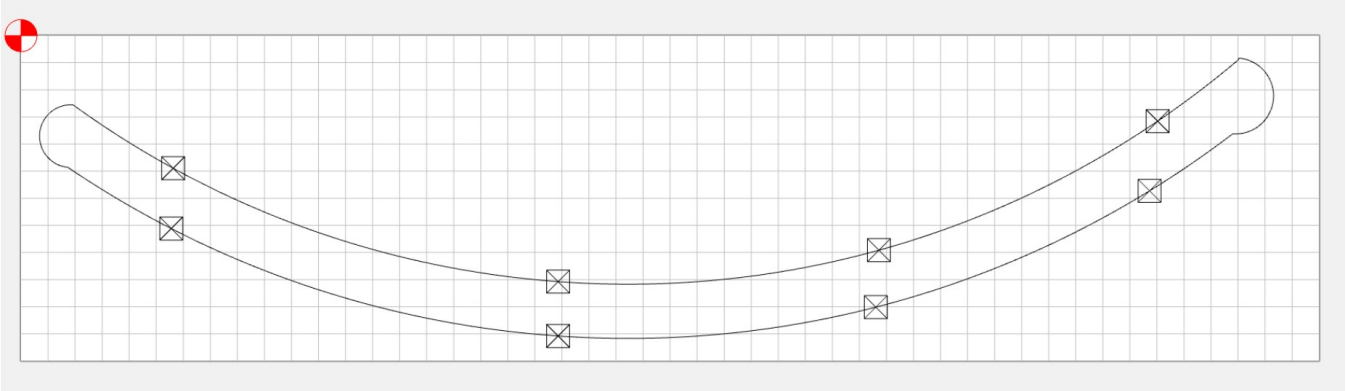
My First Tiling Job
Shapeoko SO3 XXL
Guy Donham January 20, 2025
Carbide Create 778 Pro

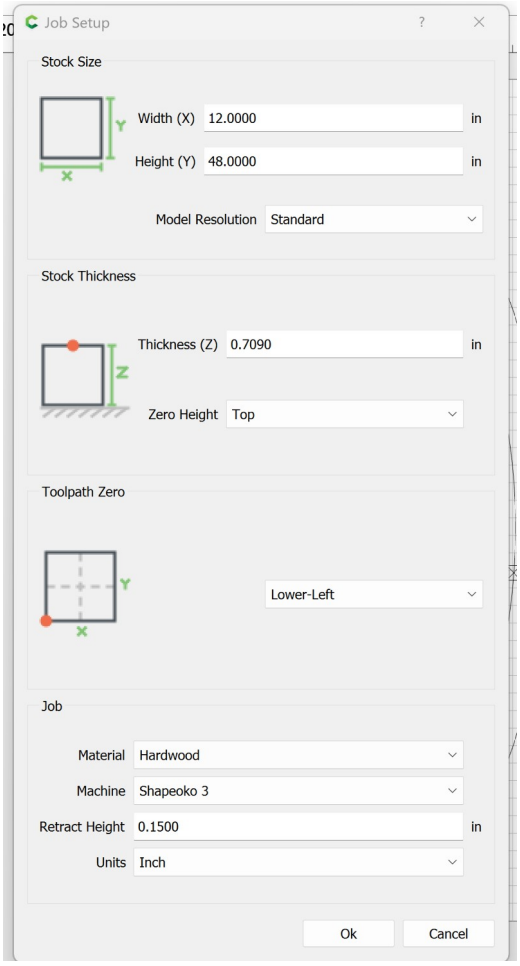
This is to document my first Tiling job on my SO3. A friend asked me to make some rockers for a rocking chair he has made. The rockers he cut out on his bandsaw were rocking very roughly. So I did some research about how to design a rocker from scratch.

The advise I found was to make the rockers from 36” to 48” radius. Then you need to measure the base of the chair front to back. In my case the chair was 27”. So you add about 12” to the rear and about 4” to the front so that equaled 43”. Since this is only a prototype made of plywood I made them 46” long. I then went into Carbide Create and created a circle 37” radius (bottom of rocker) and then a second circle 35” (top of rocker). I centered the two circles and created some circles larger than the 2” width of the rockers and placed them at the 46” marks and did several boolean operations to come up with this:

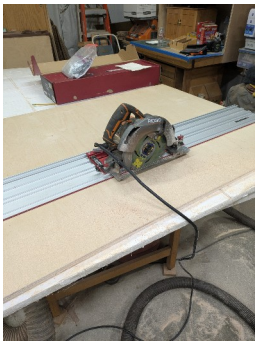


The circles were not necessary but I thought it would give you an indication that you were rocking too far and maybe keep you from turning the chair over. When I make the final rockers I will test out my theory about stopping and/or preventing you from over rocking the chair.

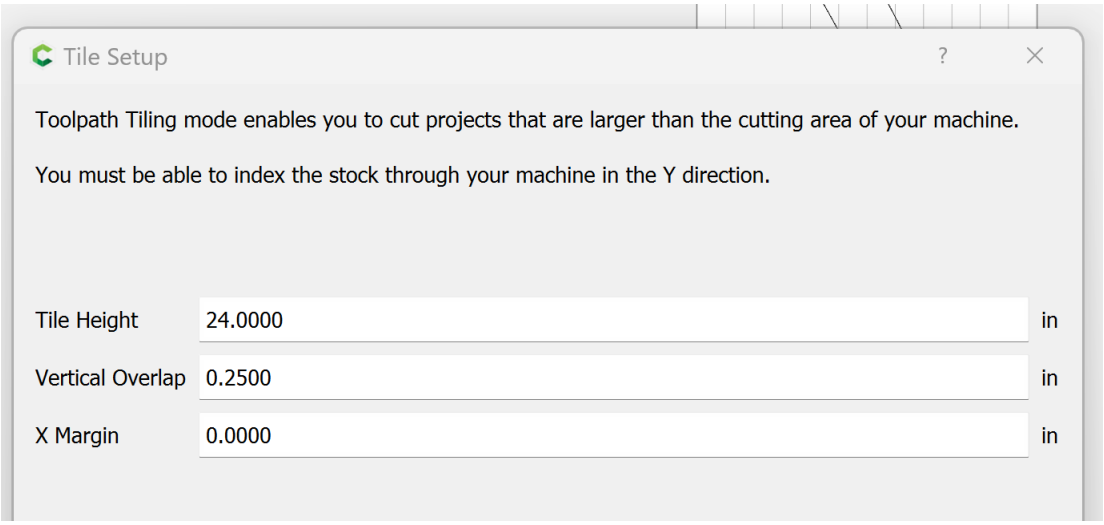
I determined the single rocker could be cut on a 12” X 48” and set that as my material setup.



I had bought some birch plywood that was made in Indonesia that only measures .7”. I used my new Milescraft Track Saw Guide to cut the plywood up into 12” strips across the 48” width. I have a large tablesaw but find it hard to handle full sheets of plywood by myself and this track saw worked perfectly. Under the material is a piece of 1” 4’x8’ foam. Dont cut through your foam.



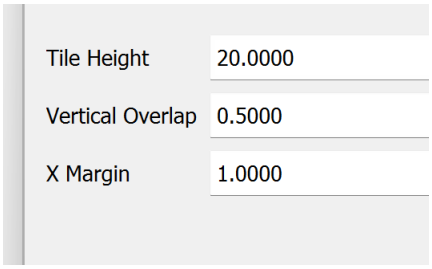
The 48” length is longer than my SO3 XXL so I made a tiling job. I highlighted my rocker and went to tool paths and selected an outside contour with the #201 upcut bit. I checked the “Toolpath Tiling (Pro)” box and I believe it defaulted to a 20” tile which would have required 3 tiles on a 48” length material. So I edited that to 24” so I would have 2 tiles and only have to move the material once.



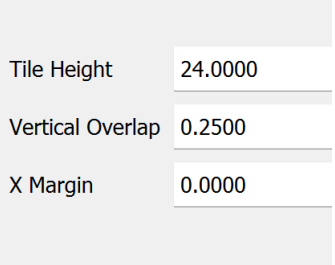
The Tile Height was set from 20” to 24”. I set the Vertical Overlap from the default .5” to .25” and set X Margin to 0.0”. The tile height made 2 tiles from my 48” material. The overlap was set to .25” because the margin of error if misaligned would be less than the default .5”. The X Margin is for horizontal panels and this was a vertical tiling job. I surmise that if you were creating multiple panels to hang on a wall (horizontal) you would set the X Margin to the spacing between the panels but I am not sure about that so please don’t quote me on that.

To create the tool path you must first check the “Toolpath Tiling (Pro)” to get the tiling parameters in the tool path. For the toolpath I selected contour outside. Then edited the tiling parameters as above. That gave me two panels.

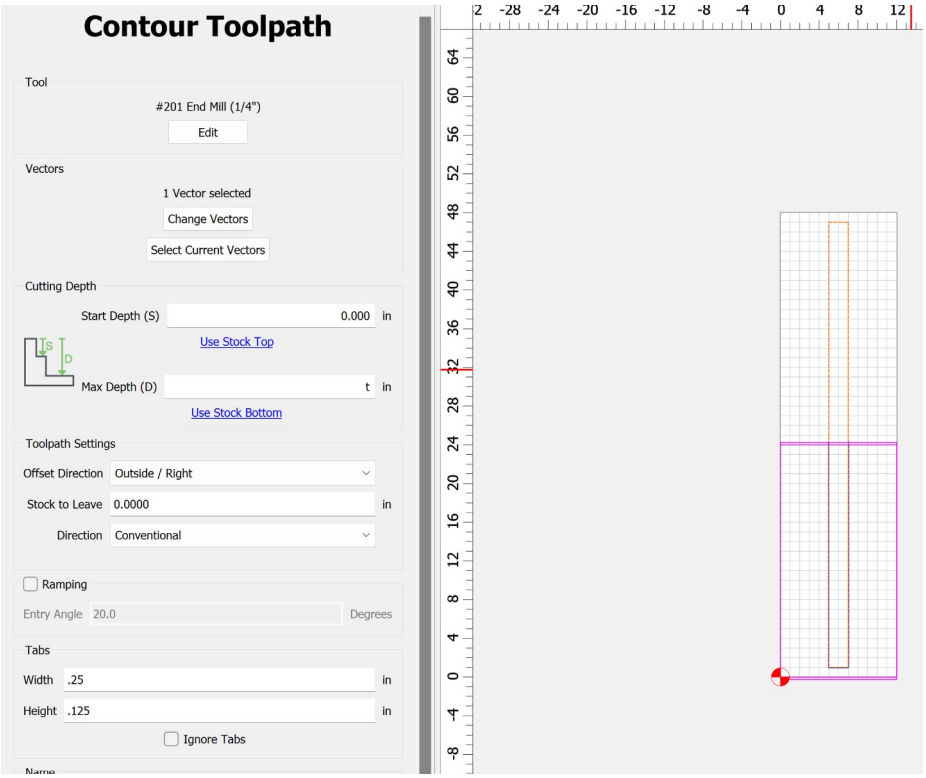
The default was 20” panel, .5” overlap and 1” X Margin.



I modified the setup as follows:

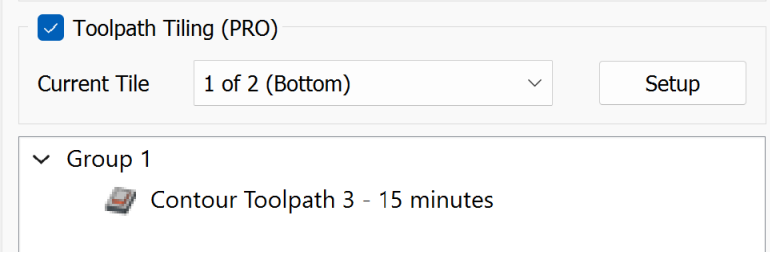


I then created a contour tool path cutting outside. I modified the tabs as well. I usually use painters tape and super glue but this would not work as well since I would be moving the material. So my plan was just to use clamps. I had made a left side fence I will discuss a little later.



After creating the tool path I saved the file as “rocker_tile1.c2d”. You have to save each tile as a separate file. Once the first tile runs the machine will stop and you move your material and load the second tile and so on and so on as many tiles as you make. In my case I have 2 tiles so I have 2 files “rocker_tile1.c2d” and “rocker_tile2.c2d”.

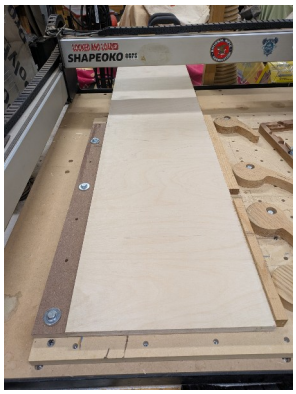
Make sure the tile 1 is selected before saving “rocker_tile1” and later select tile 2 before saving “rocker_tile2”

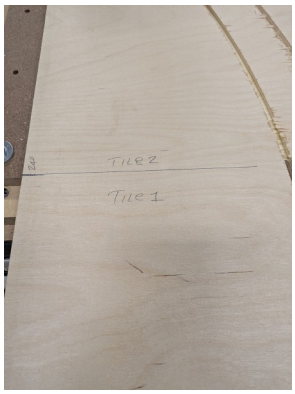


To register the tiling I created a fence that I bolted to my spoilboard. The fence was 2” wide and 25” long. The spoilboard I use has 1/4-20 tee nuts and on the left edge the spacing is 4” so I created .25” holes to bolt the fence down. I cut the fence holes on my SO3. After machining the fence I bolted it to the spoilboard. To make sure the fence was perfectly square to my router I set my Z zero to the bottom (top of spoilboard) and jogged my router over to the bottom right hand side of fence. I moved the router over in the X direction a little bit and jogged my router bit (#201) down to zero and then just jogged the router in the Y direction from end to end of the fence with the router turned on. I have a BitRunner so I had to turn the router on by the switch. If you don’t have a BitRunner just switch your router on. Just make sure you cut from one end of the fence to the other removing a small amount of material.

This ensured my fence was perfectly square to the router bit. Additionally I made a mark on the fence at 24” with a ruler, square and pencil. This mark is not necessary but gave me a visual reference of where the first tile would be cut. The fence was made of .5” mdf which was just scrap laying around the shop. Luckily making it out of .5” stock and my material being .7” my BitZero was able to be set on the corner of the material without the BitZero touching the fence. In this case it was a lucky accident. So consider the height of your material and if you can get your BitZero to sit on the lower left edge of the material to set X Y and Z zeros. Normally I use center of material and bottom of material as my X and Y and Z zero locations but in this case it was best to set my zeros at the lower left and top of material.

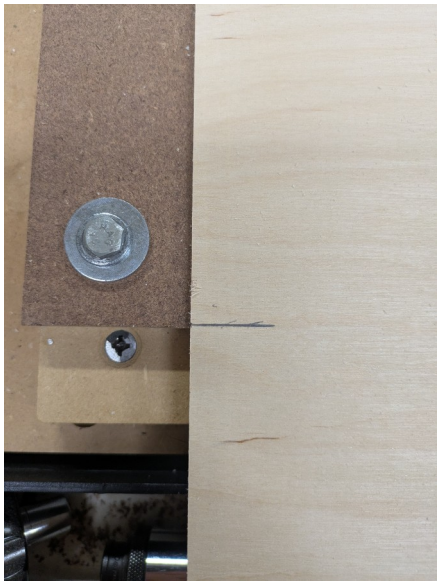
My files were saved and I was ready to machine the first tile. I opened Carbide Motion and put my #201 bit in the router. I then set my X Y and Z zeros using the lower left hand corner of the material and top of material. I had secured my material with my cam clamps against the fence and aligned the lower left corner of the material with the bottom of my fence. Just make sure whatever material clamping you decide on your material is secure. If your material moves during cutting the result will not be good.



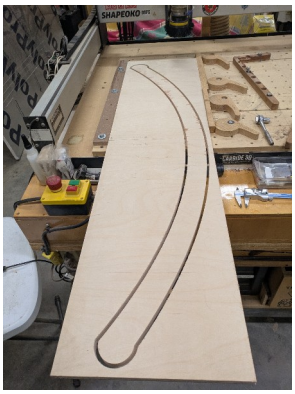


I loaded the file “rocker_tile1” into Carbide Motion and started the job. The tile 1 completed. The cutting was 24.25” long because I had set for a .25” vertical overlap. The tile was 24” long but the vertical overlap was added.

After “rocker_tile1” cut I moved the mark on the material located at 24” down to the front of my fence.



I then loaded the file “rocker_tile2” and because the X Y and Z were already set and I started the job.



The router cut .25” back inside the previously cut tile 1. This is the vertical overlap set in the tool path. You can decide how much overlap you want in the tool path tiling setup.

Here is the rocker cut out. I had to make 2 so I simply repeated the two files. Because I have a block in the middle of the back of my SO3 for my dust collection I had a choice to remove the dust collection or cut two separate files. A single 12” material size could pass through the back of my SO3. Had my SO3 not been blocked I would have made the material wider and cut both rockers in the same job. This was a choice for my machine conditions so decide for your setup. This tiling job is the reason so many people give the advise on tables and enclosures to put them on wheels and make the back of the

Shapeoko accessible so tiling jobs can be done. By having clear space behind your machine or the ability to move your machine you can do tiling jobs easier.

Here are both of the rockers cut.

This was my first tiling job and it turned out well. If these prototypes work I will cut the actual rockers out of 2” oak. I will use a different bit because the #201 does not have the capacity to cut 2” I have a Melin bit that will cut through 2” material.

During my research about tiling on the C3D forum some people referenced using pins. I did not quite understand the use of the pins. However my pencil lines worked well for this job. I will have to read more to understand the use of pins and/or dowels in registration of the tiles.

Here are the rockers with the tabs removed. I gave them a quick sand. In the pictures the bottom tile the birch plywood had practically no chip out on the top veneer. On the second tile the plywood chipped out a lot. On the first tile I was cutting cross grain but up the grain and almost no chipout but on the second tile still cutting cross grain of the veneer the chipout was bad. I think the reason is in the cross grain cutting against the grain the bit chipped the veneer pretty bad. On the finished product I will round over the edges with a ¼" bit so any chipout on the solid oak will likely be cut away. This is an example of why wood chips out.

This picture is of tile 1. No chipout.

This is tile 2 and there was a lot of chipout.

You can see that towards the top of tile 1 the chipout increases as the grain of the veneer was almost 90 degrees to the bit and increases in tile 2.