

Project Tutorial

Designs By Rick Frazier

Project: Cake Stand



In this project we will be creating a Cake Stand. We will introduce the setup and machining of a Cake Stand Spindle on the 4th Axis, two side machining and using Virtual Zero. The samples were made of cherry and walnut hardwoods, however, you might use woods of your own choosing. We recommend using any suitable hardwood. This is a nice project to do over a weekend and is an excellent introduction to the process of 2 sided and 4th Axis machining. The finished dimensions of the cake stand are 6" x 12".

Part of the preparation for this project is to thoroughly read and understand the instructions for the 4th Axis, virtual Zero setup and two sided machining. Depending on your machine and setup always run a test piece. I run all of my new projects on ridged foam before I commit to wood. I hope you enjoyed making your own Cake Stand.

Parts and Supplies

- 14"x14"x.75" Hardwood
- 10"x10"x.75" hardwood
- 2.75"x 2.75" x 7" hardwood
- Tapered Ball Nose - 15 Deg Tip 0.124
- 1/2 " Ball router Bit
- 1/2 Straight Router Bit
- 1/4 Spiral Router bit
- Sandpaper
- Dust Mask
- Finishing Materials

Files Needed

- Twisted post 2.crv3d**
- Twisted Post 21 Rounding.tap**
- Twisted Post 2 3D Finish 1.tap**
- Twisted Post 2 3D Roughing 1.tap**
- Twisted Post 2 Pocket 1.tap**
- Plate top_1.crv3d**



Preparing the Stock by Rounding 1

Project Tutorial

Designs By Rick Frazier

Plate_1.crv3d

Plate 3D Roughing 1.tap

Plate 3D Finish 1.tap

bottom Plate Profile 1.tap

Plate Pocket 1.tap

Base_1.crv3d

Base 3D Roughing 2.tap

Base 3D Finish 3.tap

Base Pocket 2.tap

Prepare the stock.

First we will do three glue ups for the top, post and bottom. Then we must prepare the stock for the post by running the rounding .tap program to prepare the square stock for machining.

We must first set up the 4th axis for the rounding procedure for the post. Use the instructions provided in the CNC files.

[CNCShark_4th_Axis_Quick_Start_Guide ver2.2.doc](#)



The

Twisted Post

The post on this project is an exercise with the 4th axis.

Running the Rounding tool Path

Using a .500" straight bit, the rounding tool path sizes your stock and prepares it for roughing of the post stock.

Running the Roughing tool Path

After you have run the rounding tool path, you change bits to a .375 round nose bit don't forget

to touch off the tool on the headstock and tail stock. Now run the Post roughing tap file.

Running the Finishing tool Path

As before after you have run the roughing tool path, you change bits to a Tapered Ball Nose - 15 Deg Tip 0.124 bit don't forget to touch off the tool on the headstock and tail stock. Now run the Post finishing tap file.

Running the Post Pocket tool Path

As before after you have run the finishing tool path, you change bits to a .500" straight bit don't forget to touch off the tool on the headstock and tail stock. Now run the Post pocket tap file.

The Base Plate

The Base plate is a one sided project using Virtual Zero.



Running the Roughing tool Path

Now you can setup for a one sided machining of the base of our project. You put your 10"x10" blank on your machine bed, change bits to a .500" round nose bit, now go through the procedure of the touching off the bit in Virtual Zero, if you're not using Virtual Zero touch off as you normally do. Now run the Base 3d roughing tap file.

Project Tutorial

Designs By Rick Frazier

Running the Finishing tool Path

As before after you have run the roughing tool path, you change bits to a .250" round nose bit, now go through the procedure of the

touching off the bit in Virtual Zero, if you're not using Virtual Zero touch off as you normally do. Now run the Base 3d finishing tap file.

Running the Pocket and profile tool Paths

In this step we are machining the pocket for the post and cutting out the base. As before after you have run the Base 3d finishing tap file, you change bits to a .250" straight bit, we are now going to run the pocket and profile tool paths, touch off as you normally do. Now run the Base pocket and then base profile tap files.

The Plate

The Plate is a two sided project using Virtual Zero. We will also be machining a pocket in our sacrificial board to locate the plate for machining the 2nd side.



Running the Roughing tool Path

Now you can setup to machine the bottom of our plate. You need change bits to a .500" round nose bit, now go through the procedure of the touching off the bit in Virtual Zero, if you're not

using Virtual Zero touch off as you normally do. Now run the plate 3d roughing tap file.

Running the Finishing tool Path

As before after you have run the roughing tool path, you change bits to a .500" round nose bit, now go through the procedure of the touching off the bit in Virtual Zero, if you're not using Virtual Zero touch off as you normally do. Now run the Plate 3d finishing tap file.

Running the Pocket and profile tool Paths

In this step we are machining the pocket for the post and cutting out the base 1/2 way through. As before after you have run the Plate 3d finishing tap file, you change bits to a .250 straight bit, we are now going to run the pocket and profile tool paths, touch off as you normally do. Now run the Plate pocket and then plate profile tap files.

Running the Pocket tool Path for our locating pocket on the spoil board



Now you can setup for the second side machining of the plate of our project. Remove your plate and prepare to flip it on the x-axis. You need to machine a pocket in your spoil board to locate our plate on center you change bits to a .250 straight bit, we are now going to run the pocket tool path, touch off as you normally do on your spoil board .

Project Tutorial

Designs By Rick Frazier

Now run the Plate pocket tap files again. This should give you a pocket on center to locate our plate.

Running the Top Pocket and profile tool Paths

In this step we are machining the Top of our plate and cutting free our plate. As before you change bit to a .500" straight bit, we are now going to run the top pocket tool path, touch off as you normally do. Now run the Top Plate pocket tap files. After that is completed we are now ready to complete cutting free our plate by running the top profile tool path.

Step 3 Sand and Finish.

To finish the project , sand all pieces to 240 grit sandpaper spray on a light coating of

polyurethane lightly sand again and spray 2 or more coats of polyurethane.

STEP 5 Assembling the Parts.

Apply Glue to the tendons of the post and insert them into the top and bottom mortises. Align the grain off the three parts to get a pleasing orientation.

IN CONCLUSION

Part of the preparation for this project is to thoroughly read and understand the instruction for the 4th Axis. The skill sets learned are 4th axis machining, 2 sided machining and 2 side setup. I hope you enjoyed making your own! You can customize the project using the editing tools in your Vectric software, if desired.