the chuck. This method can create unwanted dips and groves if you let the sanding go on while the drill is stationary relative to the bowl.
 - iii. Use of a self powered sander.
 - iv. Final sanding by hand after the bowl is removed from the lathe.



Figure 1 Self Powered Sander

11. Signing your work

- a. You should always sign your work with either a burning pen or brand or permanent marker that is archival quality (available at art stores.)

- b. The species of wood.
- c. And the date or the year you completed the bowl.
- d. If you are intending to sell your work then a code for the date is better, folks usually don't want to purchase "last years" model.

An Example of Date Code starting at 2020

Year	Year code	Month-Week-Day code
2020	A	The day # since Jan-1
2021	B	
2023	C	
2024	D	
2025	E	
2026	F	
2027	G	
2028	H	
2029	J	

So August 16, 23 would be "C238"