

## **Turning the Clamshell Box**

Demonstration by Wayne Furr, SWAT 2016



The clamshell box is a stylized design based on a natural clamshell. The idea and design of this clamshell box comes from my good friend Mark Baker's book, *Woodturning projects: a workshop guide to shapes*; Guild of Master Craftsman Publications, LTD, 2003, reprinted 2004 & 2005, pages 52 & 53. The shape of the box is pleasing in form, a joy to hold and fun to play with.

Most turners learn to turn a bowl early on. But the challenge; can you turn two nearly identical bowls with only a slight difference? The difference being that one side has a bead to hold the two halves together and the other does not. Another issue is that the grain runs horizontal, which is not what we normally see in boxes. During the demonstration tool use will be covered along with safety issues stressed. This demonstration is geared for advanced beginners to intermediate wood turners.

### **Selecting and preparing the blank for turning**



Figure 1

Select a suitable block of wood that has a nice grain to simulate the natural clamshell. The initial blank should be about 6" square and 2 1/2"-2 5/8" thick. Once you have a suitable blank the next step is to mark and divide it into two nearly equally thick pieces. One side should be about 1/8" more in thickness than the other. This will account for the bead to hold the two pieces in place when finished (See Figure 1).

Once the square has been divided into two pieces it is time to mark the center and draw the circle. You can do this by using double sided tape and sticking the two halves together with the band sawn sides facing up, place the thicker half on top. After the center has been marked draw a circle that extends to the edges of the turning square (Refer to Figure 2).



Figure 2



Figure 3

Leaving the two pieces stuck together it is time to band saw them into circles (Figure 3). When they are stuck together they can be band sawed as one.

Because we will be using a screw drive to mount the blanks to true up, turn the bottom, and tenon, it is time to drill for the screw drive. I am using the screw drive and talon chuck. The directions call for a hole of  $1\frac{1}{32}$ " and  $\frac{3}{4}$ " deep. I have found that the  $1\frac{1}{32}$ " is a little too tight making the blank too difficult to screw on and off. I find that a bit size of  $\frac{25}{64}$ " works better for this project. Because our blanks are only  $1\frac{1}{4}$ " thick a depth of  $\frac{3}{4}$ " is too deep, so drill only  $\frac{9}{16}$ " (Figure 4). Use spacers to take up the space between the face of the chuck jaws and the blank (Figure 5).



Figure 4



Figure 5

### What is a safe lathe speed?

Before getting into the actual turning, now is a good time to talk a little about lathe-speed safety. I have rarely been to a demonstration when the following question was not asked: "What speed are you turning?" The demonstrator will look down at the speed dial and give what the indicator says. This is a very important safety question and one that we should all take to heart. Every once in a while we hear of someone that was injured or even killed when a piece came apart and hit them in the face. Most if not all lathe manufactures provide a chart of safe lathe speed in their manuals. But the big questions, how many of you actually looked at the one that came with your lathe or put a copy up next to the lathe as a reference? The truth is, we don't! About 45-years ago Dale Nish came up with a simple formula that is easy to remember and provides safe speeds when starting a new piece. The formula is  $D \times \text{RPM} = (\text{a number between } 6000 \text{ \& } 9000)$  where  $D$  = the diameter of the blank, RPM is the unknown that we are searching for, and the number between 6000 & 9000 is just a number. Since the unknown is the RPM, we simply divide the number 6000 to find a safe low turning RPM then divide 9000 to find the fastest safe RPM to turn. A complete description of this can be found at <http://blog.woodturnerscatalog.com/2012/08/safe-wood-lathe-speeds/>

Next, true up the edge of the two pieces as one (Figure 6).



Figure 7

After you have trued up the edges of the two halves as one, it is time to true up the bottom face (Figure 7).

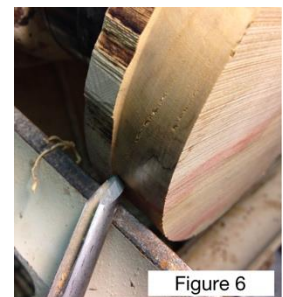
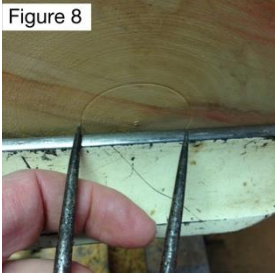


Figure 6

Figure 8



After the bottom is trued up and smooth, it is time to measure and turn the tenon for the chuck. I have set the dividers to 1 3/4" which is the minimum diameter for them to close down on the tenon. By eye, I estimate the center of the revolving piece and place the divider's right and left points equally on each side of the center, being careful only to touch the left point to the piece. As the image starts to develop on the piece, I can see if an adjustment is needed to the right or left to make the diameter of the tenon (Figure 8).



Turn the tenon and then rough shape the back of this piece. Leave the rim at about 1/4". Then separate the two halves and set this piece aside (Figure 9).

It is time to repeat steps 7, 8, & 9 on the half still on the lathe. This time leave 7/16" at the rim. This will allow enough wood to make the bead match up the two halves (Figure 10).

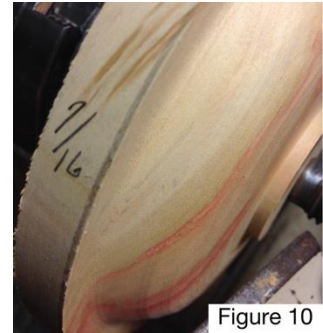


Figure 10

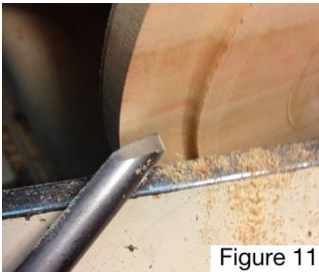


Figure 11

Once we have the rough shape for the back of the piece, it is time to reverse the piece and place it in the chuck jaws. The first step is to clean up the face to remove any unevenness and shape the edge in from the edge about 5/8", down about 1/8" then curve it down another 1/16" to 1/8" (Figure 11).

The amount of curve will give the appearance of the clam shell being closed or partially open. The bead that we are making during this step should be about 1/8" tall and slightly rounded to hold the other piece in place (Figure 12). I should point out that this is also different than doing boxes in the traditional way of doing the mortise or recess first.

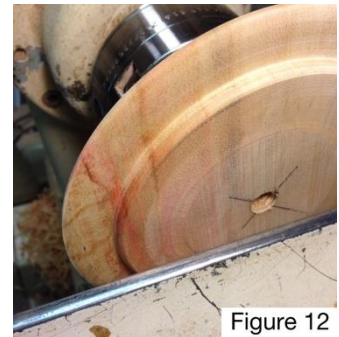


Figure 12



Figure 13

When we are satisfied with the shape of the curve on the lip and the bead that holds the two pieces together, it is time to start shaping the inside of the bowl (Figure 13).

As you progress into the bowl, keep checking the thickness of the wall. What we are looking for is about 1/4" to 3/16" thickness (Figure 14). Once we have reached the desired thickness and removed any tool marks, it is time to sand to the desired grit. After sanding, apply sanding sealer/finish to the inside of the piece.



Figure 14

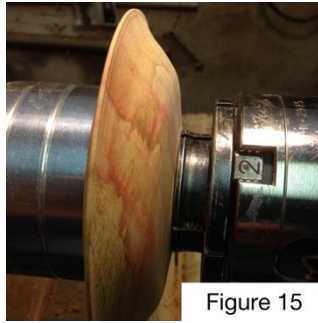


Figure 15

After the sealer/finish is dry, it is time to reverse the piece and finish turning the other side. The method that I use is to use an adapter to fit the chuck onto the live center and a vacuum chuck, I can center the piece perfectly (Figure 15). Once I have pulled vacuum, I remove the chuck from the tail stock. I remove the point and use only the ring center to hold the piece in place for the first part of the final shaping. This is done for safety. When I am satisfied with the edge and curve. I remove the tailstock.

The thickness at the edge should be about 1/16". With the tailstock removed, I use a shearing cut to remove the remaining tenon (Figure 16). By using a vacuum chuck, I can sand this entire side and apply a sanding sealer/finish.

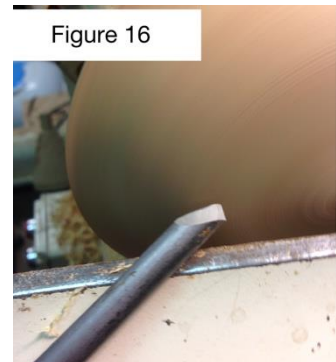


Figure 16

When the sealer/finish is dry you can remove the piece and start on the second piece that we roughed out and set aside. Since we cut the tenon and rough shaped the outside of the piece during the first edge true up (Figure 9), we can mount the piece on the chuck and start on the inside. I start by using my dividers to measure the inside of the bead of the first piece (Figure 17). Then transfer that diameter to the second piece using the same method that I used when marking out the tenon (Figure 18). Once this is done, shape the outer edge with the downward slope as you did on the first side (Figure 19).



Figure 17

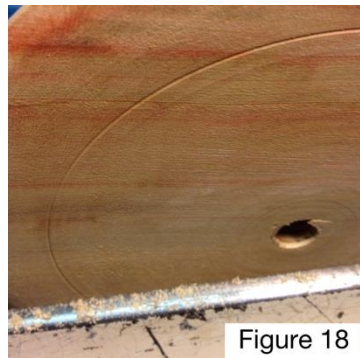


Figure 18

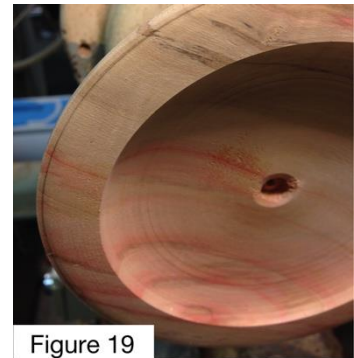


Figure 19

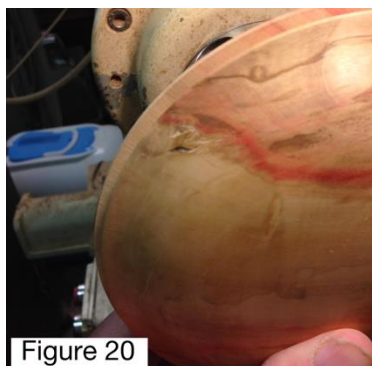


Figure 20

After the rim has the shape that you like, it is time to start sneaking up on the actual fit of the two pieces (Figure 20). Continue working on the fit until it is a snug, but not a tight fit as we like to see in a traditional box. After the fit is a nice one, continue to shape out the bowl, clean up any tool marks, sand to the grit of your liking, and apply a sanding sealer/finish. It is now time to reverse the piece and finish the outside (Refer to Figures 15 & 16).

When you finish going through the steps referred to in Figures 15 and 16, you should now have a finished clamshell box. I generally buff my pieces to the final luster that I like.



#### Suggested TOOLS

Bowl gouge: 3/8" Preferred, or 1/2"  
Parting tool: 1/8" or 3/8" beading parting  
Round-nose scraper  
Square-edge scraper  
Dividers or compass  
Inside-outside calipers