

The Making of a Hairy Oak Vase – using a Segmented Turning Method by Colin Parkinson



Hairy Oak (*Allocasuarina inophloia*) also called Woolly Oak or Stringybark She-oak, is a member of the Casuarinaceae family. Coolabah burl (*Eucalyptus coolabah*) is used in the feature ring. Rock Maple (*Acer glabrum*) is used in the veneer rings.

#### Wood used and why

The idea for this vase was to use a couple of natural edged, warped boards that I have had in the shed for about 7 years. Because of the warping, I had to cut the boards down into smaller sections so I could process them (flatten, thickness and straight edge) and arrive at boards that I could to work with.

## One of the original boards



#### Planning of how to construct

I used a computer drawing application (DrawPlus) to arrive at a shape and draw up the rings in profile that will be needed. This drawing is then used to create the cutting list in excel.

Drawing plan of project



#### The plan

An excel spreadsheet is used to work out what is required for each ring and how much material is required. The result of these calculations and the drawing is used interactively depending on the wood pieces I could use. I also take into account the figure in the segment that I want to be seen. In this case the width of the segment was dictated by the thickness of the board.

#### **Excel** Calculations

|               | Primary<br>widths | width<br>(from<br>plan ) |    | thickness<br>(from<br>Plan) | Radius<br>(from<br>Plan) | diameter<br>(from<br>Plan) | Radius (inc<br>waist<br>allowance) | length | No of ring<br>Segments | Mitre<br>angle | Tan For<br>Mitre<br>angle | stock<br>length |
|---------------|-------------------|--------------------------|----|-----------------------------|--------------------------|----------------------------|------------------------------------|--------|------------------------|----------------|---------------------------|-----------------|
| 14 Hairy Oak  | 90                | )                        | 24 | 19                          | 45                       | 90                         | 50                                 | 19.9   | 16                     | 11.25          | 0.19891                   | 414.6           |
| 13 Hairy Oak  |                   |                          | 24 | 19                          | 62                       | 124                        | 67                                 | 26.7   | 16                     | 11.25          | 0.19891                   | 529.6           |
| 12 Hairy Oak  |                   |                          | 24 | 19                          | 73                       | 146                        | 78                                 | 31.0   | 16                     | 11.25          | 0.19891                   | 604.0           |
| 11 Hairy Oak  |                   |                          | 24 | 18                          | 78                       | 156                        | 83                                 | 33.0   | 16                     | 11.25          | 0.19891                   | 637.8           |
| 10 Veneer     |                   |                          | 24 | 3.5                         | 78                       | 156                        | 83                                 | 33.0   | 16                     | 11.25          | 0.19891                   | 637.8           |
| 9 Centre      | 156               |                          | 24 | 36.4                        | 78                       | 156                        | 83                                 | 33.0   | 16                     | 11.25          | 0.19891                   | 637.8           |
| 8 Veneer      |                   |                          | 24 | 3.5                         | 77                       | 154                        | 82                                 | 32.6   | 16                     | 11.25          | 0.19891                   | 631.1           |
| 7 Hairy Oak   |                   |                          | 24 | 17.4                        | 77                       | 154                        | 82                                 | 32.6   | 16                     | 11.25          | 0.19891                   | 631.1           |
| 6 Hairy Oak   |                   |                          | 24 | 17.4                        | 72                       | 144                        | 77                                 | 30.6   | 16                     | 11.25          | 0.19891                   | 597.2           |
| 5 Hairy Oak   |                   |                          | 24 | 16                          | 65                       | 130                        | 70                                 | 27.8   | 16                     | 11.25          | 0.19891                   | 549.9           |
| 4 Hairy Oak   |                   |                          | 24 | 13.3                        | 58                       | 116                        | 63                                 | 25.1   | 16                     | 11.25          | 0.19891                   | 502.6           |
| 3 Hairy Oak   |                   |                          | 24 | 12.2                        | 50                       | 100                        | 55                                 | 21.9   | 16                     | 11.25          | 0.19891                   | 448.5           |
| 2 Hairy Oak   |                   |                          | 24 | 10                          | 44                       | 88                         | 49                                 | 19.5   | 16                     | 11.25          | 0.19891                   | 407.9           |
| 1 Hairy Oak   |                   |                          | 24 | 9.2                         | 38                       | 76                         | 43                                 | 17.1   | 16                     | 11.25          | 0.19891                   | 367.3           |
| ase Hairy Oak | 66                | 5                        | 24 | 9.2                         | 33                       | 66                         | 38                                 | 15.1   | 16                     | 11.25          | 0.19891                   | 333.5           |

Notes Primary widths

Actual diameter of the form

Thickness (from Plan) The thickness of each Row

Width (from plan ) The width of the segment

#### radius from Plan

This radius you need to add on a waist factor to be turned off

Tan method is better Tan (mitre angle) x radius of seg ring X 2

For stock length need to add saw allowance and handling allowance

Radius (inc waist allowance) radius from plan plus 5 mm turning waist This is used to calc length

### The cutting plan for the boards



Vase form 152 X 225 mm Hairy Oak vase cutting list Draw Plus 8

### Cutting and use of a sled

I use a table saw to cut segments. To cut accurate segments I use "Wedgee" sled. This homemade sled is set up accurately to cut the required angle of each wedge. An adjustable stop is used to be able to cut the segments to the lengths for each ring. You make a couple of spares for each ring also. A modified blade insert plate is used that helps to move the cut segment away from the blade. As the name implies a premade wedge is used to set up the sled for the angle used depending on the number of segments required in the ring. In this case, 16 segments.

My saw bench cutting jig (Wedgee Sled)



### Sanding

A 60 TPI cross cut saw blade is used in the table, (an 80 TPI would be better) and gives a good finish but when assembled you can see the difference between a saw cut and a sanded join. The use of the sander will give a very accurate segment that when all of the segments are joined in a ring will give you a gap free segment.

Sanding segments



### Cut and sanded rings



Checking ring for any gaps



## Gluing up rings

The segments of a ring can be glued together using two methods. Segments that were cut/sanded accurately can be glued up as a whole. I have used this method but the second method, gluing segments in two halves, then adjusted to remove any discrepancy on the sander. The two halves are then glued together to form the ring. This method can help eliminate errors when making the rings.

### Full method assembly



### Using half ring method



Sanding the half rings



As the segments are glued on the end grain, attention must be made to prevent glue starvation of the joint. *Notes on glue*. I used Titebond 3 for the Hairy Oak segments/rings and an epoxy for the Burl feature ring.

### Flattening

Before assembling the rings together at least one surface needs to be flattened. I mount the ring on the lathe and use a combination of turning tools and a sanding stick.

Flattening ring and sanding stick



### Making base ring

The base ring for this vase was made with an insert made from the same burl as the feature ring.

The vase holding block was assembled using a face plate and waist block. Onto this block the base ring is accurately centred and glued.

It is preferable to use a face plate in preference to a chuck as the job will be on and off the lathe a number of times, and will not change its alignment compared to remounting using a chuck.

After the insert is inserted the base ring is flattened in preparation for ring 1.

### Adding rings

It is important that rings are glued on centrally. I use a simple measuring block mounted on the lathe tool steady to scribe a circle in pencil. The circle should be made about 2 mm larger than the next ring to be glued as a visual aid when assembling.

The ring can be assembled either on the lathe using the tail stock to apply pressure or on an assemble frame.

Marking out to centre ring - typical



Gluing on lathe – typical



# Gluing using a frame



### Turn base rings

After 3 rings have been added the inside is turned to the profile and dimensions from the plan

Turning base rings



### Adding further rings

Further rings are added in the same manner.

Adding rings



### **Turning lower half**

When the rings making up the lower half are assembled the inside is turned to the profile and dimensions from the plan leaving the inside top dimension smaller than required. This will be adjusted after the feature ring is added.

The out side is rough turned to shape again leaving sufficient area on the top ring to add the feature ring.

Turn lower half



### Adding feature ring

Add the feature ring in the same manner.

Turn the inside, including the feature ring to the profile and dimensions from the plan.

Sand and apply the surface finish to the inside.

Adding the feature ring to the lower half



## Feature ring internal turned



## Building the top half

The top half is built up in the same manner as the lower half.

The inside is turned to the same internal diameter as the lower half to create a smooth internal joint when joined.

## Top half being built



### Joining the halves

The two halves are joined on the lathe.

Joining the top and bottom



### **Turning outside**

Once joined the outside is shaped as per plan taking into account wall thicknesses

## Forming the top

The face plate is removed from the top and the waist block is turned off.

The top opening is profiled.

The internal join seam between the lower and the top halves is checked and cleaned up after gluing. If required the internal surface finish is restored.

Top with the waist mounting block removed



### Prepare for surface finishing

The outside is sanded in preparation for the surface finish.

Ready for surface finish



#### What surface finish

On this vase I wanted a high gloss finish. The Hairy Oak has an open pore surface to take into account so I made up a couple of test pieces. No 1 looked to be the best on this vase.

- 1. Feist Watson sanding sealer + 2 coats of wipe on poly (all sanded in between) finished with Wax.
- 2. Feist Watson Sealer + 2 coats of Tung oil finished with Wax.
- 3. Spray Lacquer.

Test pieces for surface finish



## Adding surface finishing

Surface finish was applied as per test of finishings.

## Surface finished



### Separating and finish turn base

A cage was created so that the vase could be removed from the mounting block and the base finished.

Separating and base



## The Final Project

