

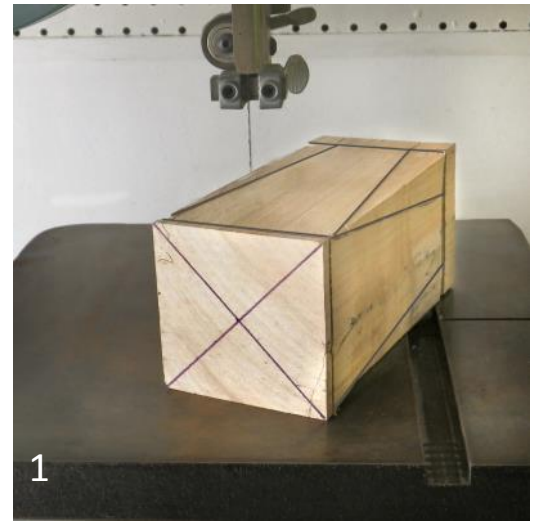
# Square to Round Bowls, Vases & Hollow Vessels

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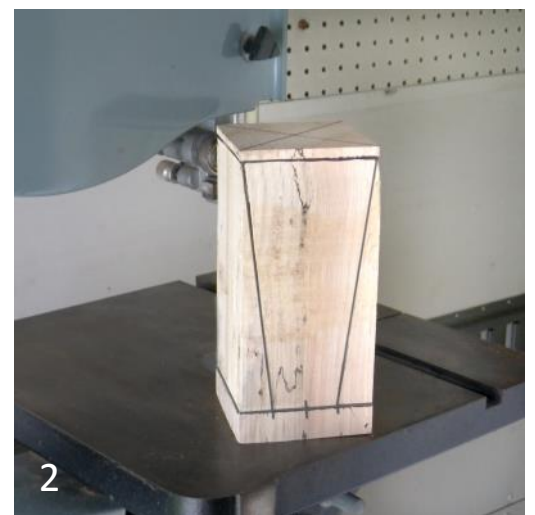
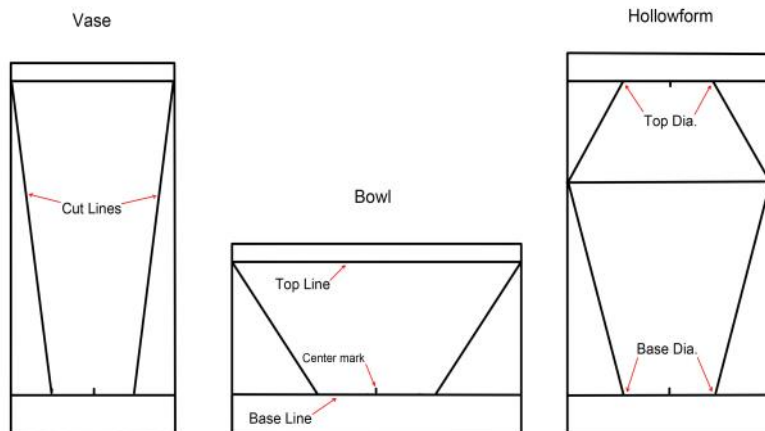


**Decide on design and layout cuts.** It is important to have your blanks perfectly cut with square and parallel sides this will help to make the corners and sides even when turned.

First carefully mark the centers of the top and bottom of the blank (1). Draw a line around the blank on all 4 sides  $1/2'' - 3/4''$  up from what you want to be the bottom end (base line), then draw a line around the blank on all 4 sides  $1/4''$  down from the top end (top line). Starting  $1/4''$  down from the top gives you extra wood at the top to be able to true up the top and still leave enough square wood to be able to bring your curved side cuts up to the top corners without cutting one corner off due to the blank being out of square or off center. If you want to dome the top up on a piece you will need to mark your top line farther down to allow more waste wood at the top for the dome. Decide what you would like the final base diameter to be. Put a mark at the center of the base line on all 4 sides of the blank. Measure out from this center mark the amount needed to give you your base diameter. Do this on all 4 sides. From these marks draw lines to the outside corners of your line  $1/4''$  down from the top (2). These lines represent your cut lines.



**Below** are examples of layout lines for some basic forms.

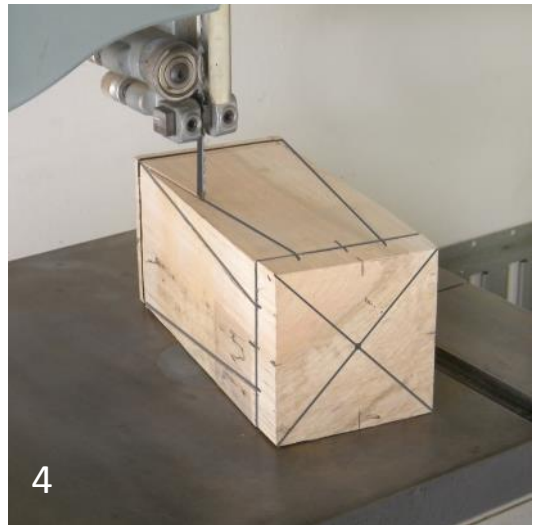
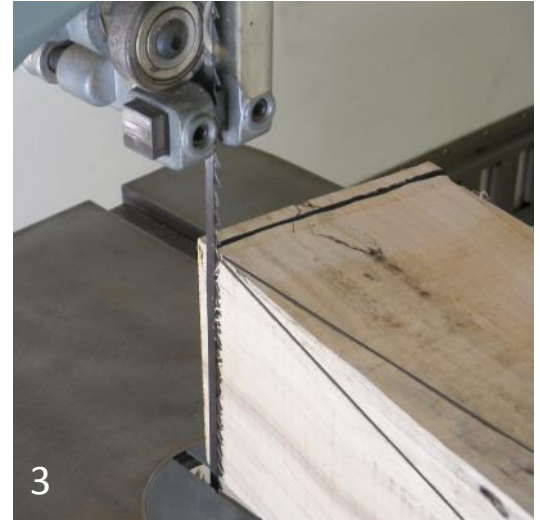


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**Cut sides on the band saw.** I make these cuts free hand following my drawn lines but a miter fence could possibly be used. I use a fine tooth blade to achieve the smoothest cut possible. This will reduce the time needed to finish these sides if you aren't going to texture or embellish them. Starting your cuts at the line  $\frac{1}{4}$ " down from the top (3) make cuts carefully following the angle lines (4) on all 4 sides **stopping** at your base line  $\frac{1}{2}$ " up from the bottom of the blank. Do not cut off any part of the square base portion it is important for supporting the blank for all the side cuts. Take your time and make as straight a cut as you can. It will save you much time and effort when sanding the sides. Remember it's better to make sure to cut on the outside of the lines because it is easier to sand off a hump rather than everything around a valley. Turn the blank sideways and make cuts following you base line into your angle cuts (5). As you do this the angled pieces will fall away from the blank leaving you a blank with  $\frac{1}{4}$ " of flat square area at the top and  $\frac{1}{2}$ " of flat square area at the base (6). Leave this  $\frac{1}{2}$ " thick square portion at the base as this will become your tenon. **Do not attempt to cut any portion of this square base off on the band saw as this would create a very unsafe cutting situation.**

**Hint:** Be sure to use a sharp band saw blade, It will start the beginning of the angle cut easier, cut straighter and not wander.

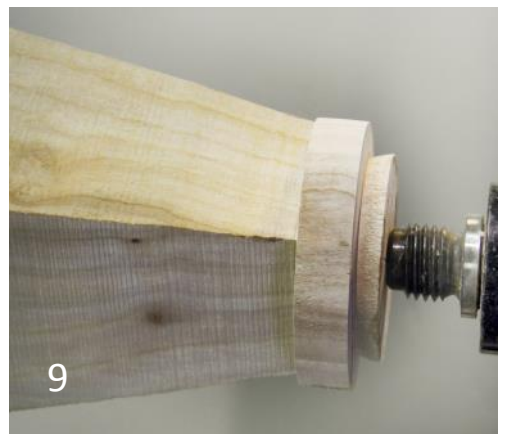
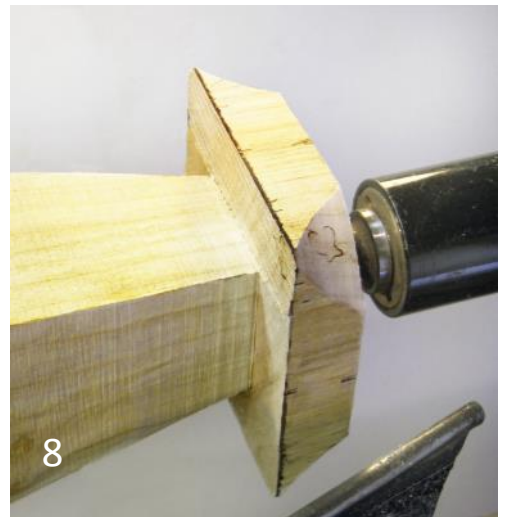


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**Turn the bowl or vase between** centers. Carefully align the blank between centers using the center marks made previously. I always place the tenon end toward the tailstock so I will have the live center mark for when I jam chuck the piece to remove the tenon and finish the bottom. Take care now to align the blank to make sure that the corners will be cut evenly when you start rounding the corners. Begin by forming the tenon on the bottom by slowly rounding the corners of the  $\frac{1}{2}$ " thick section of the base (7). Cutting this section from square to round is good practice to carefully work on your technique to achieve clean cuts for when you start cutting the top edge of the piece (8). Finish cutting the tenon making sure the corners are clean and sharp (9) so the face of the chuck jaws will make firm contact with the base of the blank. This is very important for a strong hold and to minimize vibration when hollowing tall vases and hollow forms. For most of my work I use a  $\frac{5}{8}$ " side ground Ellsworth style bowl gouge, but on these small intermittent corners and thin wing bowls I switch to a  $\frac{3}{8}$ " bowl gouge ground at 40 degrees for my light finish cuts. If this is going to be a vase or hollow vessel that tapers from smaller at the top and bottom to larger at the middle, the top portion should be formed and then the inside hollowed before removing the wood from the sides of the bottom section. This mass is needed to help support the piece when hollowing the inside.

**Hint:** Using a faster lathe speed, a smaller freshly sharpened gouge and taking very light cuts will help to eliminate chipped edges and torn out end grain. I will try to get as smooth a finish off the tool as possible and then clean up any tool marks by shear scraping if necessary. Trying to sand the corners on the lathe will usually result in rounding over the edges.



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**True up the top & Hollow the interior to final shape.** Place the blank into the chuck (10). It is a good idea to bring the tailstock up for support on taller pieces, this greatly reduces vibration helping to achieve a cleaner finish cut on the end grain, and also adds a margin of safety when increasing the speed. With a freshly sharpened gouge make light finish cuts to true up the top of the piece and shape the top rim as you like, flat, concave or convex to suite your creative ideas. On the end grain of softer or spalted woods that tend to tear out I will use a 3/8" spindle gouge (11) this will usually give a cleaner finish cut. For a bowl now you can cut whatever size bowl you like into the top side. For a vase or hollow vessel I will drill a 1" hole into the piece this eliminates the slow moving hard to cut center portion of the blank to make hollowing easier. I prefer using a metal cutting drill bit (12). I've found it cuts end grain very well and does not give me a flat bottomed hole with a point hole in the middle which is hard to remove. Because this is end grain I like to use either the ROLLY MUNRO HOLLOWER or the Sovereign Ultima Hollowing System by Robert Sorby for hollowing the interior of vases or hollowforms. Hook type tools are also very efficient but a bit harder to use and control. Some of the reasons I like to use these shielded cutter type tools is that they are catch-free, give a clean, fast cut with minimal vibration and with a little practice they are easy to control. Here I am using the small Rolly Monro Hollower (13 & 14) for hollowing the inside of the vase. I will use a Negative-Rake scraper to smooth out any tool marks left by the cutter and finish the interior, then do any needed sanding.

*Information on Negative Rake Scrapers by Stuart Batty can be found in the SPRING 2006 issue of the AAW Journal, AMERICAN WOODTURNER.*



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**Shape the exterior:** Once the interior is completed I begin shaping the exterior of the vase. Starting near the middle of the blank begin making downhill bevel supported cuts from right to left making the cove shape you want for the rim of your vase (15 & 16). As you make your cuts to remove wood and shape the vase always practice good smooth finish cuts so as you near the rim you will be prepared to make the last perfect cut. Because this piece is end grain all cuts should be made downhill to the grain for the smoothest finish. Carefully continue to work this cut up to the corners at the rim. When nearing the top rim stop the lathe to check to be sure you are not cutting off one of the corners (17). The corners are not very visible and take nearly no pressure from the tool to cut them off. If you reach one corner before the others you will need to stop cutting. You will have to adjust the flat sides later by sanding them to make the corners line up.

Continue shaping the remaining flat sides with downhill cuts toward the bottom portion of the vase and begin to roll the bottom curve over well past the interior depth (18). Then following the interior shape taking care not to make the outside curve to soon, cut the bottom to the desired thickness. Check the thickness in the bottom of the vase before making that last cut. It never works out well when the exterior curve intersects the interior curve.

**Note:** There some instances with certain designs when I will shape more of the outside of the piece before hollowing the interior, such as the vase shown at the bottom of the last page mounted on the 'Reverse Chucky'. The exterior sides of this piece were mostly completed leaving enough mass in the bottom area to support the hollowing process which was intentionally cut through the sides of the piece.

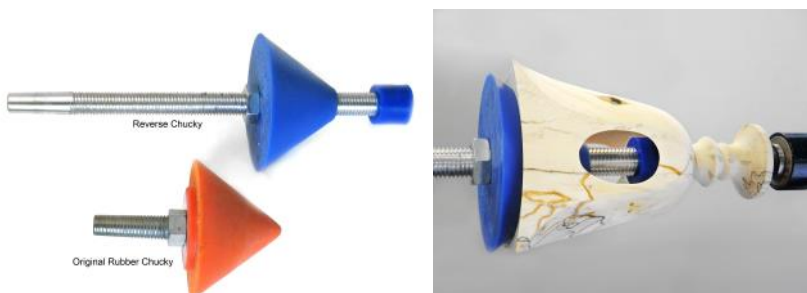


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**Add any transition detail you might like between vase and the base (19).** Be aware if the top of the vase is large and/or unusually shaped and out of balance and the transition or detail between the vase portion and the base is small you should bring the live center up into the vase opening with a 'RUBBER CHUCKY', a ball or something inside the vase to support it to prevent the vase from being spun off balance and broken off.

**Reverse / Jamb Chuck and finish the base.** Remove the piece from the chuck and using the previously established center point from when you first cut the tenon between centers, reverse and jamb-chuck the piece to finish the bottom of the foot and remove the tenon. I use an 'Original Rubber Chucky' (20) made by Rubber Chucky. When I have a thin vase or hollow form that could be cracked with pressure on the rim I will use the 'Reverse Chucky' see all the Rubber Chucky products online at [www.rubberchucky.com](http://www.rubberchucky.com). The 'Reverse Chucky' has a #2 Morse Taper with a threaded rod which has a urethane end cap and a urethane cone along the rod. The rod extends down into the vase or hollow form and puts all the holding pressure into the bottom of the piece, then the cone threads into the opening lightly touching it to alighting it and prevent the rim from wobbling. The urethane material of the Rubber Chucky's gives a good grip without much pressure. A homemade jamb-chuck of wood can also be used. If using a homemade jamb chuck I use a thin piece of leather or a couple of layers of paper towels to pad the inside. I would suggest not using a soft or rubbery pad that will allow the piece to wiggle or move on the jamb chuck as this will make it more likely for it not to align properly and cause an uneven bottom or a catch. Be sure to have the jamb-chuck fit the inside center contour of the piece to reduce the possibility of cracking it with too much pressure. Finish the foot or bottom as you like. I like to undercut the base which gives it a more finished appearance (21). If you are not planning to embellish the sides that were cut on the band saw they can either be finished by sanding on a belt sander or by hand.



Thin vase shown mounted on a 'Reverse Chucky'