

Six-strand celtic knot

This is my first tutorial, so you must bear with me. I hope that this answers more questions than it creates.

There are a few things that this design has in common with all of the other celtic knots designs:

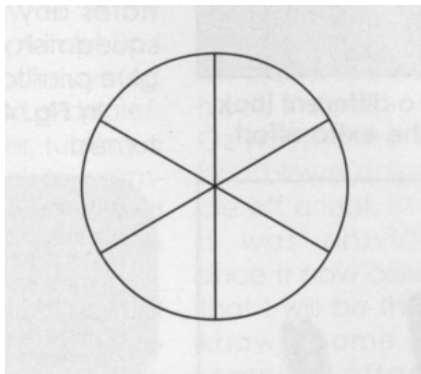
1. The thickness of the inserts must be exactly the thickness of the saw kerf of the cuts.
2. The hole for the tubes must be in the exact centre of the blank.
3. The cuts must all be made exactly the same distance from the end of the blank.

The only thing that is different in this design from two and four strand knots is that you work with a cylindrical blank instead of a square one.

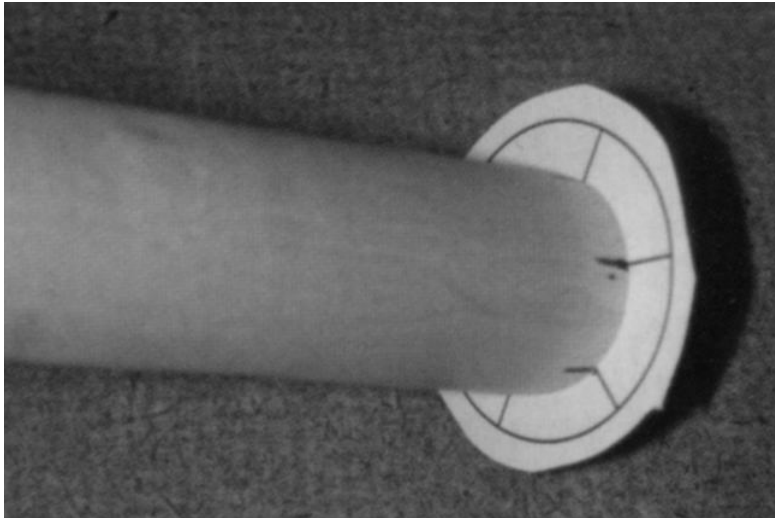
The first step in making this design is to turn your square blank between centers into a cylinder. Don't cut anything from the ends of the cylinder when you are done. You need the centre marks for drilling for your tubes.

I suggest that you don't cut your blank into two pieces until you have your knot done. The longer blank makes it easier to hold while you are cutting for your inserts.

Now that you have your blank round, you need to divide it into 6 sections. Use any computer application that you have that will draw an equally divided round pie chart. You want it to be about 1" in diameter. Here is one that you can cut out if you don't have access to a PC or such a program.



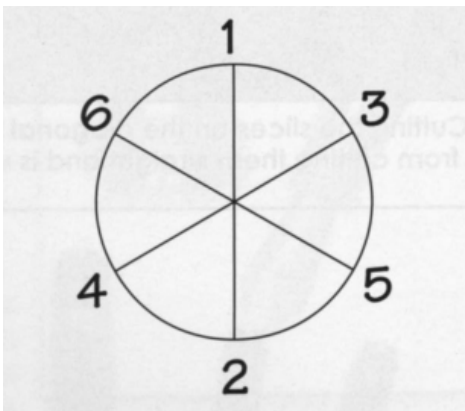
With the printed side of the pie chart facing into the blank, attach the pie chart to the blank with a tack going through the centre of the chart and the centre mark on one end of the blank. Here's what I mean:



With the blank vertical, put a mark on the blank at each point where a line on the chart touches the blank. You want the marks on the side of the blank, not on the end surface. You can see a couple of them in this picture.

Remove the chart and hold onto it for your next pen. (You are going to do another one, right?)

Now, number each mark on the side of the blank, according to this picture. This is the order in which you are going to make your cuts.

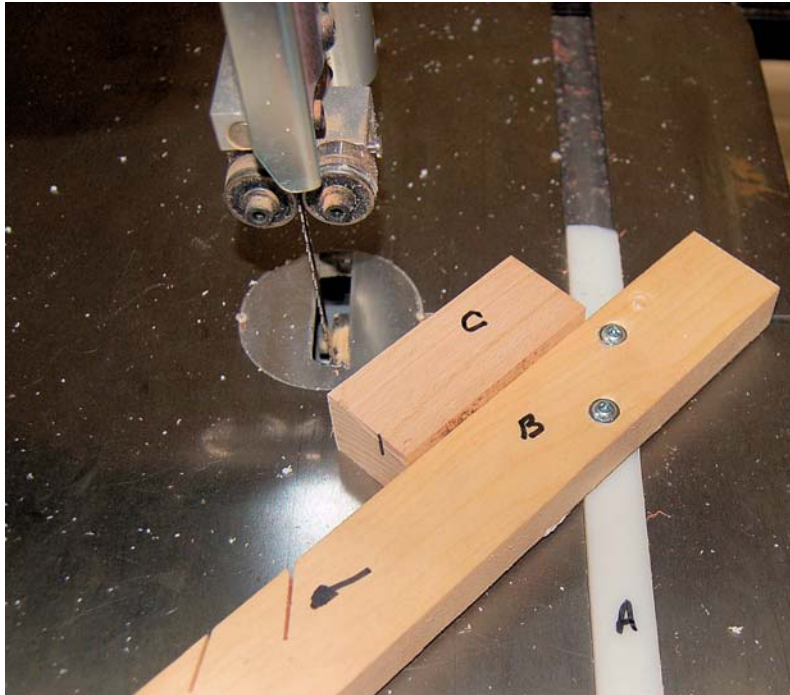


OK, the boring part is over. Now comes the fun.

There are two methods of cutting the blank. You can cut it all the way through, or you can cut it almost all the way through, leaving the two pieces attached by a very small bit. I like the latter method, because it eliminates the struggle to align the two parts and the insert without gluing your fingers to the pieces in the process. (DAMHIKT) It also makes it easy to see if your inserts are the exact thickness of the saw kerf. However, if you are not the klutz that I am, you can cut the blank all the way through.

As to what to cut the blank with, that's up to you. I use my bandsaw because I'm too lazy to use a hand saw and mitre box, and I like the thin kerf that it produces. I've used my table saw, but I found the final knot too big for the pen.

Unless you make your cuts by hand in a mitre box, you will need some sort of jig to hold the blank while you cut it. Here is a picture of mine. Ugly thing, isn't it? However, it gets the job done.



Piece A is just a slider that fits into the mitre slot on my band saw.

Piece B is screwed to that slider. On this jig, it is at about 45 degrees to the blade. You can make it any angle you like.

Piece C is screwed to piece B. It is the stop against which you will hold the blank to make your cuts. You set it to the distance that you want the knot to be from the top or bottom of your pen.

A tip to help you decide how to position your knot: when you have your jig made, put it into the mitre slot on your saw, start the saw and slide it forward until you make a very short cut into piece B. (The arrow points to the cut.) Back out the jig and turn off the saw. Now you know the lowest point of the cut. If you want your knot to be in the middle of the blank, hold the blank against the jig and slide the jig until the blank just touches the blade. (The saw is not running.) The blade now shows you the starting point of all your cuts and the small cut that you just made in piece B shows you the end point. Slide your blank along piece B until the cut will be in the position on the blank where you want it – centered, toward the top, toward the bottom. Hold the blank there, and slide piece C to touch the end of the blank. Now clamp piece C to B or attach it in some other way.

Note on Piece C that there is a registration mark on its end. It is not critical where you put this mark, but you must have one. You line up each of the marks on your blank with this mark to make your cuts. This ensures that your cuts are exactly the same number of degrees apart.

Now that you have your jig made and your blank marked up, it's time to make your first cut.

You simply put the blank against piece B and Piece C, with the number 1 mark on the blank lined up with the registration mark. Here's what that looks like:



I just hold the blank by hand, but obviously you can clamp it any way you like. I just found that clamping a round object to a square one was a pain.

Turn on the saw and cut either almost through the blank, or completely through the blank.

I'll move off the blank for a minute here, and talk about the inserts. As I've nagged about already, the inserts must be the exact thickness of the saw kerf. You can cut your inserts any way you like. I tend to cut mine on my bandsaw, but I've had good results on my table saw, too. Whatever way your cut them, you will need a zero clearance insert in the saw table, or you will lose your inserts. Again, if you're not lazy like me, you can cut your inserts by hand.

Make sure that your inserts are at least the same size as the diameter of your blank. I make them at bit bigger to avoid gluing them to my fingers. Or, at least the second time I did this, I avoided gluing them to my fingers.

Now, back to your blank.

Remove the blank from your saw and ensure that you have a clamp that will open wide enough to go from end to end of the blank.

Using your glue of choice, put glue on both sides of one of your inserts and insert it in the cut on the blank. (If you cut all the way through, you may want to glue the insert to one end of the blank at a time, so that you are not trying to hold 3 moving pieces.

Clamp the blank. Be careful not to use too much pressure, because you can force the blank out of true.

The glue you use will dictate how long you need to leave the blank in clamps. I use medium CA, so it only needs to be clamped for a minute or so.

When the glue had dried sand off the excess insert so that your blank is a cylinder again.

All the other cuts and insert gluing are done the same way.

When all your inserts are in and the glue has dried, flood the whole area covered by the inserts with thin CA glue. You want to make sure that all gaps are filled before you drill.

Now, you just cut the blank to the lengths that you want, drill and turn as you would any other blank.

Drill slowly when you hit the inserts. There is not much surface area holding them in place, and you can twist them out. (Another DAMHIKT.)

If your inserts are the same thickness as your saw kerf, and if you drilled in the exact centre of the blank, and if you kept the blank up tight against the stop on your jig while you sawed it, your knot will be perfectly symmetrical and a veritable wonder to behold.

If you try this technique, please post pics of your creations.

If you can improve upon this technique, please post details of your improvements. I'll do the same.

Grant