

# Southern Turners Project Sheet

## Eccentric Chuck



This project explains how to make a simple, low cost shop made eccentric chuck. Ensure all safety equipment is used appropriately. The blank size is up to the individual, but to begin with, try discs of approximately 130 mm diameter (for a finished size of 120 mm) and approximately 20 mm thick.



This chuck can be used in the making of pendants and boxes etc where offset or multi sided forms are desired. Blanks can be attached using hot melt glue, double sided tape or masking tape. The chuck can also be easily adapted to a screw chuck by gluing in a screw to the centre of the sacrificial disc (see below for a description of the parts).

The photo shows an eccentric chuck mounted in a 4 jaw scroll chuck with a pendant fixed with masking tape ready to have the offset hole turned into its face.

Please note that these chucks are made to fit one style of chuck and chuck jaws only – they are not interchangeable with different sized jaw sets.



Materials list:

Disc 1 – diameter to suit your scroll chuck and approximately 20 mm thick

Disc 2 – approximately 70 mm diameter 35 mm thick (this can be changed to suit your individual needs)

Disc 3 – as per disc 1

Cross piece – approximately 15 mm by 10 mm hardwood; length to suit diameter of disc 1

Nails – 25 mm long, 1 mm diameter or similar, 2 off

Screws – countersunk head not less than 25 mm, 5 off



Drill a small (1 or 1.5 mm) hole in the centre of discs 1 and 3. Use a relatively loose fitting nail or similar in the holes to ensure discs 1 and 3 are aligned then place discs 1 and 3 against the jaws of your 4 jaw chuck or waste block (as shown) and secure by tightening the live centre (ring centre works best) to create a friction drive. Turn the discs to a cylinder; don't bother to square the ends.

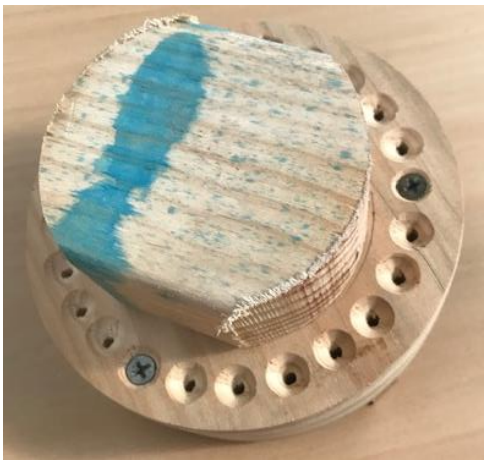


Cut the cross piece to match the diameter of discs 1 and 3. Glue and screw the rectangular piece of wood accurately across the centre of disc 1. When the glue has dried true up the disc. Drill an interference fit hole toward the outer edge of the cross piece where jaw 1 and the cross piece intersect then insert one of the nails (not shown) – ensure it is a tight fit – if not use CA glue to hold it in place. Cut off the point of the nail.

Determine how much eccentricity you want (8 to 9 mm is suggested) and move the disc sideways to the desired point. Mark the intersection of the cross piece and jaw 3. Remove the disc and drill and install nail 2. Cut off its point.



Draw a circle approximately 10 mm from the edge of disc 3 and mark 24 equidistant divisions ie every 15 degrees(accuracy is necessary for best results).



Drill and countersink holes to match your screws.

Fasten disc 3 to disc 1 using the three remaining screws at equidistant centres. True up the face of disc 3 taking care not to contact the screw heads.

Measure and mark the centre of the reverse face of disc 2. Drill a small hole as per previously to aid alignment with disc 3. Glue and clamp discs 2 and 3 and allow glue to dry. Disc 2 is a sacrificial block that can be replaced when damaged through constant use.



Mount the assembled eccentric chuck onto your 4 jaw chuck in the concentric position and true up the sides and face of disc 2.



Move the chuck to the eccentric position and mark a circle on the face of disc 2 with a point tool or long point of a skew. Use a permanent marker or other method to mark the point where there is the shortest distance between the circle and disc 2 (in this case marked with an arrow). This aids aligning blanks to cater for grain direction / timber strength etc. Note that the location of the screws fixing disc 3 to disc 1 are also marked to aid realignment after it has been used in other positions.



The photo shows the rear of the completed chuck with the concentric and eccentric points marked along with the location of jaw 1. Always remounting your eccentric chuck in the same position on your scroll chuck aids accuracy when multiple facets are being turned. As can be seen the location of the fixing screws should have been slightly further toward the edges as they almost interfered with the locating pins (nails).

The eccentricity of your chuck can now be rotated simply by undoing the 3 screws, rotating disc 3 by whatever amount suits your needs and resealing. Always use the three holes in disc 1 as the reference points for rotational movement ie the screws will be in different locations in disc 3.

Blanks can be secured to the chuck using hot melt glue, double sided tape or masking tape. Always consider safety when selecting your securing system

A simpler version can be made by not having disc 3 and glueing disc 2 straight onto disc 1.

Enjoy using your new chuck for years to come.