

Inside/out Turning

by John Lucas

Inside-out turning is a process where you take four pieces of square timber, glue them together and turn a design (usually a silhouette) into the part that will be the inside of the piece. Then take this apart, rotate the pieces, glue them back together and turn the outside. This is why it's called inside-out turning. I will try to describe the process of inside-out turning and hopefully stop you from making some of the errors that I have made. I learned most of what I know by trial and error, error, error. I listed my sources of information at the end of this article.

The Process

Start by cutting four pieces of wood equal to the length of your turning. Each piece must be perfectly square. This is important because you will have gaps in the turning if they are not square. I generally cut four separate pieces from a flat board, but if you want the grain to match it is possible to re-saw a piece of thick timber and square up each piece. The grain won't match perfectly but will be close. Since there is a learning curve to this style of turning I recommend turning some 2x2 scrap as experiments. I use pine 2x4's for practice (see photo 1.)



Photo 1.

Because you are turning the inside first, the outside shape will be limited. It is important to make a few trial runs so you can learn to see the problems. For practice pieces, I use strapping or filament tape to hold the wood together. This makes it easy to pull the tape back and reassemble the piece to check your progress. Start with simple shapes such as diamonds, circles, crosses etc. Shapes

such as hearts and flowers require you to undercut the turning when doing the silhouette. This is difficult to turn and to judge the shape.

Gluing the piece

To turn the inside, glue the four pieces together with a glue that can be separated. I have used CA glue, paper joints, strapping or filament tape, plastic tie wraps and hose clamps to hold the pieces together for the first turning. I prefer a paper joint. It is more secure and keeps the wood aligned properly. The space created by the glue will show up as a space in your silhouette so it is important to have a very thin line. I use newspaper for my paper joint. This creates a good bond and a thin line. Tape, tie-wraps, hose clamps and rubber bands all work well as “clamps” to glue the work but have drawbacks if they are used instead of glue.

Centering

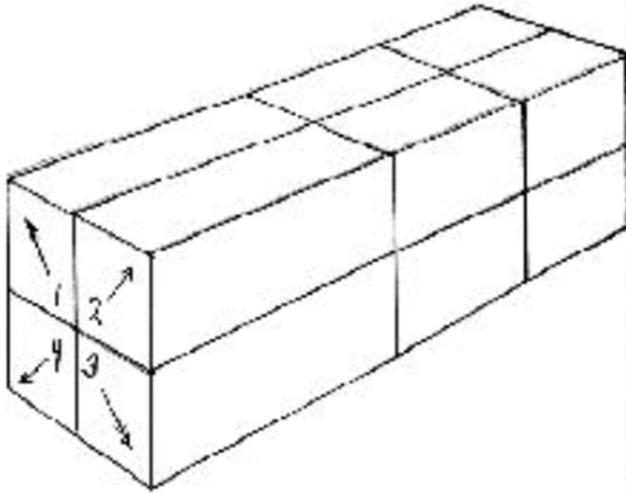
Centering is very important, so I take a very small sliver of wood (about 1/8 inch) off each corner of the square stock before I glue or clamp them together. After you get them together, the four “knocked off” corners make an accurate hole to align the center pin of your drive and tailstock centers. Label the end of each block so you will know how to reverse them later. I stack the wood together to find out which side should be out for the best grain pattern and then label the end with numbers and an arrow pointing toward the center. Turn them 180 degrees so the good side is in and glue them together with a paper joint. Spread glue on the piece and place newspaper over the glue. Clamp the pieces together and let it sit. It will take longer to dry than the glue normally requires so be patient. Use a cup center of some kind on the tailstock so you won't split the piece. I also use a fairly large drive center so the teeth help hold the four sides together. Long cones in the center of drive and tail centers will act like a wedge and split the paper joint.

Draw the design full size

I find it very difficult to accurately copy the silhouette without a drawing. After you complete the drawing, fold it in half and cut out half of the silhouette. When the drawing is folded in half, the cut out silhouette will stick out and make a perfect template to check your turning. You will also have a guide for the outside turning. Just because you can draw it on paper doesn't mean it will work in the final turning. The outside shape is dependent upon the inside. Make a test piece to check your design.

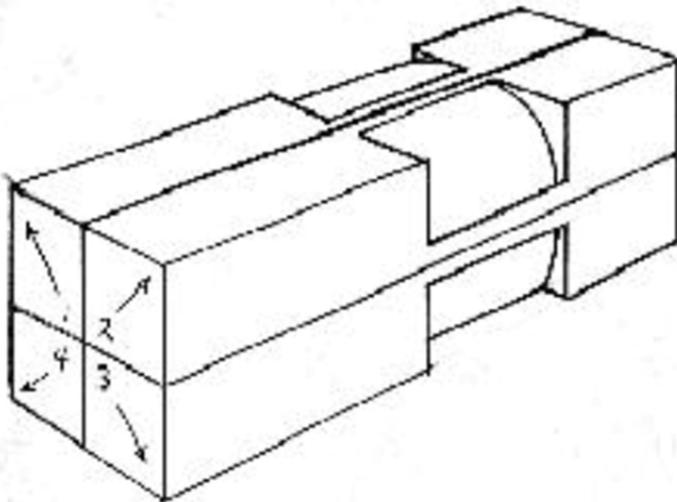
Rough out the silhouette

I mark the edges of the design on the square block.



Drawing 1

Rough out only the area where you will place your silhouette. Don't round the piece down to a cylinder. Leave small flats on all 4 sides: 1/8" to 3/8" is fine. If you round it down to a cylinder, there will be a thin line running through the piece that destroys the effect of the silhouette. I mark lines all the way around the square at the edges of the silhouette and then use the toe of the skew to cut a large "V" cut on the inside of this line. This keeps me from tearing off a corner. I start the "V" on the inside of the mark and work my way back to the line with small cuts by sighting down the bevel of the tool. Then I use a bowl gouge or skew to rough out the cylinder, leaving the four flat areas.



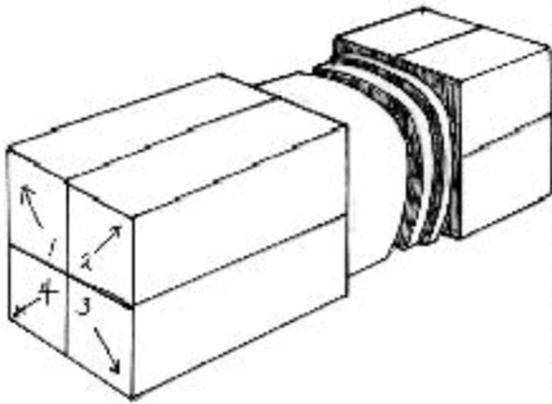
Drawing 2.

The outside corners will be the center of the piece when it is reversed and re-glued. If you round these off you can't have a thin stem like the one in my candlestick

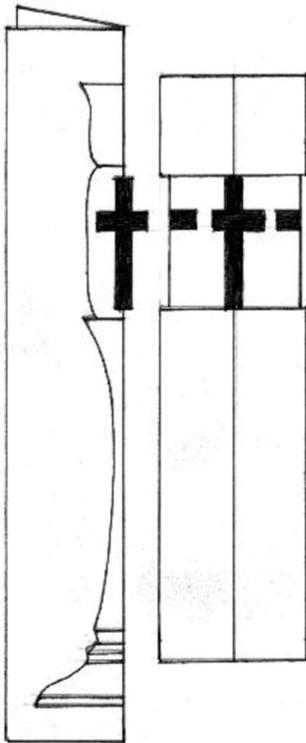
drawing. However, if you are making a lamp, you could knock off the corners about $\frac{3}{16}$ " and there will be a $\frac{3}{8}$ " hole down the center for the cord.

Silhouette

Now you are ready to cut the silhouette. Cut very carefully and check your progress often.



Drawing 3.

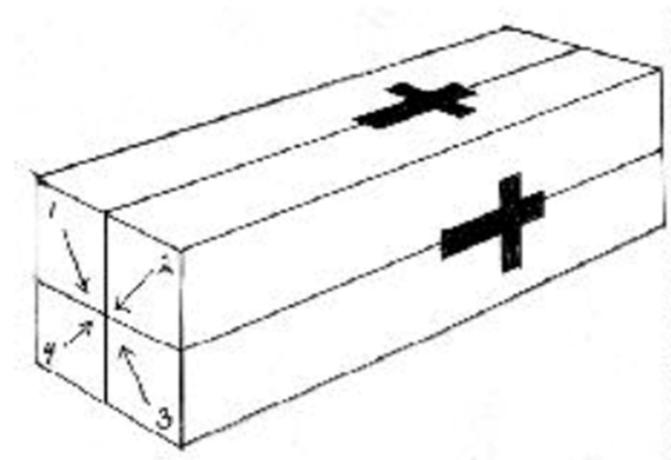


Drawing 4.

Stop the lathe and place the folded drawing on the flat side to see how the cut out portion fits in your turning. Check often and cut very carefully--it's very difficult to sand the inside of the silhouette. I end up using custom-made scraping tools a lot. They are easy to make. I use drill rod, old screwdrivers, and old allen wrenches. They can be ground to any shape fairly quickly. I don't even bother to harden them unless I know it's a tool I'll use a lot.

Re-Glue

When you have finished the silhouette, remove the work from the lathe and split the pieces apart. I use a 1" chisel. It should pop right apart. If it fights you or looks like the thin areas near the silhouette will break I drive a paring knife down the joint until it pops apart. Rotate each piece 180 degrees and then glue them back together. Don't get any more glue than necessary on the edges near the silhouette.

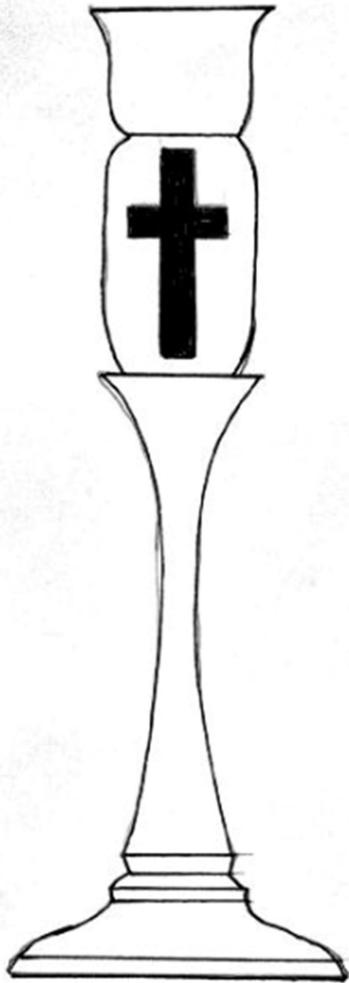


Drawing 5.

It will be difficult to clean off the squeeze-out on the inside of the turning. Trust me on this. If your pieces were not perfectly square you may have to glue up two pieces and then flatten one side before you glue up the others. This will affect the shape of your silhouette so take off as little as possible. If they were perfectly square, simply clamp them together with the silhouette aligned and wait for the glue to dry.

Turning the outside

Turning the outside is fairly straight-forward. Stop the lathe frequently and check the wall thickness around the silhouette.



Drawing 6.

It can be difficult to see and will “blow up” if you get it too thin. I am still learning about the shapes that will work together on the inside and outside. In the beginning, you should be prepared to change the shape of the outside to accommodate the wall thickness. Once you have made a few, you will have a better understanding of the process. I suggest starting with something simple like a circle or a cross. Cut several circle or cross silhouettes in a long piece of scrap material and then play with the outside shapes to see what happens to the wall thickness and the shape of the silhouette. I’ve had a lot of fun doing this style of turning and hope you will also. There are a lot of options. You can rotate each piece 90 degrees and turn the combination four times. This method turns four pieces that are off center but exactly alike. You can paint, carve, or burn the inside before the reassembly. Use your imagination and have fun!



Photo 2. A finished piece.



Photo 3

Inside-Out Turning Resources

Better Homes and Gardens, Wood-Turning techniques, Pg.62, split turned vase

Woodturning Magazine, Vo. No. 45 Pg. 52, Inside-out vase

Woodturning Methods, Mike Darlow, Pg. 118, Inside-out Turning

The best from Woodturning Magazine, Faceplate Turning, Pg. 66 turning inside-out Platters

The best from Woodturning Magazine, Spindle Turning, Pg. 85, Inside-Out Christmas Ornament

The best from Woodturning Magazine, Useful techniques for woodturning, Pg. 94 Involute Turning-90 degree turning

American Woodturner, AAW project Book, Pg. 52, Inside-Out Christmas Ornament