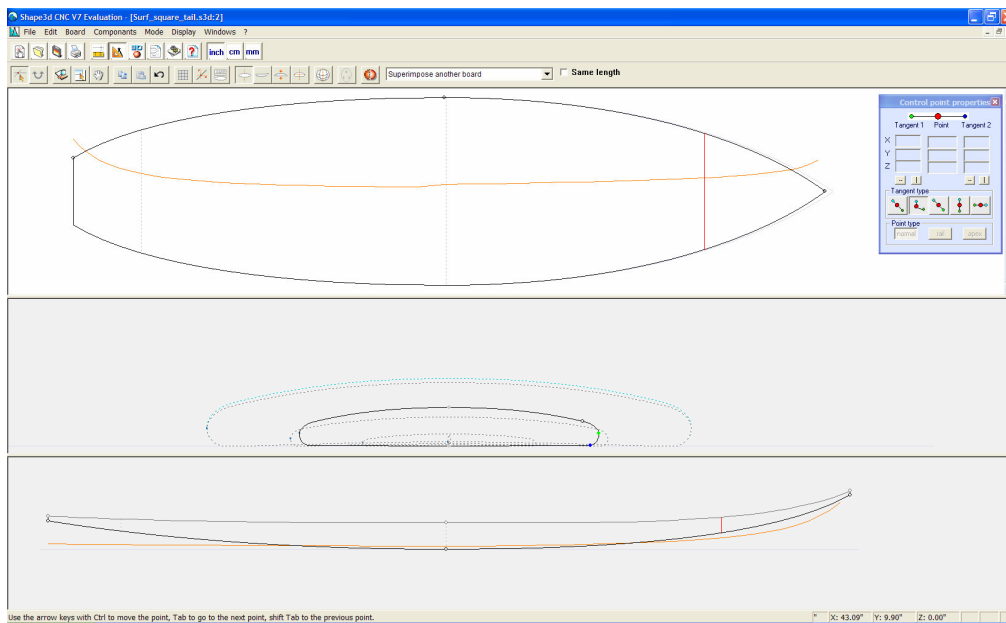


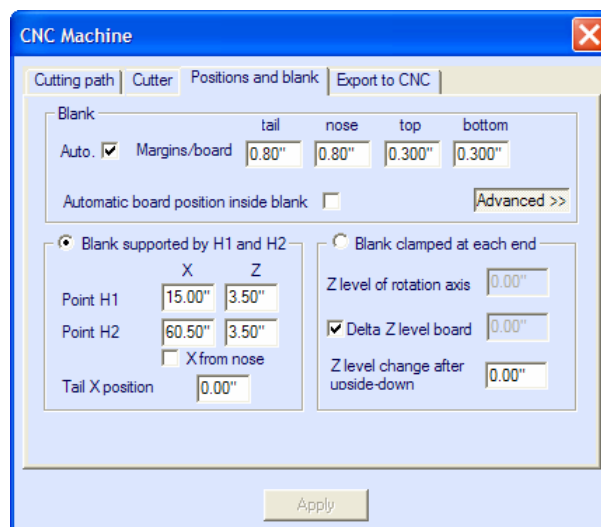
SHAPE3D CNC Tutorial

This is an easy step by step guide for using Shape3D in the CNC mode, for a 3-axis CNC machine.

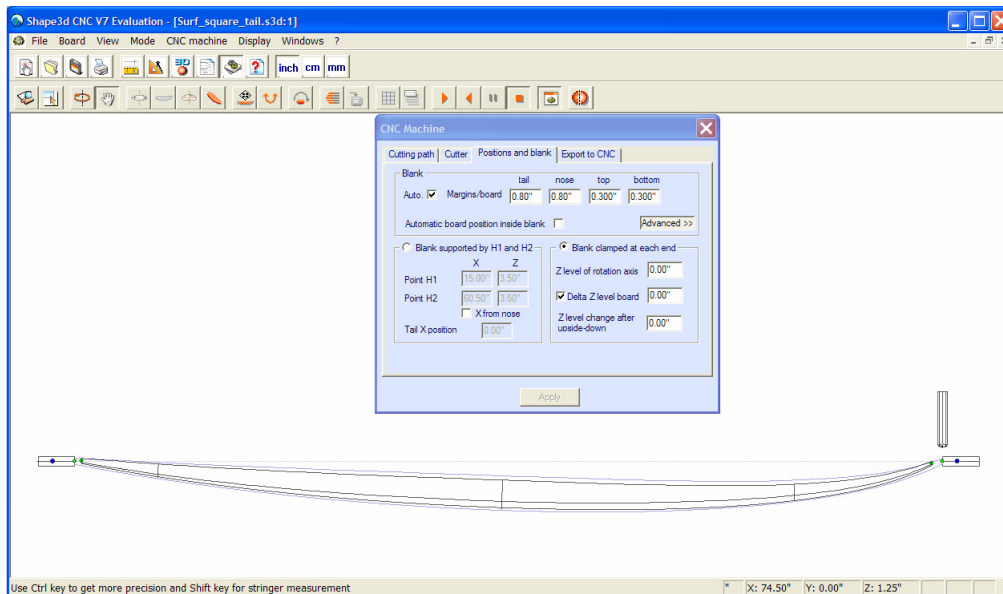
There are two ways for holding the blank: it can be either clamped at each end, or placed on two supports. These two possibilities are supported by Shape3D. We here try to give a tutorial for each.



Once you have designed your board, click on the CNC machine icon to enter the CNC mode. Then click on the CNC parameter icon to open the dialog box (seen below). In the "Position and blank" tab, you have the choice of either the "Blank supported by H1 and H2" or the "Blank clamped at each end" mode.

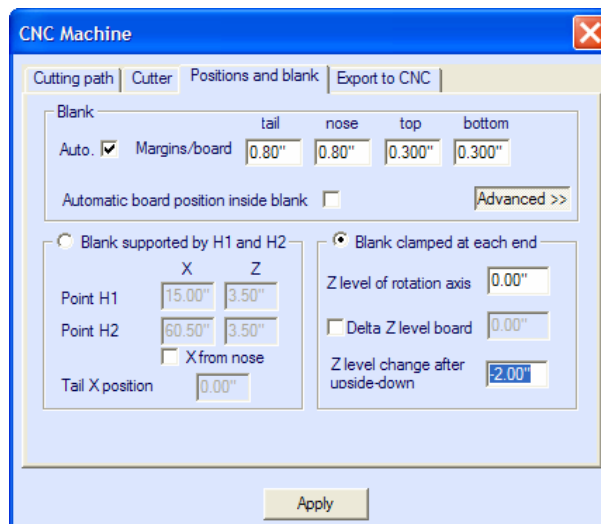


Clamp mode:



Still in the “Position and blank” tab,

- Choose the blank (automatic or not), and position the board inside the blank using the mouse or checking the “Automatic board inside blank” box.
- If you use the automatic board positioning inside the blank, you can tune the height of the board ticking the “Delta Z level board” box.
- If you have to change the level of the clamps after flipping the board, set the “Z level change after upside-down”.



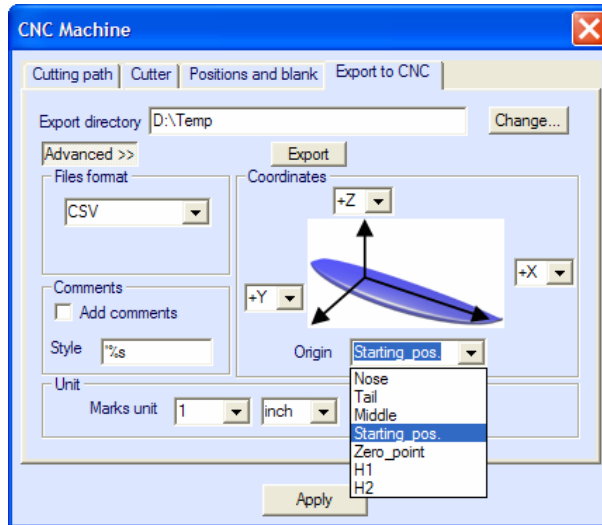
In the “Export to CNC” tab,

- Set the origin of the machine at the starting position. All the other possibilities are not very safe, since it is harder to locate the blank from your cutter origin.

The precision of the cutting lines rely on the location of this point. It is therefore it is very important that this point does not move when you switch from deck cutting to bottom cutting.

(if you have to drop the cutter into the blank on the deck ,or lift it ,for it to cut make sure you send it back to the original ,origin , if you don't, this will give you thickness variations.)

We will see in the following diagram that the origin can be defined and located precisely thanks to the starting point definition.



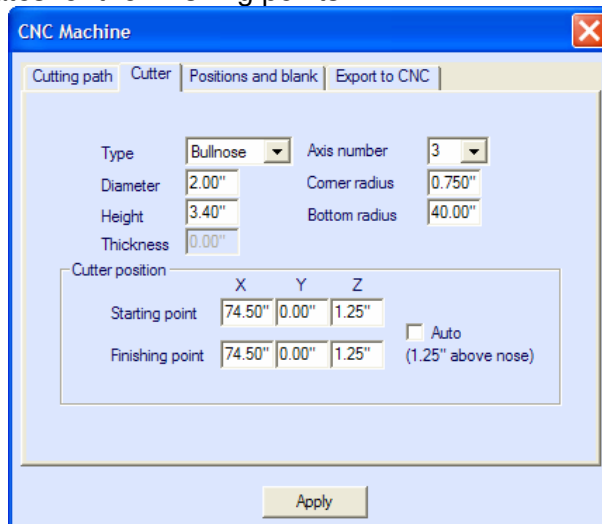
In the “Cutter” tab,

- Define the parameters of the cutter, and the number of axis of the machine (3).
- Set the starting point of the cutter.

You can either auto-set the starting position 1.25” above the nose of the blank (which is the nose clamp); this is a good choice since you know precisely where it is.

Or you might prefer another position (easy to locate precisely), for example 2.50” above (+z) the nose clamp and 3.00” behind (+x) (depending on how you set the coordinates.)

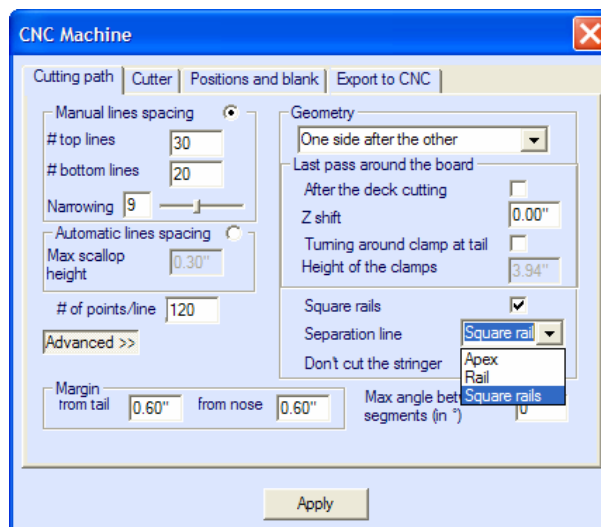
You can do it using the coordinates of the mouse cursor at the bottom of the screen. Set the same coordinates for the finishing points.



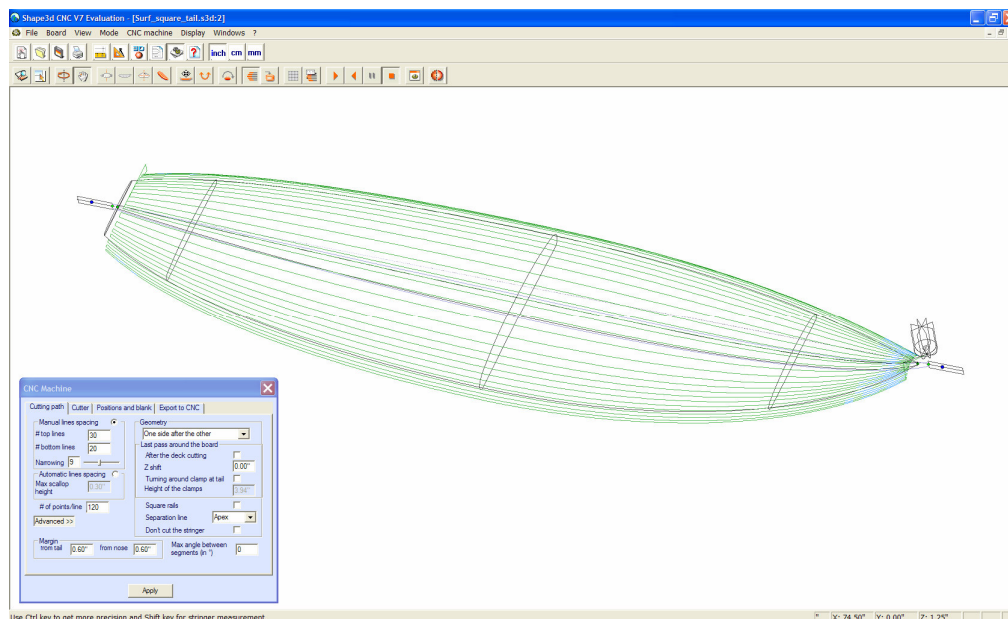
If you have set the origin of the machine at the starting point (as we advice), this position is where you must place the center of the bull nose at the beginning of the process, and then set this as the zero point of the machine.

In the “Cutting path” tab,

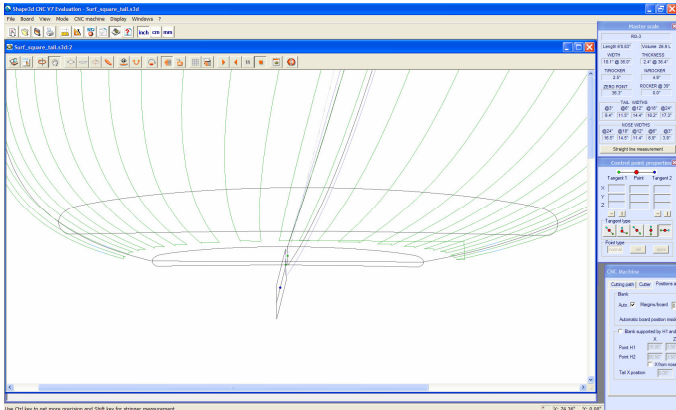
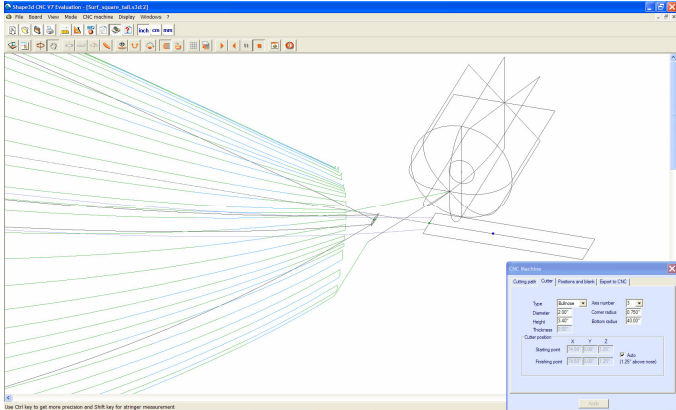
- Choose the number of cutting lines and their geometry. Note that you can automatically set the lines spacing that fixes the maximum scallop height to a chosen value. Also set the number of points per line, the larger the smoother.(but takes longer to compute.)
- Check the “Last pass around the board after the deck cutting” box if you don’t want the last pass to be done after the bottom cutting.
- Set the Z shift of the last pass around the board.
- Check the “Turning around clamp at tail” box if needed. Then give the height of the clamps.
- Set the separation line as the apex if you want the machine to cut the rails. If you want the rails to remain square, check the “Square rails” box. Note that in this latter case you must have defined the rail of the slices in the design mode.
- Check the “Don’t cut the stringer” box if needed.
- Choose a margin at the nose and tail.(see design manual)



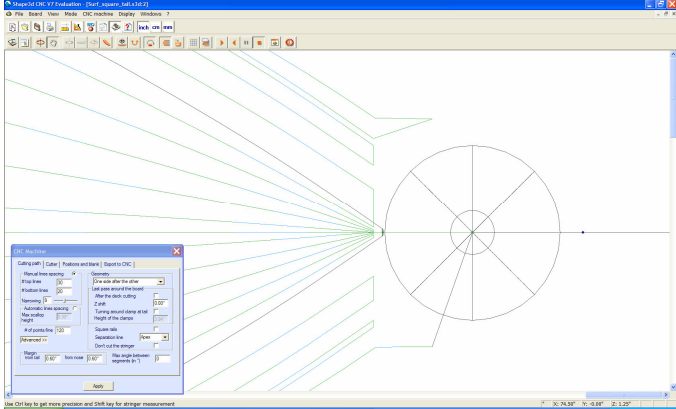
Click on the cutting lines icon in the toolbar, and check the cutting lines.

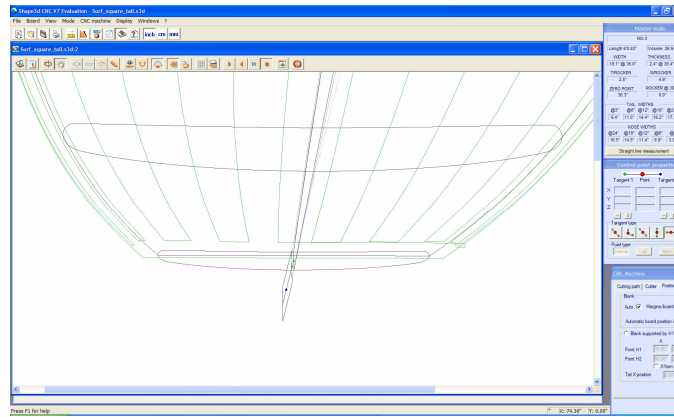


Deck cutting lines (nose and tail):

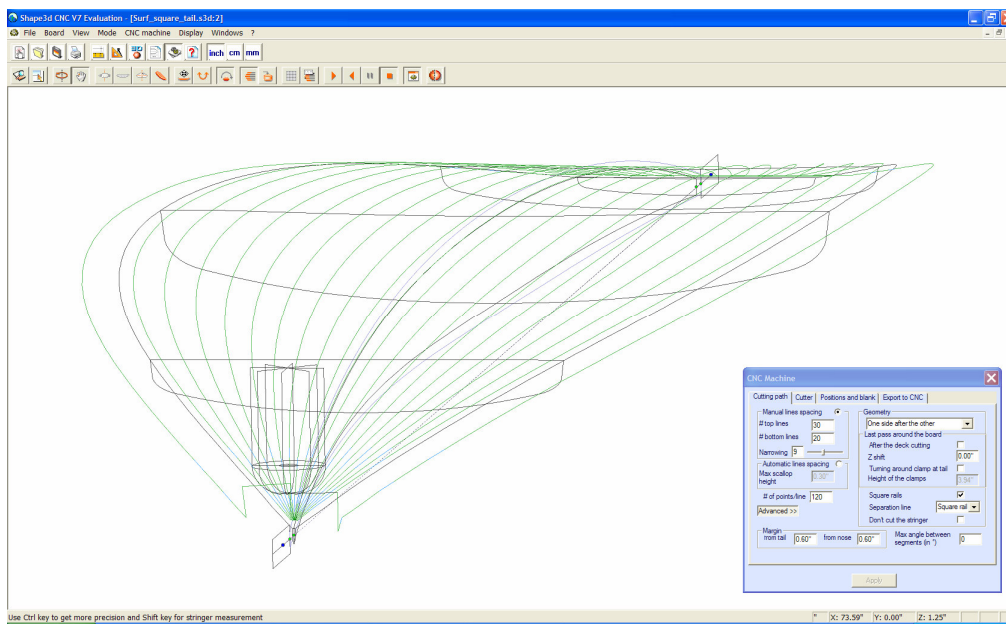


Bottom cutting path (nose and tail):

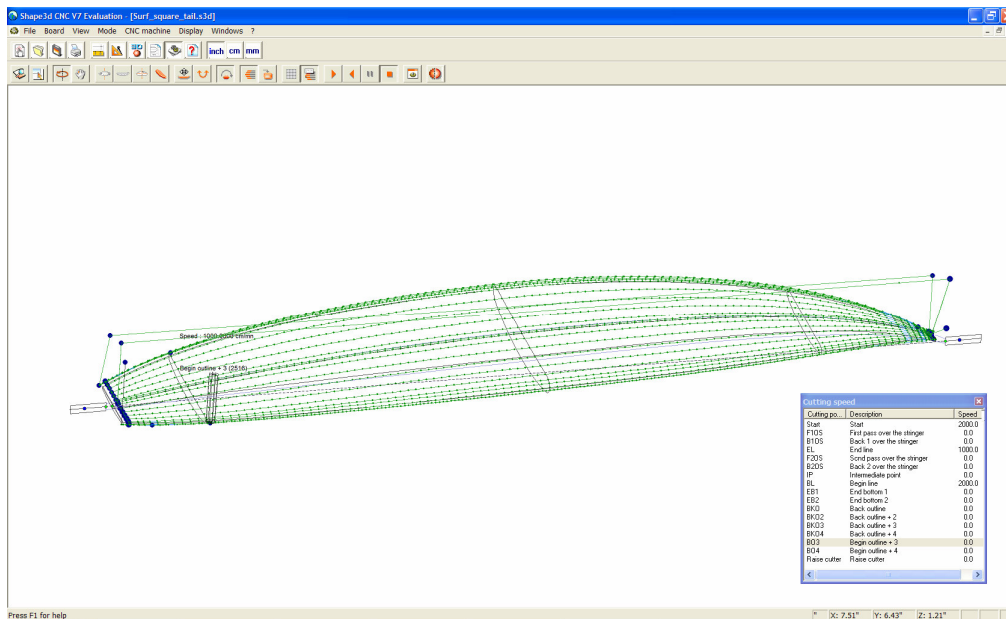




Cutting path with the “Square rails” option:



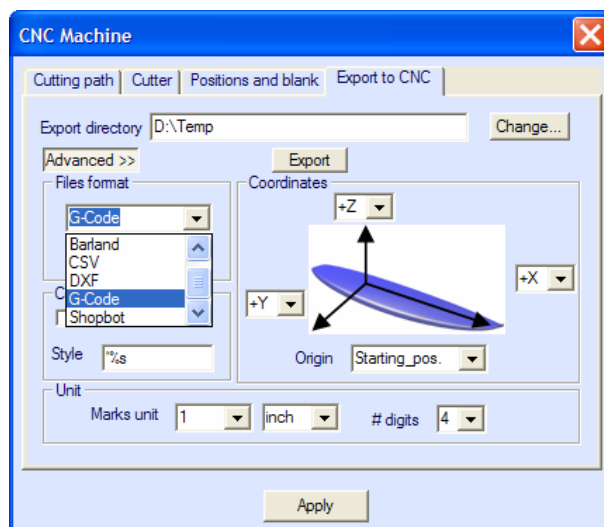
Click on the cutting lines velocity icon in the toolbar, and set the cutting velocities.



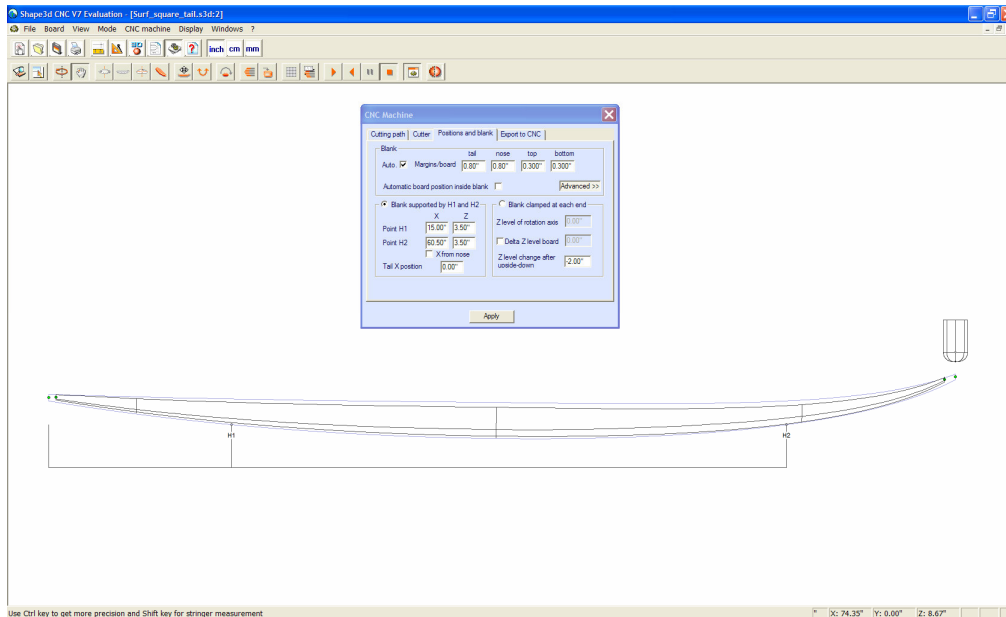
In the “Export to CNC” tab,

- Choose the export directory.
- Choose the files format.
- set the directions of the axis, and the units.

Save, and export.

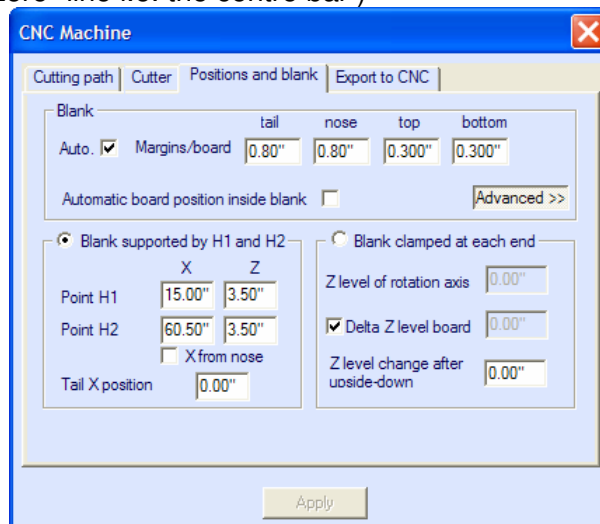


Supported mode:



In the “Position and blank” tab,

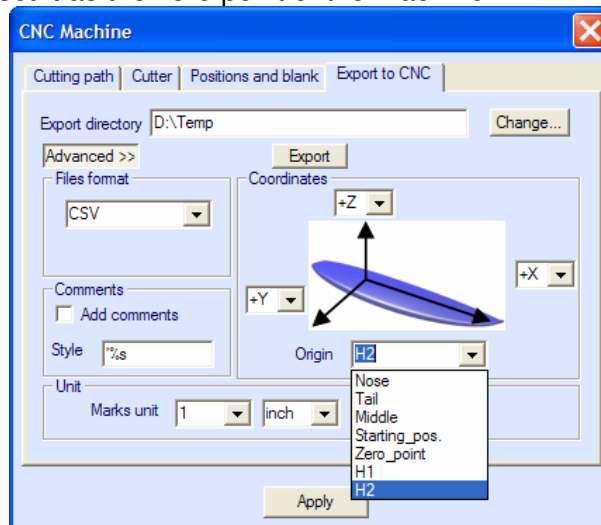
- Choose the blank (automatic or not), and position the board inside the blank using the mouse or checking the “Automatic board inside blank” box.
- If you use the automatic board positioning inside the blank, you can tune the height of the board ticking the “Delta Z level board” box.
- If you have to change the level of the supports after flipping the board, set the “Z level change after upside-down”.
- Set the position of the supports H1 and H2 as you measured it on your machine. (a height from a “zero” line i.e. the centre bar)



In the “Export to CNC” tab,

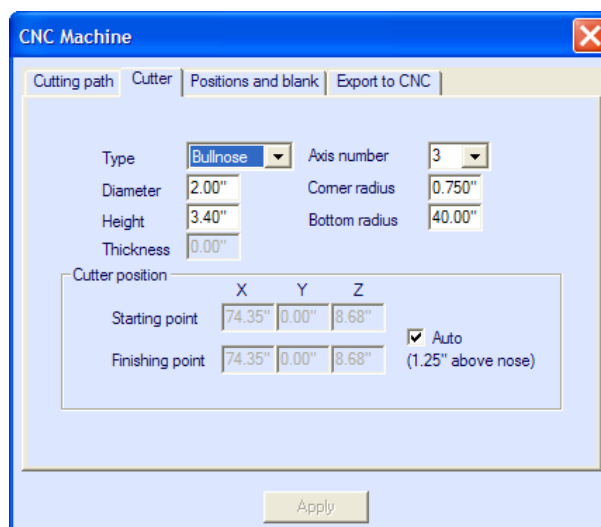
- Set the origin of the machine at a position that you can precisely locate: H1 or H2 are good choices. Nose or tail of the blank is not a very good choice, for you will not be able to locate them precisely, and for they move when you flip the board.
- If you use starting point I, as some machines have a set “home” . make sure that you have a way of knowing your z height is at the origin , as you may have had to drop this axis to cut into the deck, if you don’t come back to the original origin you will get variations in thickness.

This position is where you must place the center of the bullnose cutter, at the beginning of the process, and then set it as the zero point of the machine.



In the “Cutter” tab,

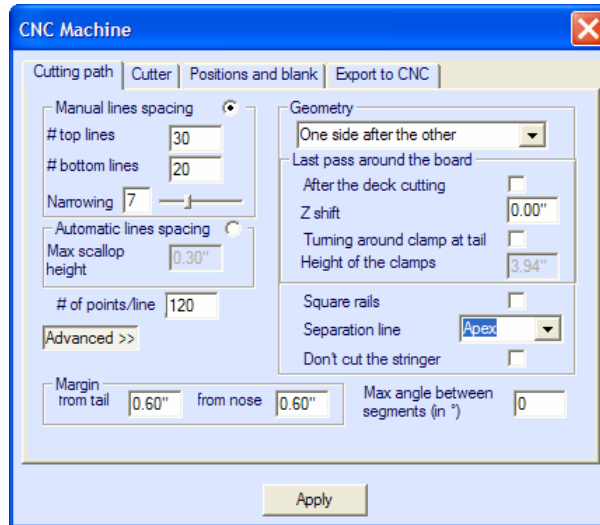
- Define the parameters of the cutter, and the number of axis of the machine (3).
- Set the starting position of the cutter anywhere which is convenient. Auto, for example, will set it 1.25” above the nose of the blank. It is not necessary to locate this point precisely, since the machine will go to this position at the beginning of the cutting process by itself.(if you have set this as your zero point of the machine)



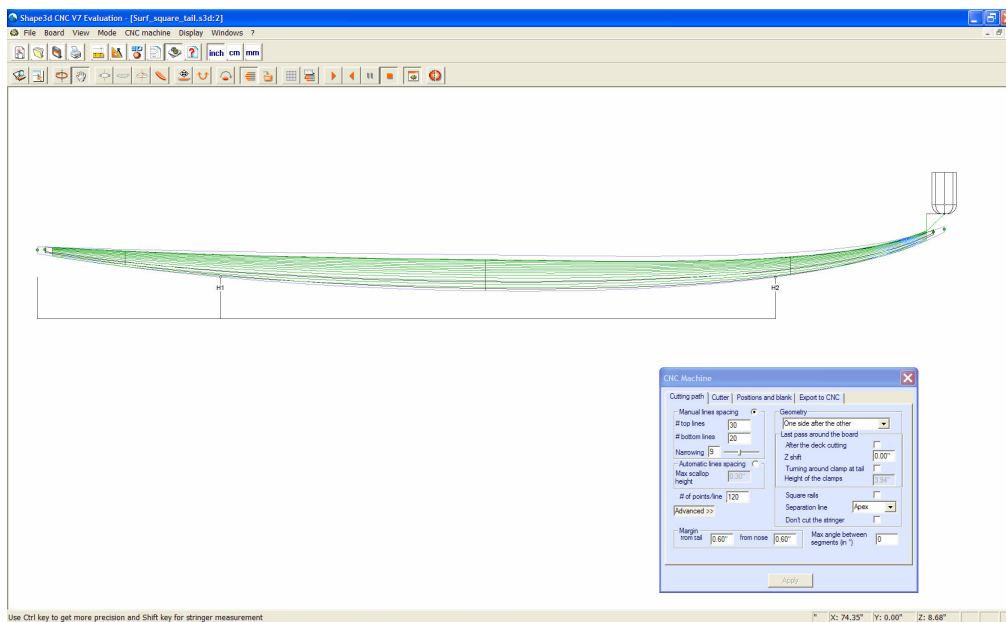
In the “Cutting path” tab,

- Choose the number of cutting lines and their geometry. Note that you can automatically set the lines spacing that fixes the maximum scallop height to a chosen value. Also set the number of points per line, the larger the smoother.
- Check the “Last pass around the board after the deck cutting” box if you don’t want the last pass to be done after the bottom cutting.
- Set the Z shift of the last pass around the board.
- Check the “Turning around clamp at tail” box if needed. Then give the thickness of the clamps.
- Set the separation line as the apex if you want the machine to cut the rails. If you want the rails to remain square, check the “Square rails” box. Note that in this latter case you must have defined the rail of the slices in the design mode.

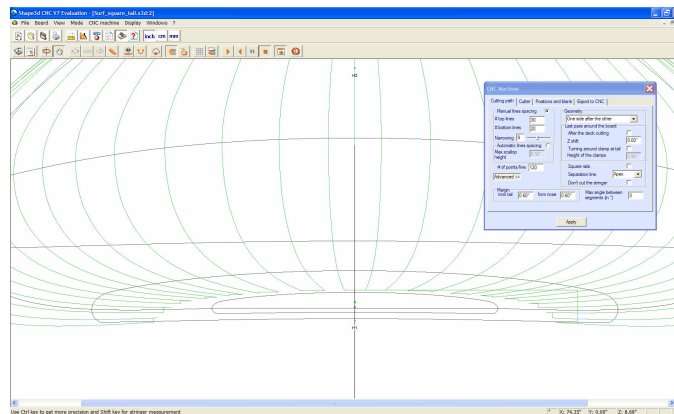
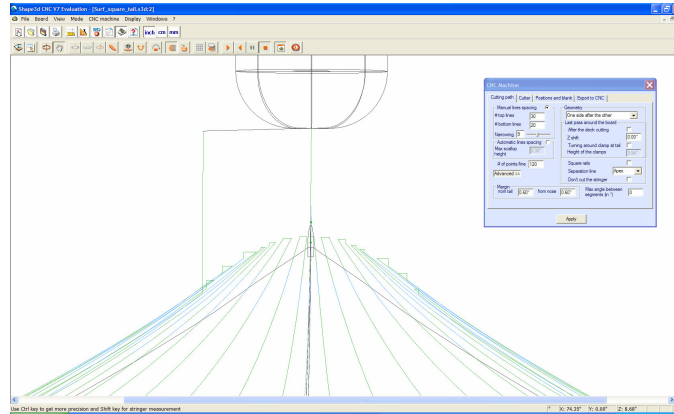
- Check the “Don't cut the stringer” box if needed.
- Choose a margin at the nose and tail.



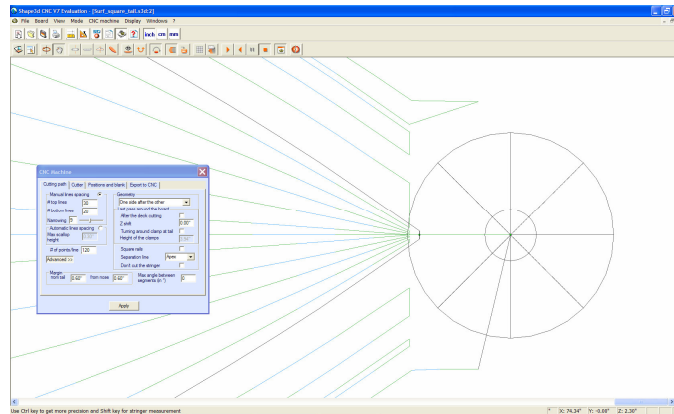
Click on the cutting lines icon in the top toolbar, and check the cutting lines.

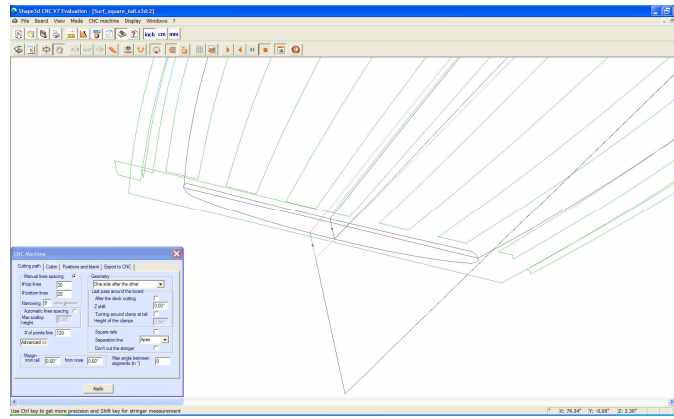


Deck cutting lines (nose and tail):

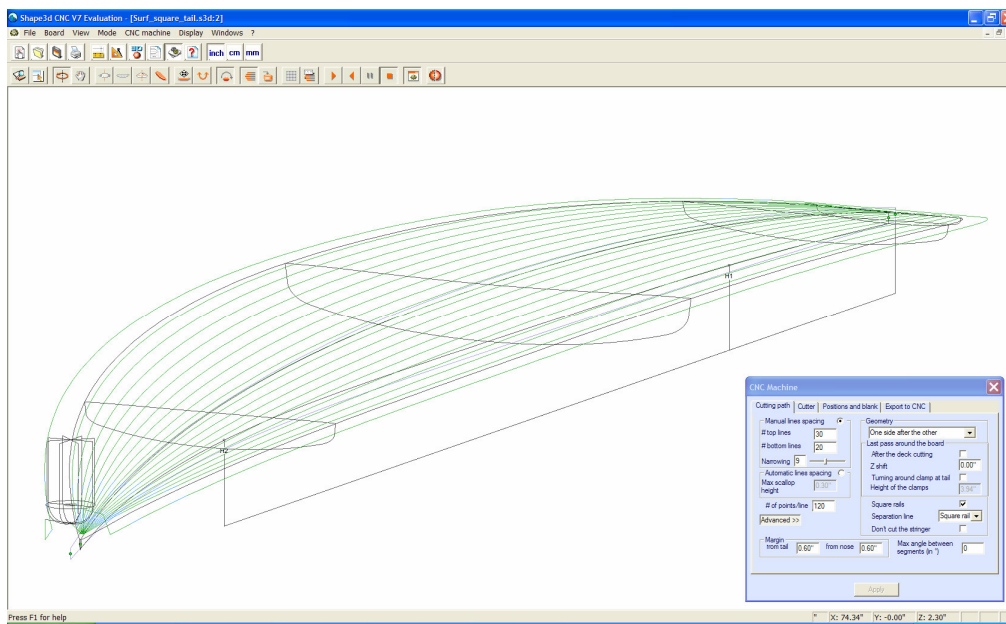


Bottom cutting lines (nose and tail):

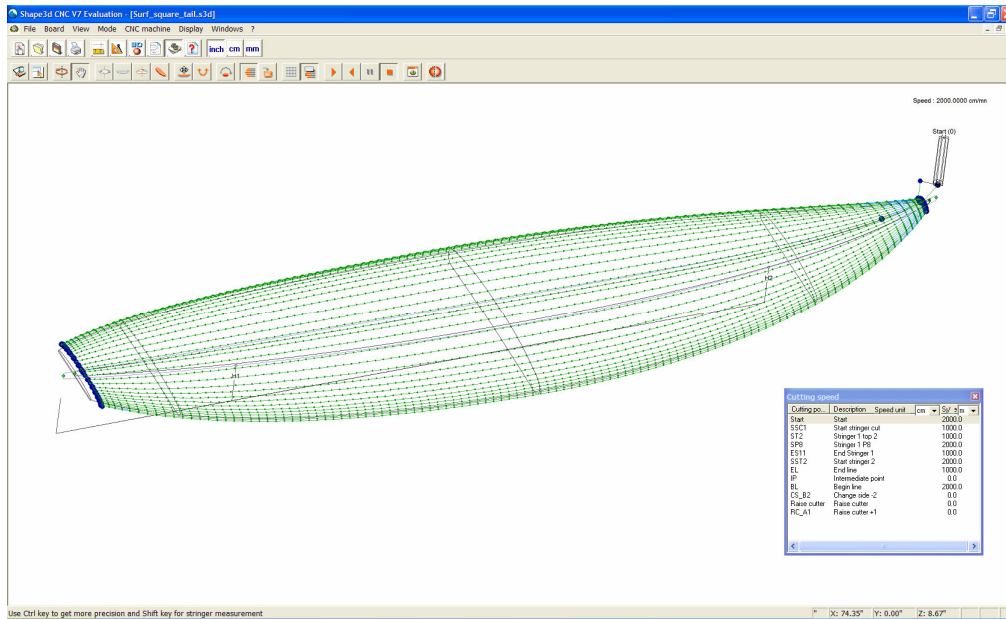




Cutting path with the “Square rails” option:



Click on the cutting lines velocity icon in the toolbar, and set the cutting velocities.



In the "Export to CNC" tab,

- Choose the export directory.
- Choose the files format.
- set the directions of the axis, and the units.

Save, and export.

