



Rotary Practice Project Using VCarve Desktop



Standard 4th axis



Mini 4th axis

To Our Customers

Thank you for purchasing the Rotary 4th Axis accessory. Your Rotary 4th Axis brings the speed and precision of Rotary CNC to your shop and greatly expands the capabilities of your CNC machine.

This manual provides setup, operational information for your Rotary 4th Axis. Please read the manual carefully. This manual also includes our warranty (page 7) and important safety information (page 5).

This manual has been written with the assumption that the owner is familiar with the basic operation of a computer as well as the required technical knowledge required for the safe operation of woodworking power tools. Information in this manual is subject to change without notice.

This manual is also written under the assumption the owner has spent time learning how use Vectric the VCarve or Aspire software that is used to create the toolpath files used by your CNC machine and Rotary 4th axis. Again, thank you for purchasing the Rotary 4th Axis. We are confident you will be pleased with its performance and ability to create a wide variety of projects and materials.

If you have **questions or comments**, please contact us at : Next Wave Automation, LLC, 600 W. Boundary St., Perrysburg, Ohio 43551 USA, Phone – (419) 318-4822, or email us at: info@nextwaveautomation.com

For **Technical Support** please: email us at: support@nextwaveautomation.com, or visit our Support page at: www.nextwaveautomation.com/support For the fastest service please include your product model number, date of purchase, and any pertinent information that may be helpful such as .tap files, VCarve files, screen captures, and photos of your setup or problem.

Visit us on the web at: NextWaveAutomation.com

Owner manual updates

This manual will be periodically updated. For the most recent version visit:

www.nextwaveautomation.com/downloads-links

Controller, Pendant and Firmware updates

For the most recent version visit:

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- IMPORTANT -



Refer to the full "Rotary 4th Axis Owners Manual " for complete instructions on installing and aligning the Rotary 4th Axis on the CNC Shark or CNCPiranha. Creating a practice project with VCarve Pro is also covered in the main manual.

TECHNICAL SUPPORT

Next Wave is committed to helping you get your Rotary 4th axis up and running as quickly as possible. If you experience any difficulties please contact our technical support team:

On the web at: <https://www.nextwaveautomation.com/support>

By email at: support@nextwaveautomation.com

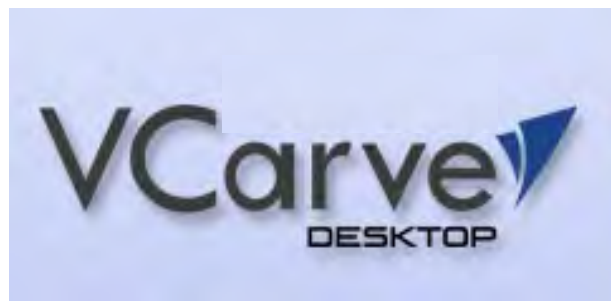
By phone at: (419)491-4520 during Mon-Fri 9AM-5PM Eastern time zone

Rotary 4th Axis Workflow (Basic Practice Project) Using VCarve Desktop



The following instructions walk through the steps of creating a simple fluted cylinder. This exercise assumes you are familiar with how to navigate and create basic designs in VCarve. If you are not familiar with VCarve, we suggest you visit www.vectric.com and familiarize yourself with VCarve before proceeding with this rotary project.

- **This manual covers the Design process when using VCarve Desktop**
- **The machine setup and machining steps are the same for both the Standard and the Mini 4th Axis.**
- **If you are using VCarve Pro, see the full manual for instructions on using VCarve Pro**



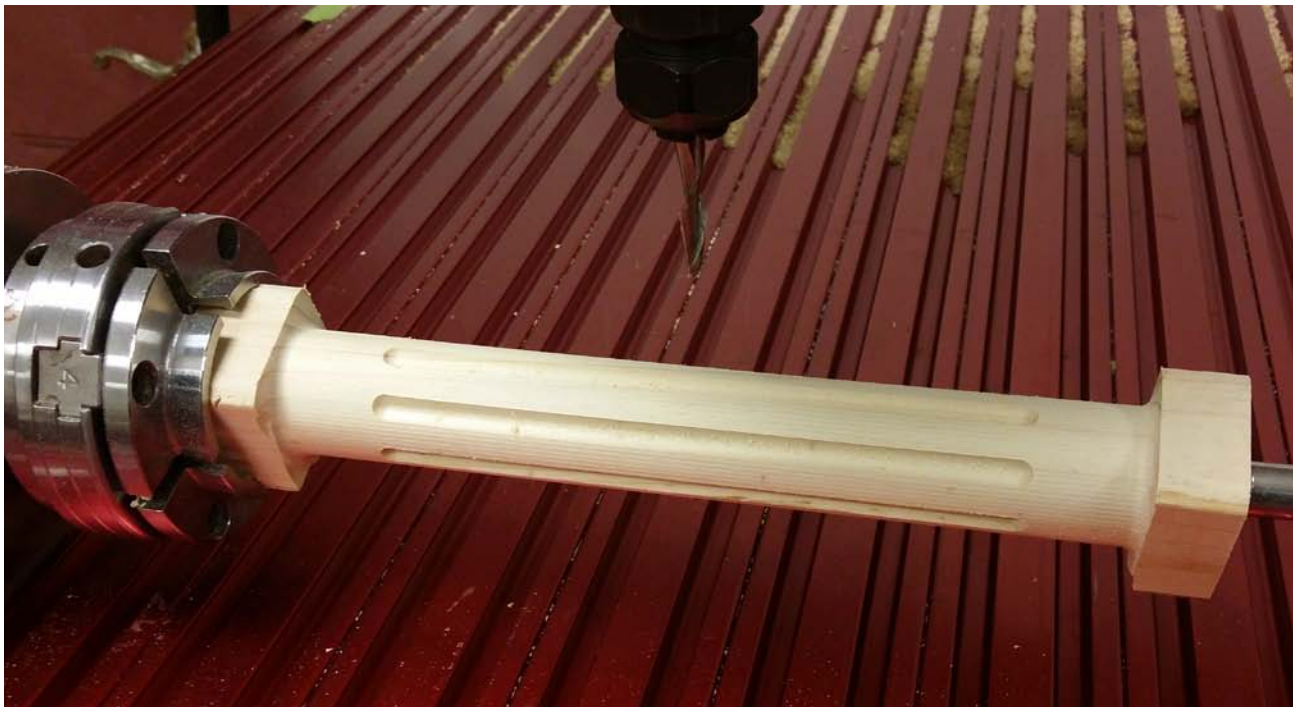


Design phase – Using VCarve Desktop

The following instructions show the basic steps of creating simple fluted cylinder using **VCarve Desktop**. These instructions may appear complicated, but once you go through the process a couple times, you will find that the workflow for rotary is very similar to the workflow for regular CNC projects. If you not used VCarve Desktop, we suggest you visit www.vectric.com and familiarize yourself with VCarve Desktop before proceeding with this rotary project.

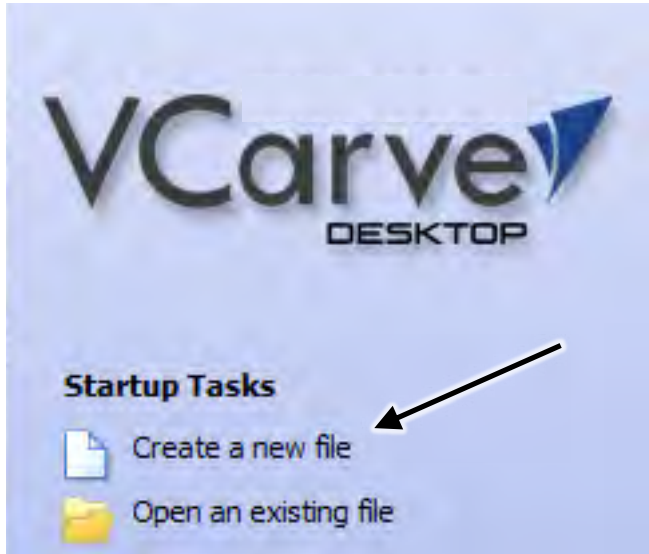


For this project you'll need a 1.5" x 1.5" x 10" piece of material for the workpiece.



Finished project

Design phase – Using VCarve Desktop

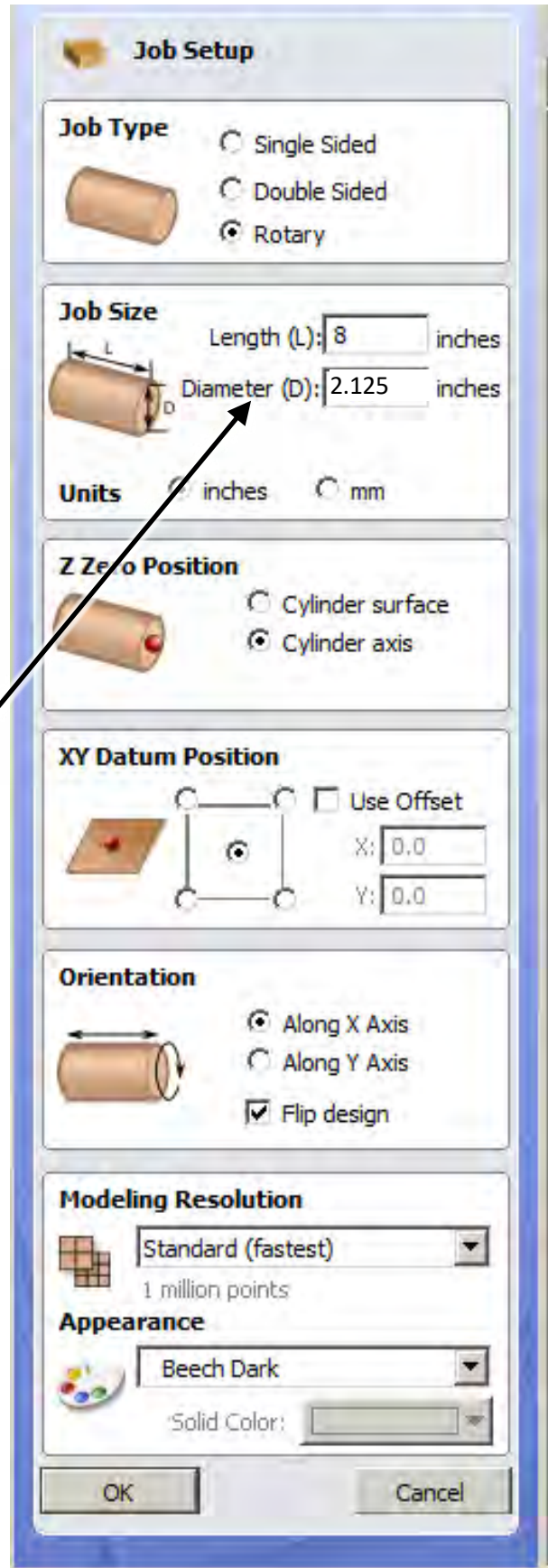
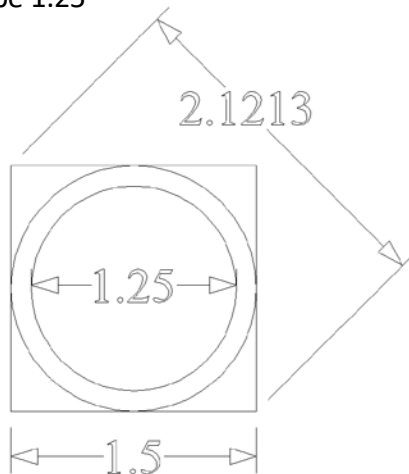


Step 1 – Create a new project

Step 2 – Match the settings in this Job Setup window.

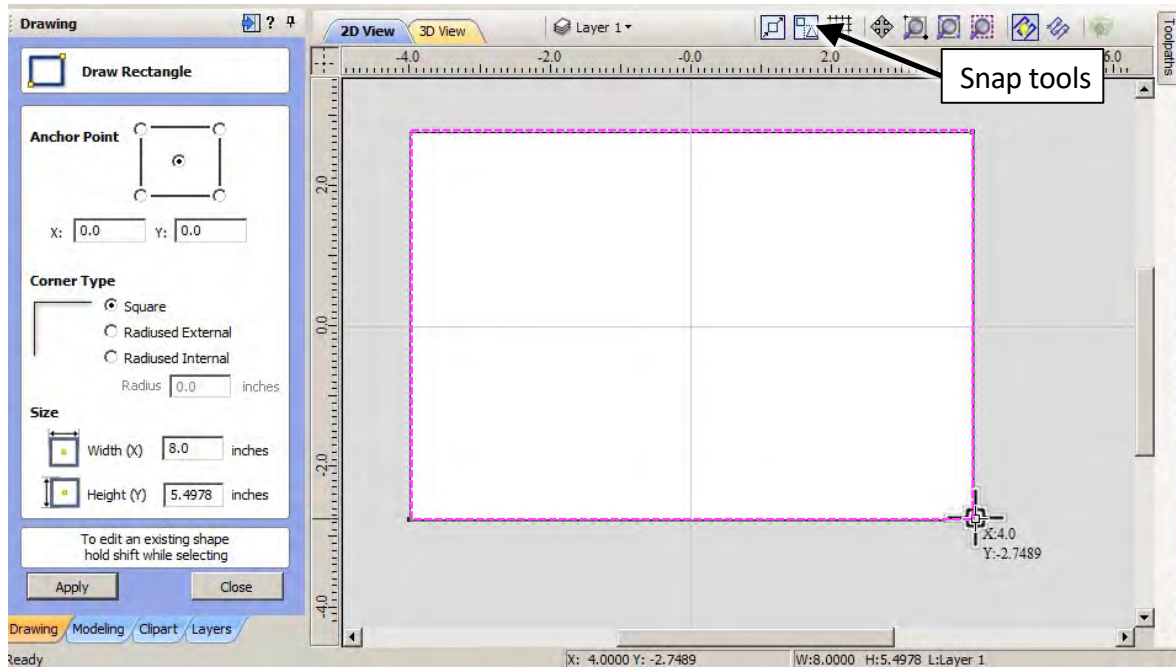
SPECIAL NOTE about the setting the Job Size Diameter.

If you're starting with round stock set the Diameter to the diameter of your round stock. BUT if you're starting with square stock (as in this project) set the diameter to the diagonal dimensions of your stock. Rounding off the number to the nearest 1/8" is OK. For this project that equals 2.125". The final project diameter for this project will be 1.25"

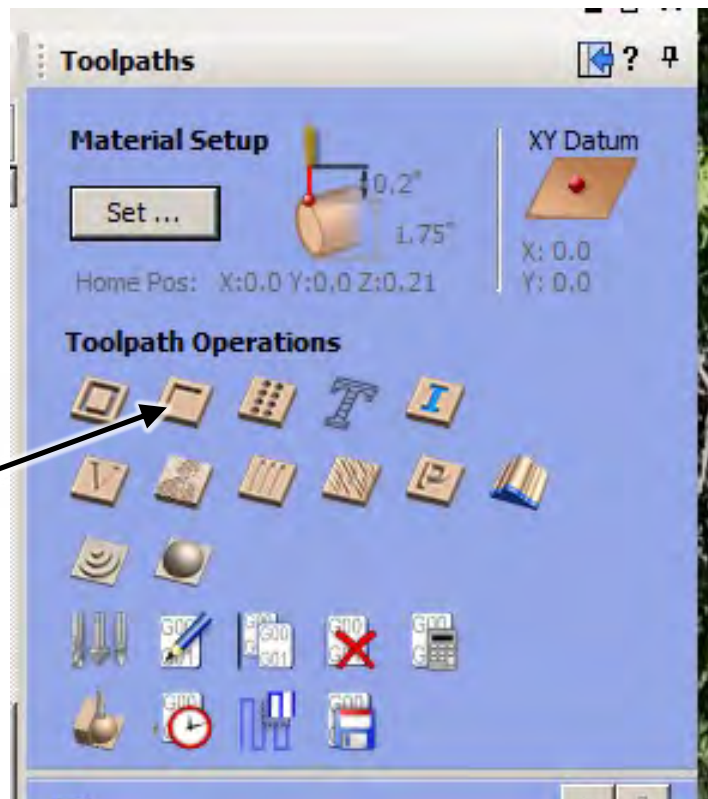




Design phase – Using VCarve Desktop



Step 3 – Draw a rectangle around the perimeter of the material. You want this rectangle to be the same size as you're the material. **TIP:** Using the snap tools to makes this easy. This rectangle will be used to create a "rounding" and "smoothing" toolpath that machines the square stock down to a round cylinder.

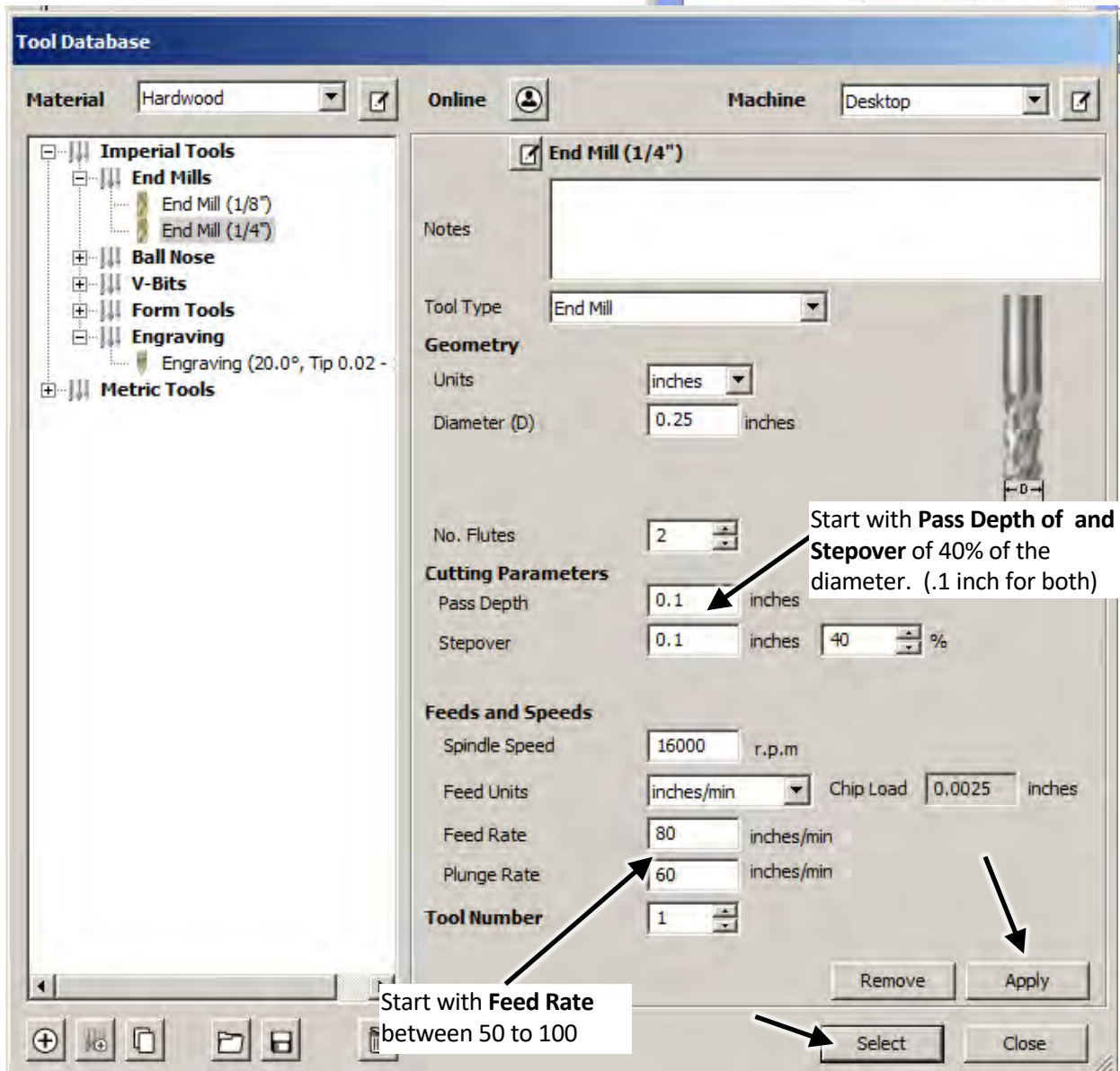
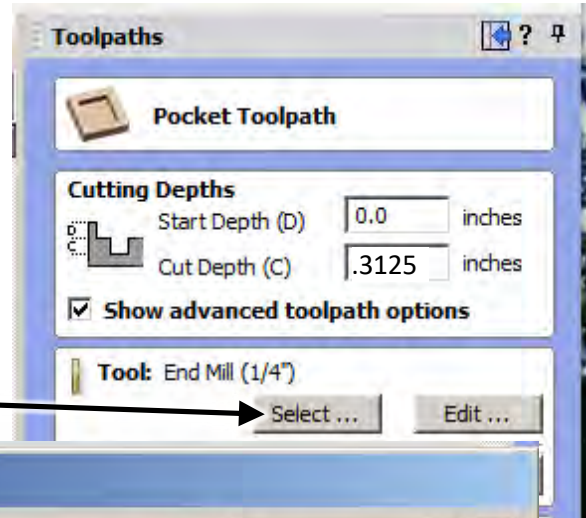


Step 4 – Next we will create a toolpath to round the square stock. Open the **Pocket toolpath tool**.



Design phase – Using VCarve Desktop

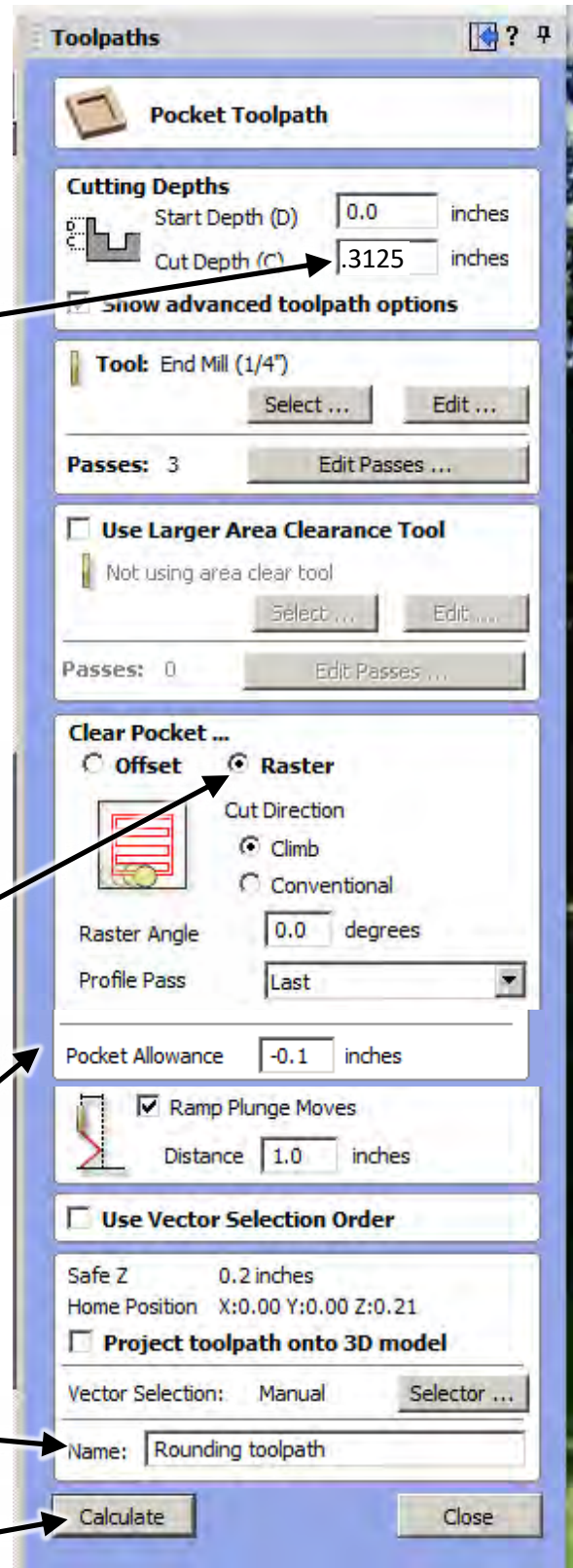
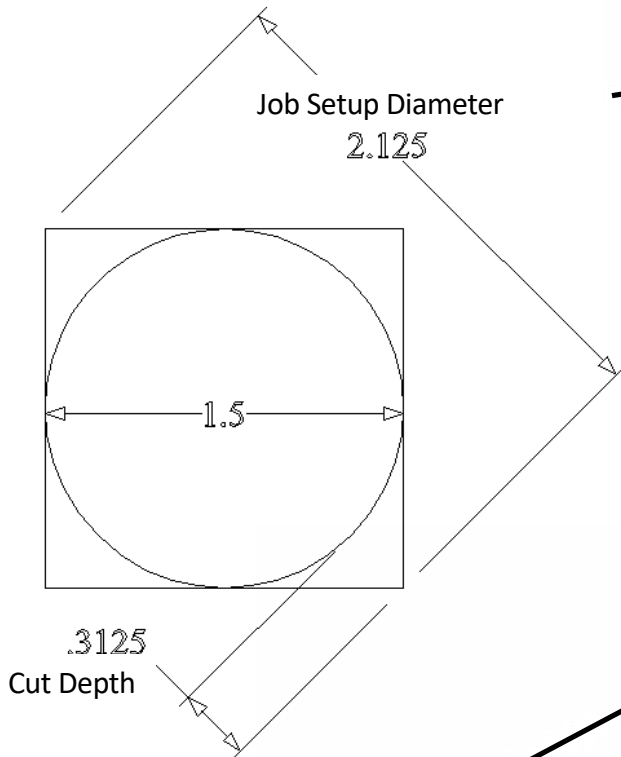
Step 5 – Click Select to open the Tool Database. Select a .25 endmill for this "rounding" toolpath step. The **Pass Depth**, **Stepover** and **Feed Rate** will depend on the type of wood you're cutting. Harder materials require shallower cuts. Run some test to determine the best settings for your situation. Once your bit is setup click **Apply** and **Select**.





Design phase – Using VCarve Desktop

Step 6 – Set the **Cut Depth** to .3125 (3/16) inches, This will knock off the corners and leave a 1.5 inch in diameter cylinder. It will have some rough texture on the outside since this is only the roughing/rounding pass.



Step 7 – Set to **Raster**

Step 8 – If needed, add some negative Pocket Allowance to ensure that the toolpath machines the entire cylinder. Or stretch the size of the perimeter rectangle

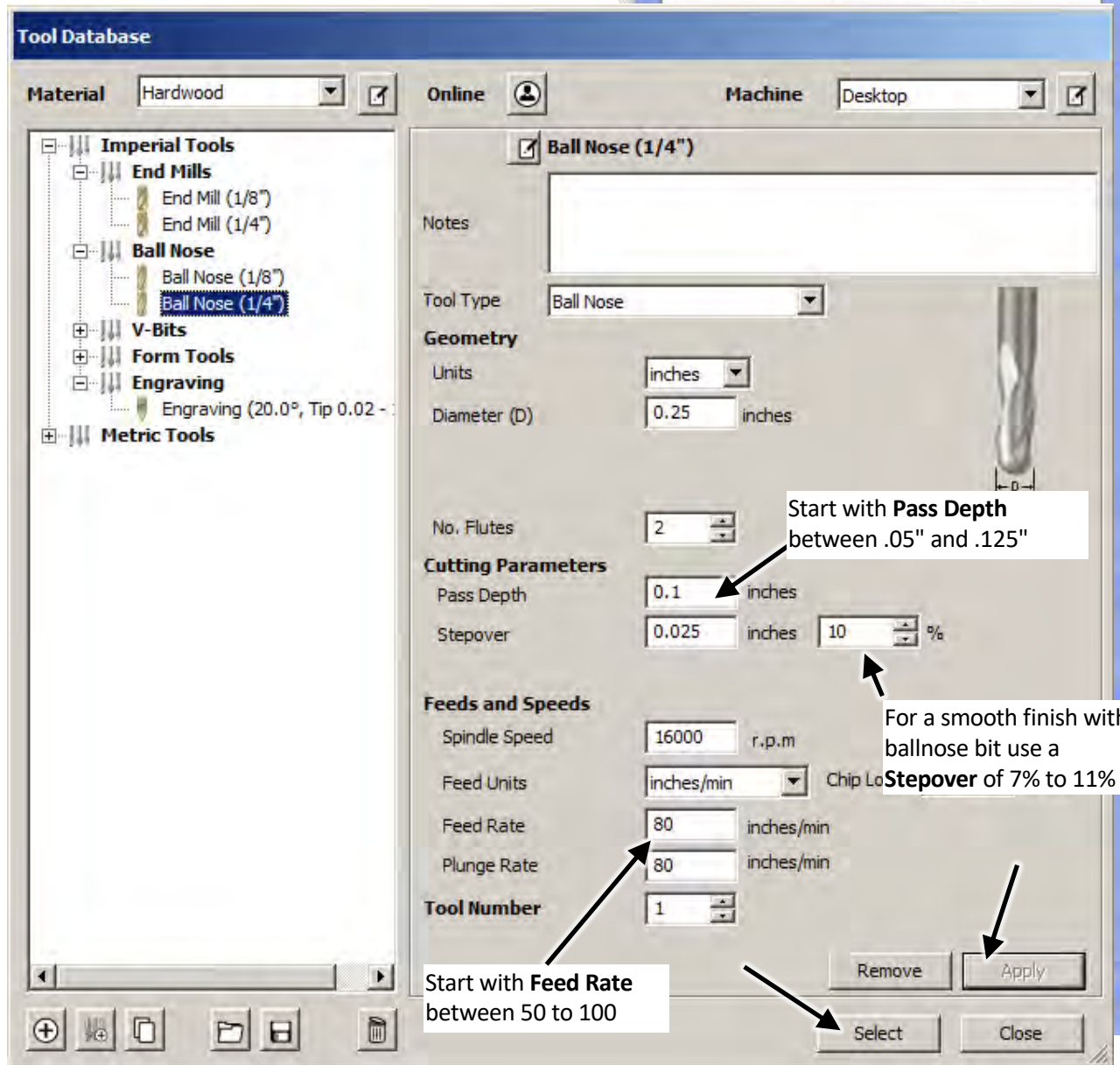
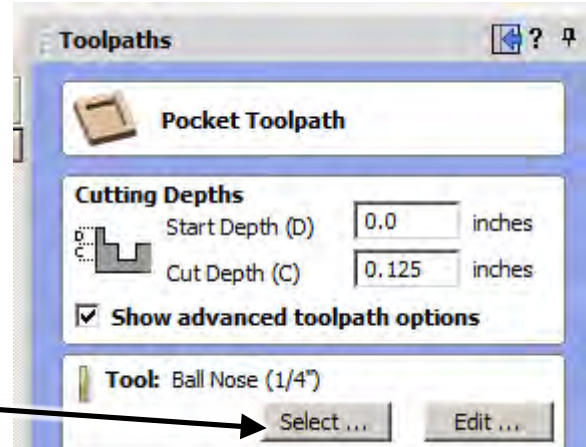
Step 9 – Add a **Name**

Step 10 – Make sure the Perimeter rectangle is selected, then click **Calculate**



Design phase – Using VCarve Desktop

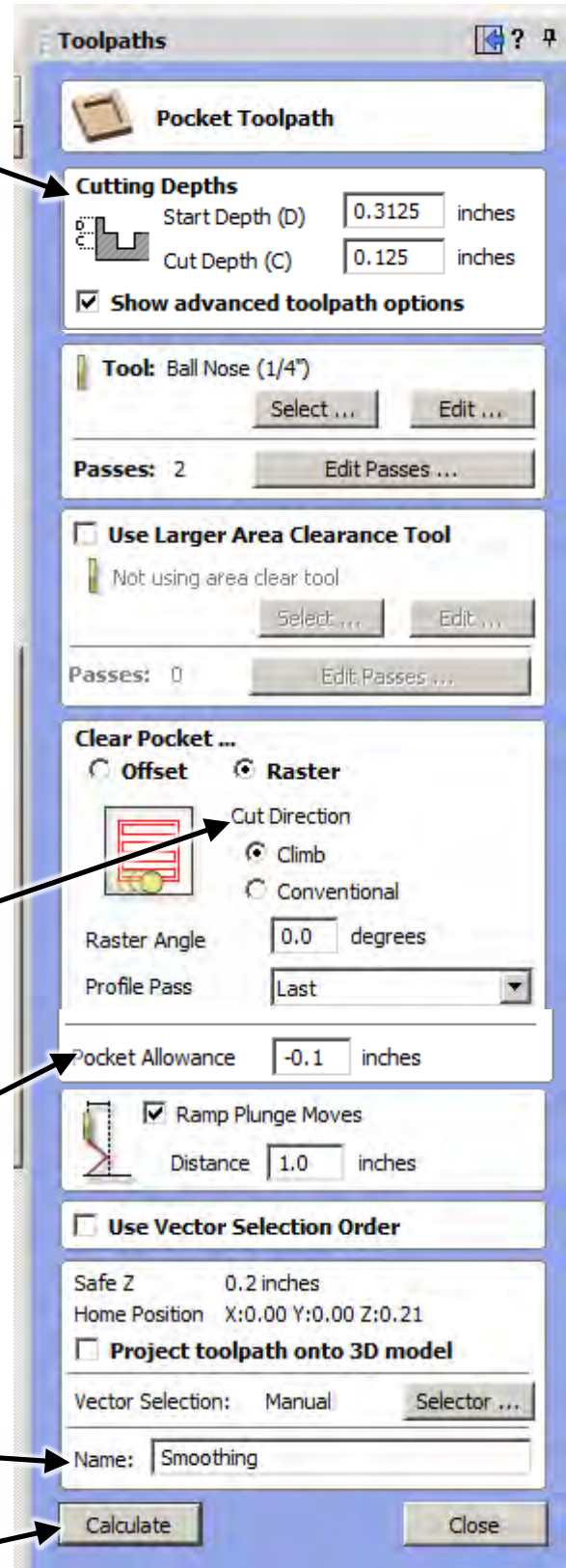
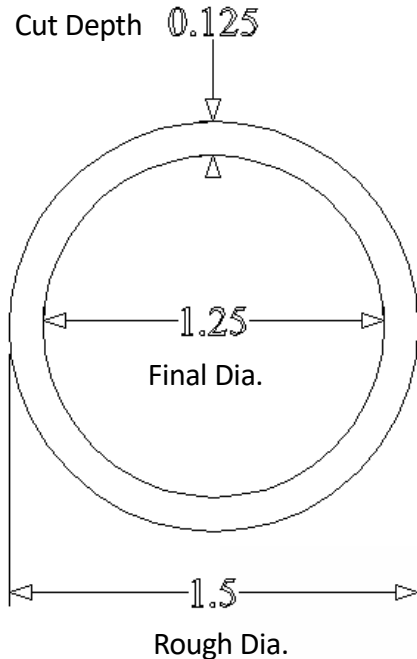
Step 11 – Open the **Pocket toolpath tool** again. This time we will create a toolpath to smooth the rough cylinder and reduce it to final diameter. Click **Select** to open the **Tool Database**. Select and setup a 1/4 inch dia. ballnose bit.





Design phase – Using VCarve Desktop

Step 12 – Set the Start Depth to .3125 (the Cut Depth for the Rounding toolpath) Then set the **Cut Depth** to .125 (1/8) inches, This will smooth the the cylinder to it final diameter of 1.25 inches.



Step 13 – Set to **Raster**

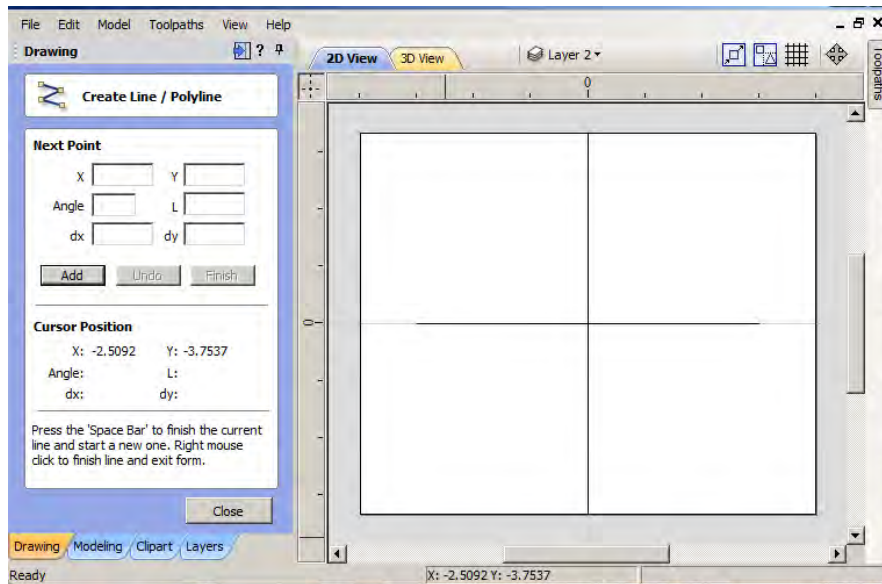
Step 14 – If needed, add some negative Pocket Allowance to ensure that the toolpath machines the entire cylinder. Or stretch the size of the perimeter rectangle

Step 15 – Add a Name

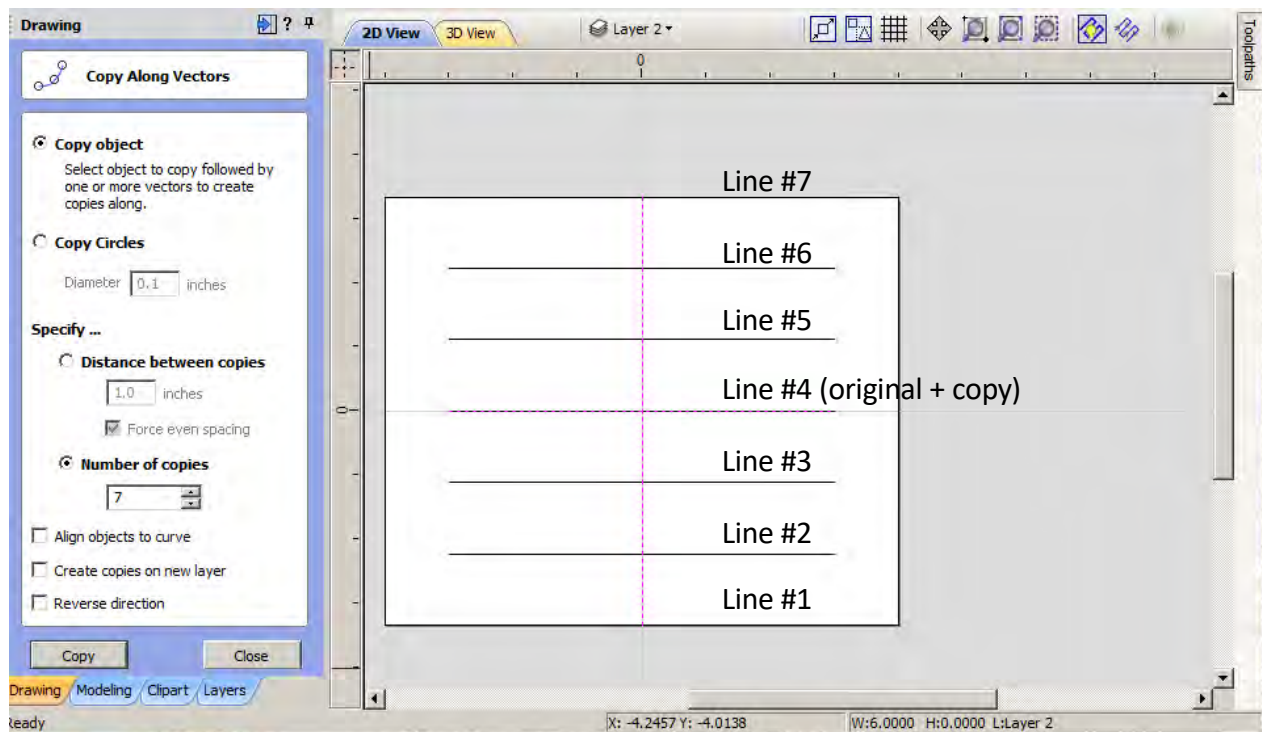
Step 16 – Make sure the Perimeter rectangle is selected, then click **Calculate**



Design phase – Using VCarve Desktop



Step 17 – Next we will draw the lines for the flutes. Start by drawing a vertical line that touches the top and bottom edge of the material. Next draw a 6 inch horizontal line in the center. This 6 inch line represents the length of the flutes.



Step 18a – Use the Copy Along Vectors tool to create 7 horizontal lines.

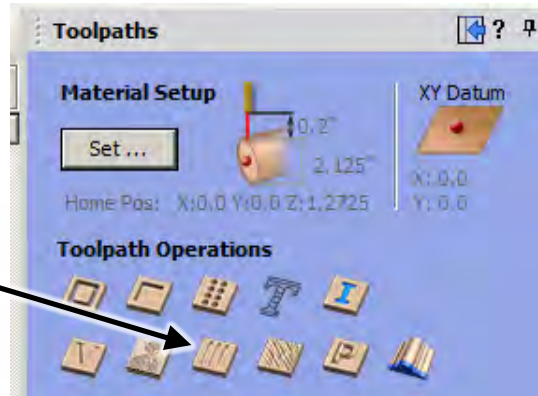
Step 18b – Delete line #7 at the top edge.

Step 18C – Delete one of the duplicate #4 lines and the vertical line
The remaining 6 lines will be used for the flutes.



Design phase – Using VCarve Desktop

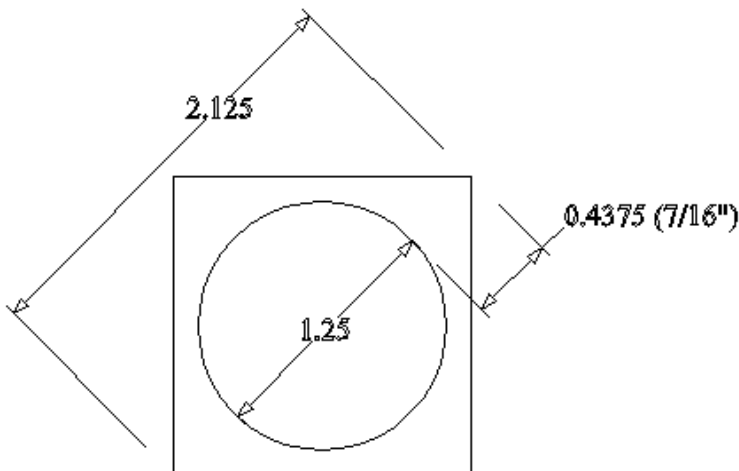
Step 19 – Open the fluting toolpath.



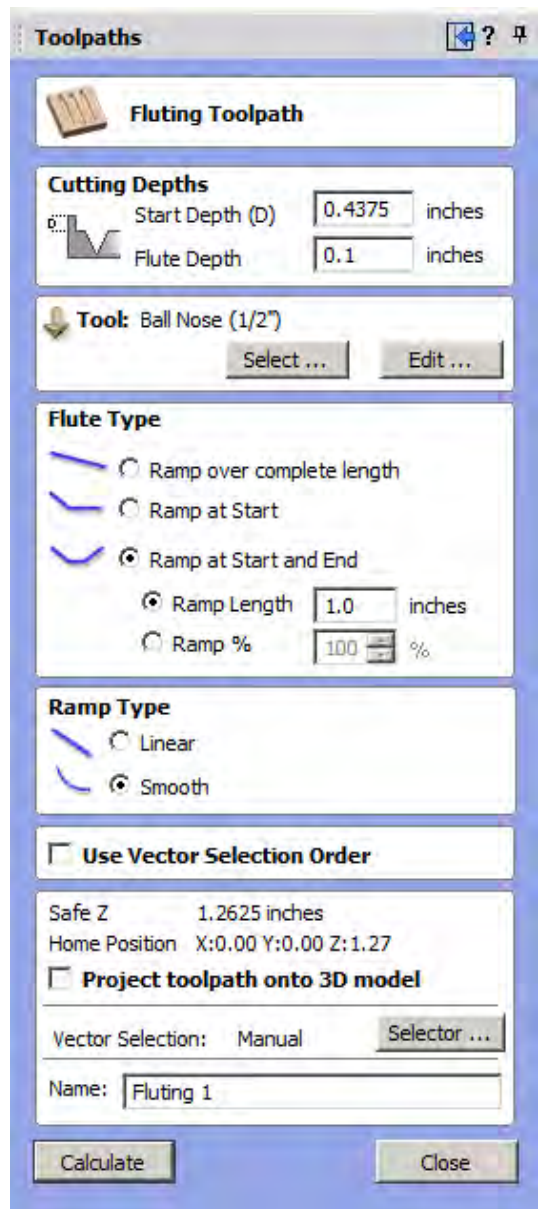
Step 20 – Set the **Start Depth** to half of the difference between the **Job Setup Diameter** and the smooth/final project cylinder diameter.

For this project that's $2.125 - 1.25 = .875 / 2 = .4375$.

Calculating the "Start Depth" this way is necessary because VCarve calculates the toolpath from the surface of the **Job Setup Diameter**.

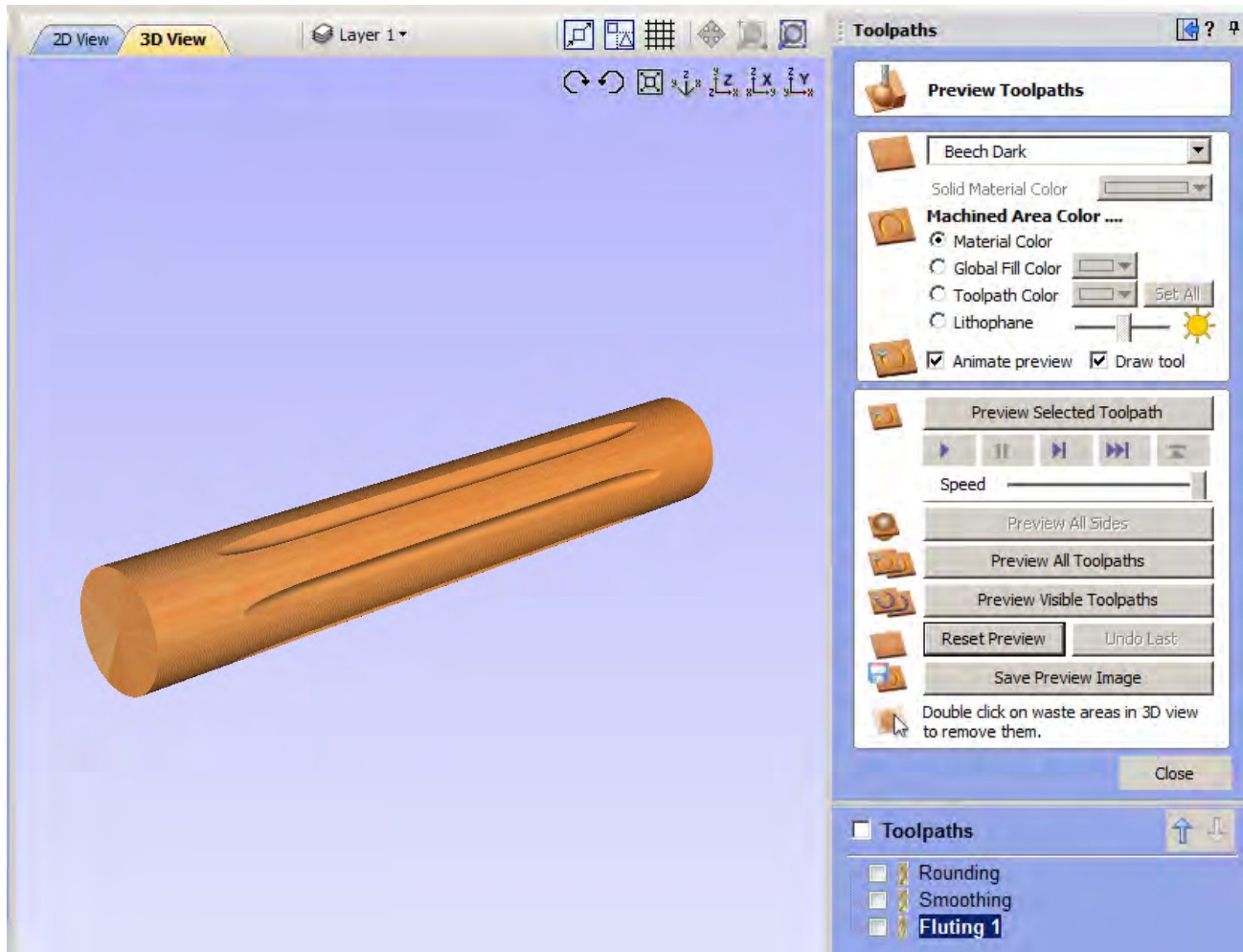


Step 21 – Set the remaining parameters as shown or as you prefer. Make sure the fluting lines are selected and then click **Calculate**.





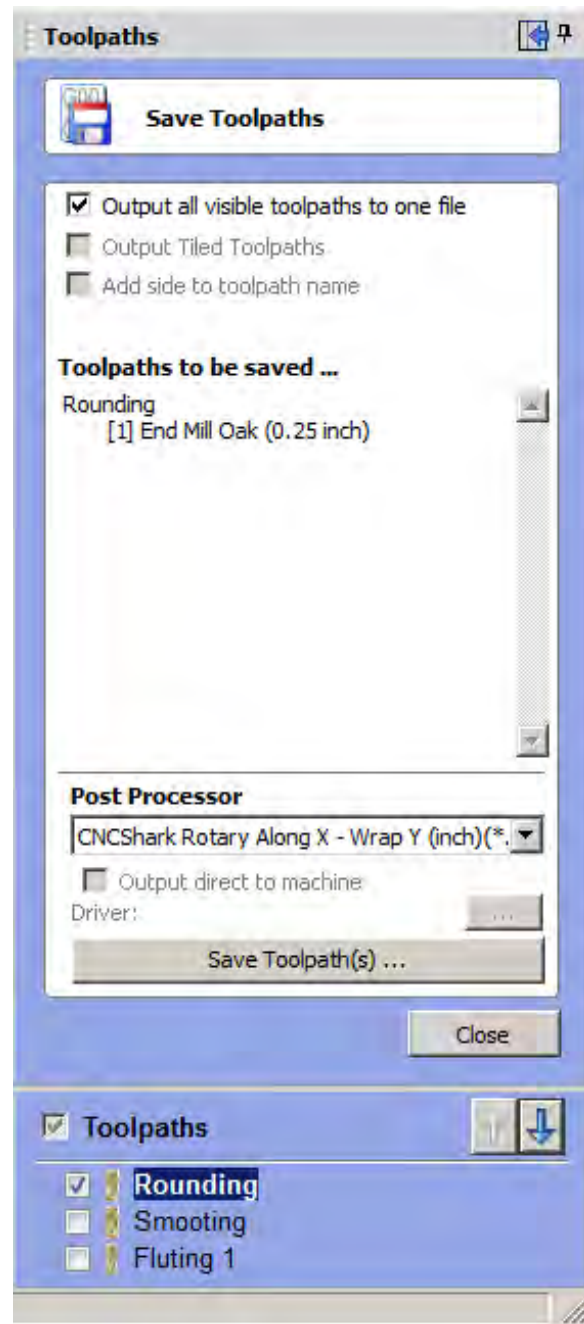
Design phase – Using VCarve Desktop



Step 22 – Preview All Toolpaths. It should look like the image above. If your preview doesn't match, review your steps and make the necessary corrections.



Design phase – Using VCarve Desktop



Step 23 –Use the **Along X – Wrap Y** post processor, and save the toolpaths to a thumb drive.

(NOTE: the name of most current post processor may vary from the one shown here.)

Step 24 –Refer to Page 62 in the main Rotary 4th Axis Owners Manual for steps on setting up and running this rotary . Tap file on your CNCSHark or CNCPiranha.

Rotary 4th axis tools are capable of creating a variety of decorative "in-the-round" projects. For more detailed information on creating advanced rotary projects and other CNC projects visit www.nextwaveautomation.com/cncprojectplans and www.Vectric.com



Rotary Practice Project Using **VCARVE Desktop**
October 02, 2019