ROLAND MDX-650 MILLING TUTORIAL

Assembled by UCO Engineering Physics Majors - Justin Hawkins, Dan Reser, and Michael Potts

Table of Contents

1.1 Opening .igs File With Modela Player 4

Start Modela Player 4 and open the saved SolidWorks *.igs* file. Save the new Modela 4 *.mpj* file (see Fig. 1-1).
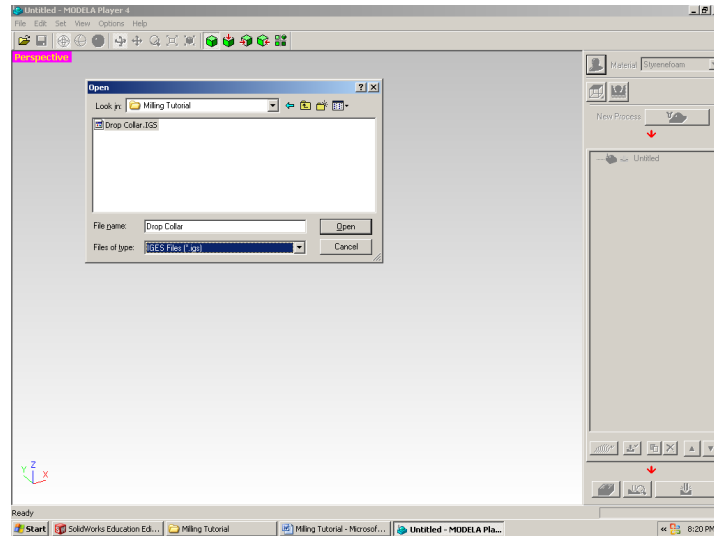

Fig. 1- 1

1.2 Setting Origin

Reorient the part if necessary and set the origin under the Model section.

1.3 Setting Orientation

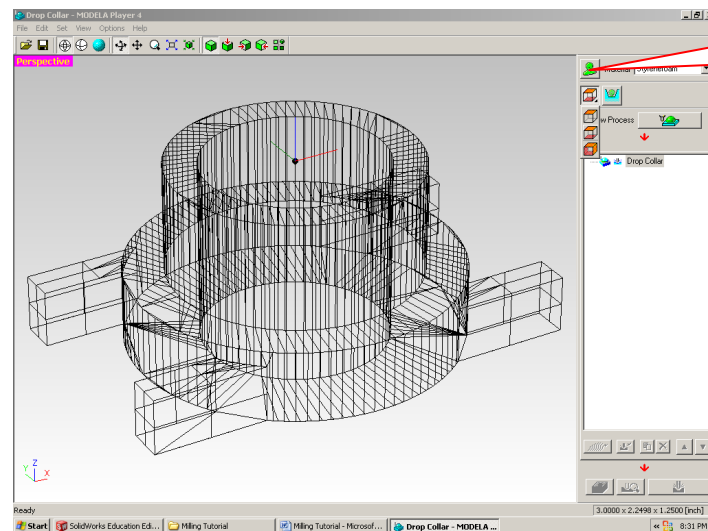Proceed to Model tab as shown (see Fig. 1-2, 1-3, & 1-4).

Click to go to *Model* tab

Fig. 1- 2

Fig. 1- 3

Select top surface

Fig. 1- 4

Select origin
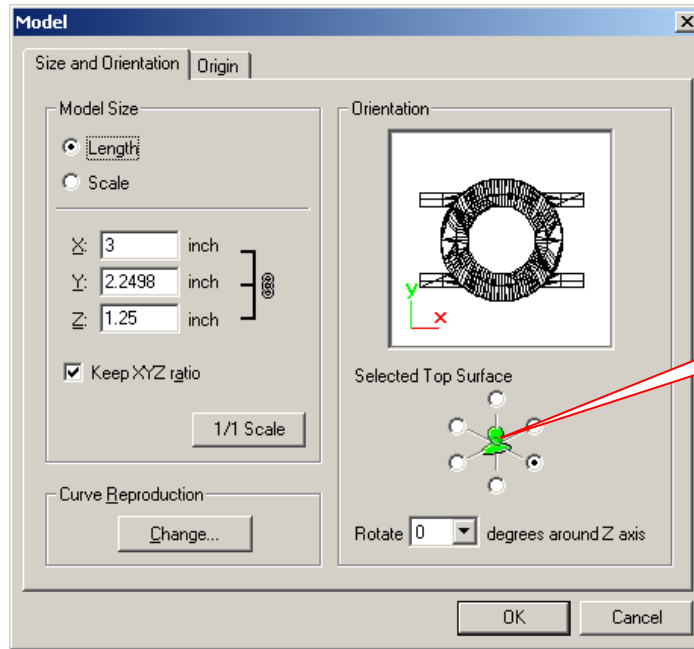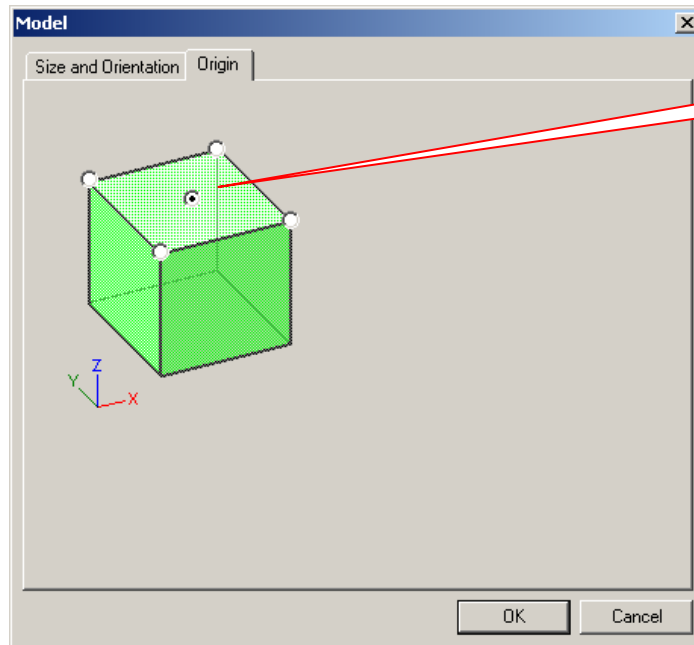
1.4 Number of Cutting Surfaces

Set the number of cutting surfaces. With this orientation two cutting faces will cut the entire part (see Fig. 1-5).

4

Click to set cutting faces
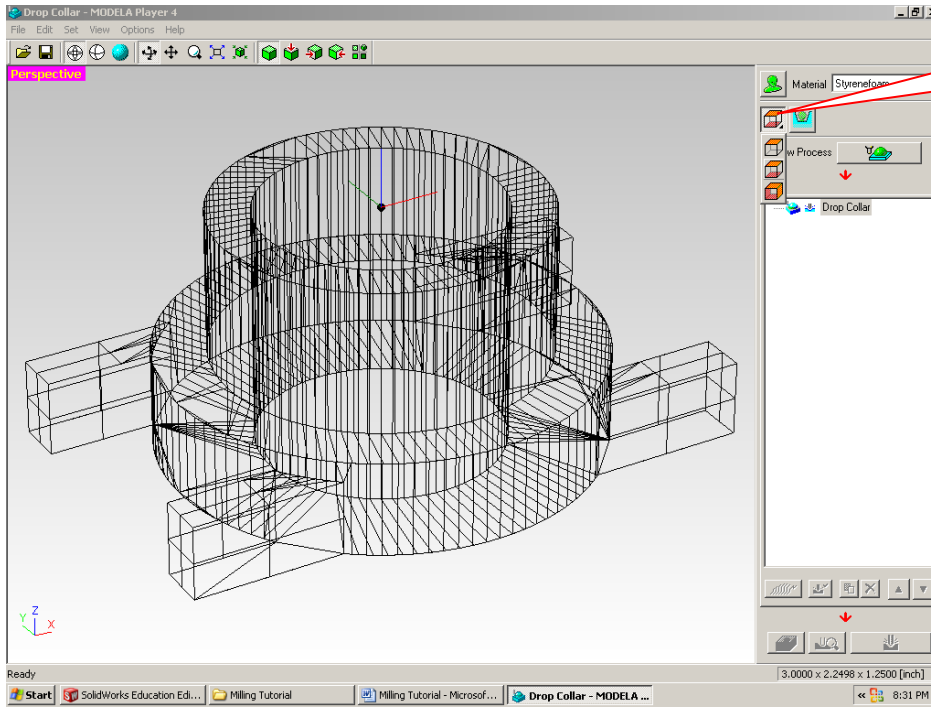
Fig. 1- 5

1.5 Format Model

Format the Modeling Form as shown (Fig. 1-6, 1-7, & 1-8).

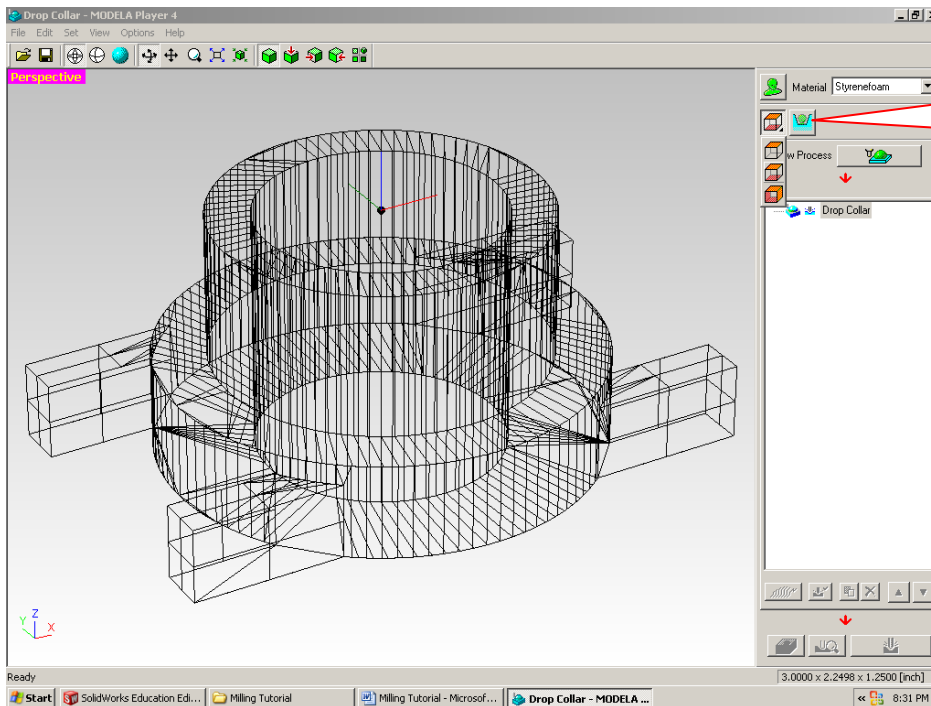Click to go *Modeling Form*

Fig. 1- 6

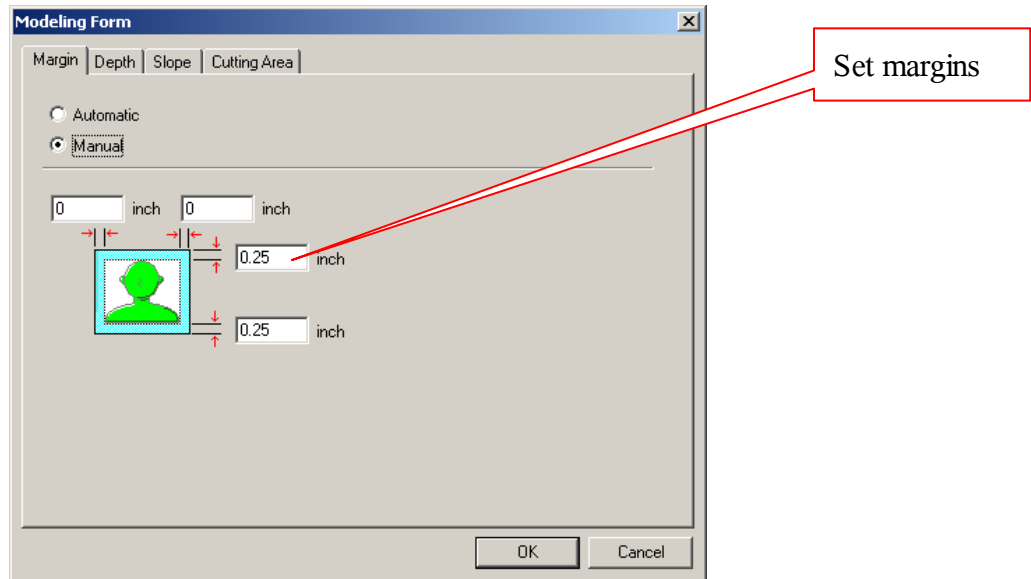Change the margin to 0.25in as shown below (Fig. 1-7)

Fig. 1- 7

Set overlap as shown below (Fig. 1-8)
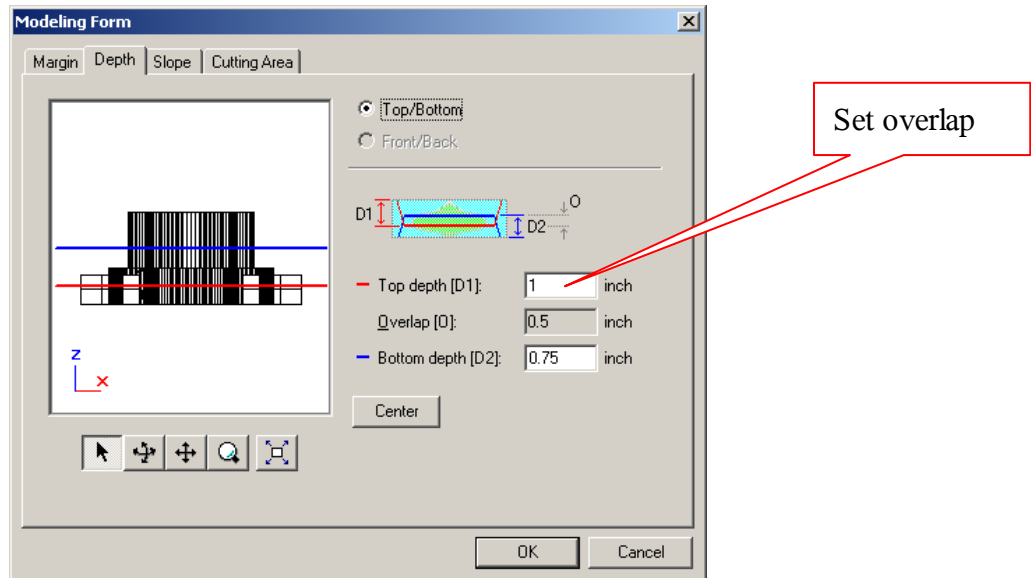
Fig. 1- 8

1.6 Selecting the Material

It's important to select proper material. Use the drop down box to select the type (Figure 1-9).
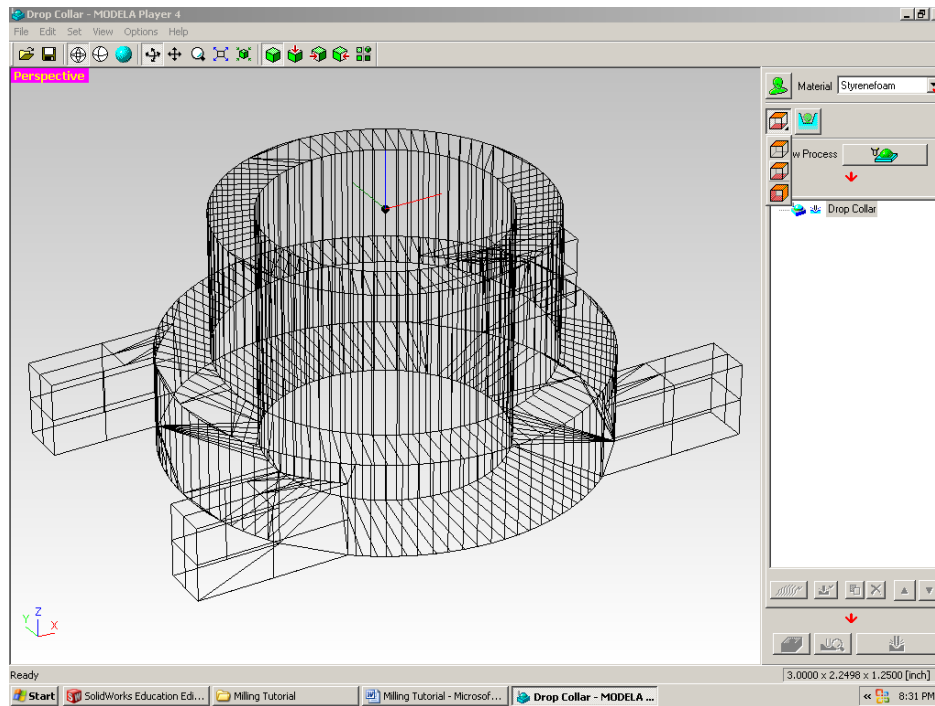
Fig. 1- 9

1.7 Creating a New Process

Refer to figure 1-10.

Click to go to *New Process Creation*

Fig. 1- 10

Select *Roughing*

New Process Creation

Choose the type of process.

- ☐ Surfacing
- ☑ Roughing
- ☐ Finishing
- ☐ Drilling

< Back   Next >   Cancel

Fig. 1- 11

Select *Top* cutting surface

Fig. 1- 12

Select the tool to be used. For rough cut use S.25 Flat

Select tool and click *Next*

Fig. 1- 13

New Process Creation

Set the cutting area and depth.

☉ All   ○ Partial

Cutting Area

Lower left   Upper right

X: -1.5   inch   X: 1.5   inch

Y: -1.1249   inch   Y: 1.1249   inch

Depth

— Start Height: 0   inch

— End Height: -0.65   inch

☑ Cut from top surface of workpiece

☐ Extend Depth Limit

< Back   Next >   Cancel

Leave default settings and Click *Next.*

Fig. 1- 14

New Process Creation

Choose the type of tool path to create.

☉ Scan Lines   X

○ Unidirectional   X

○ Contour Lines   Up Cut

☐ Optimized Pitch

☐ Outline Only

○ Spiral   Up Cut

Cutting Start Position

Lower left

< Back   Next >   Cancel

Leave default settings and Click *Next.*

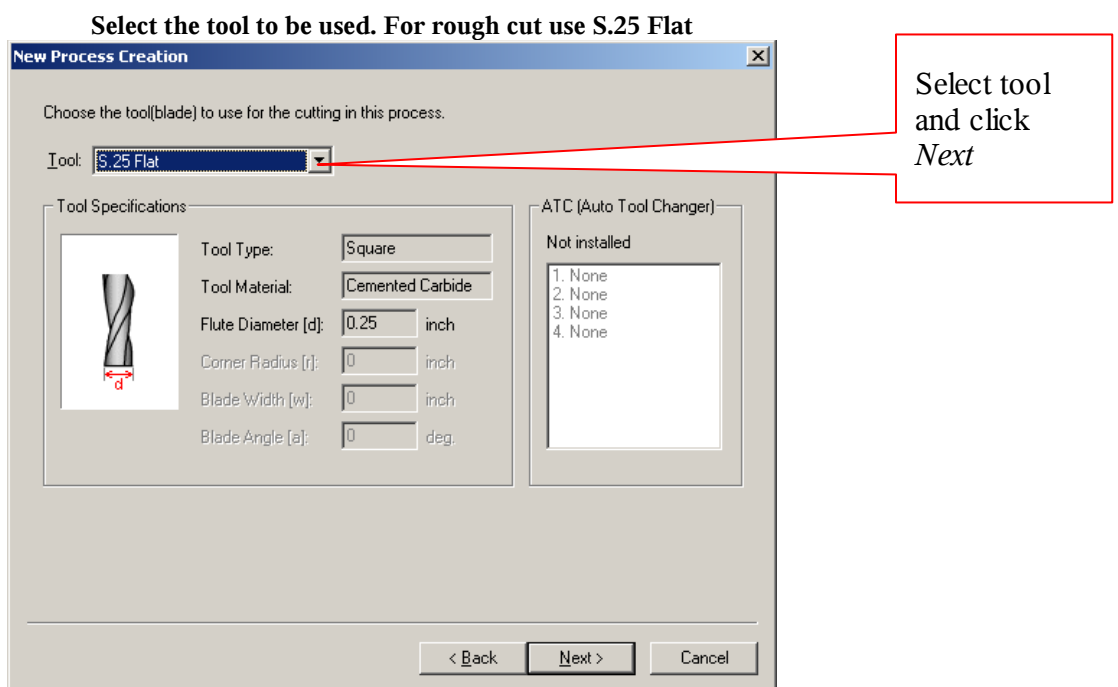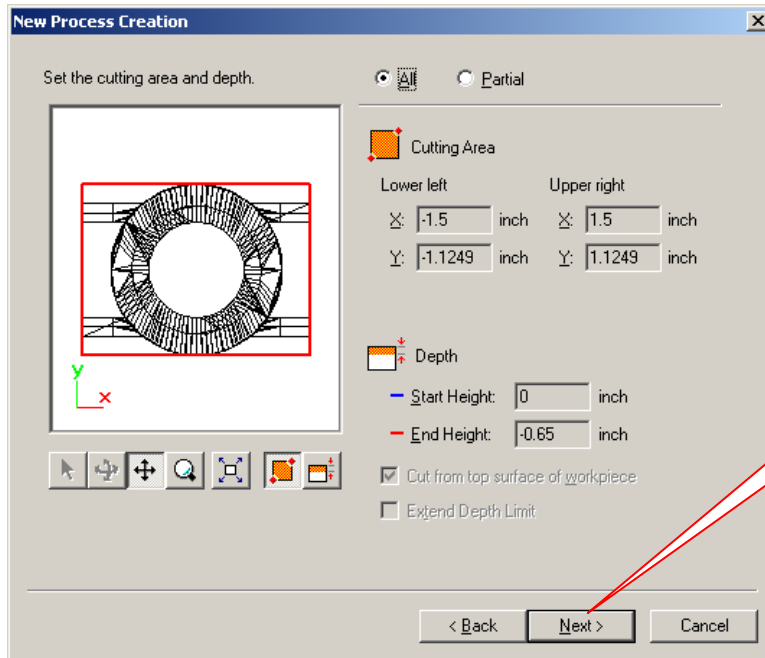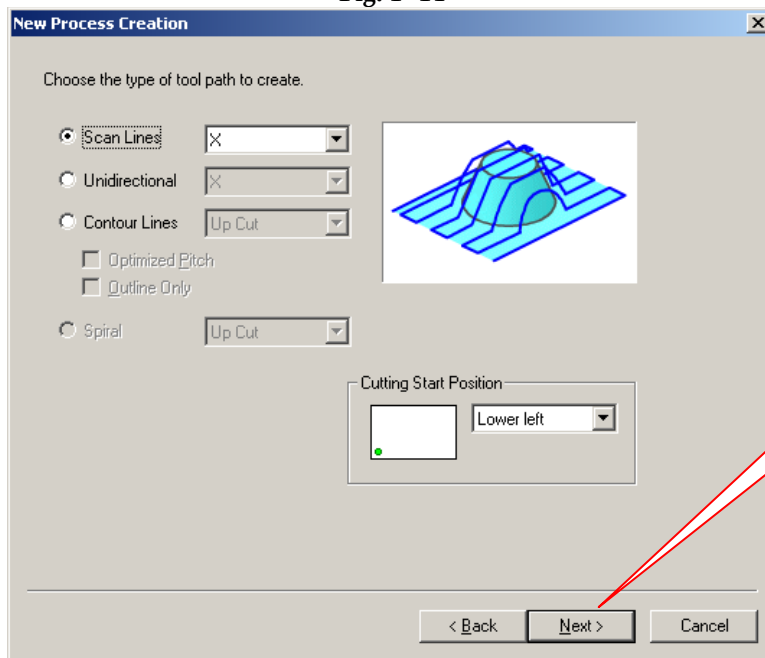**Fig. 1- 15**

10

Do not change the values of the tool.
This could result in damage to the tool of mill (Fig. 1-16)

Leave default settings and Click *Next.*

Fig. 1- 16
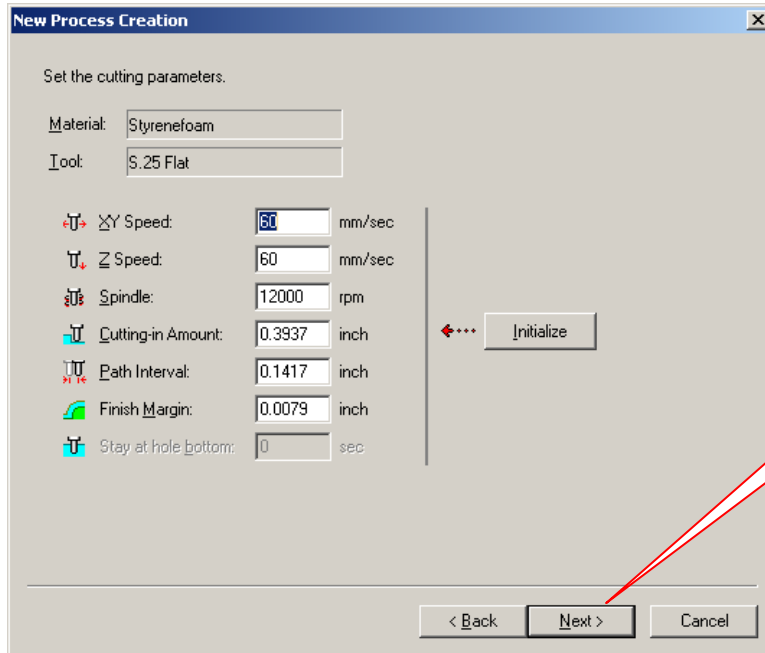

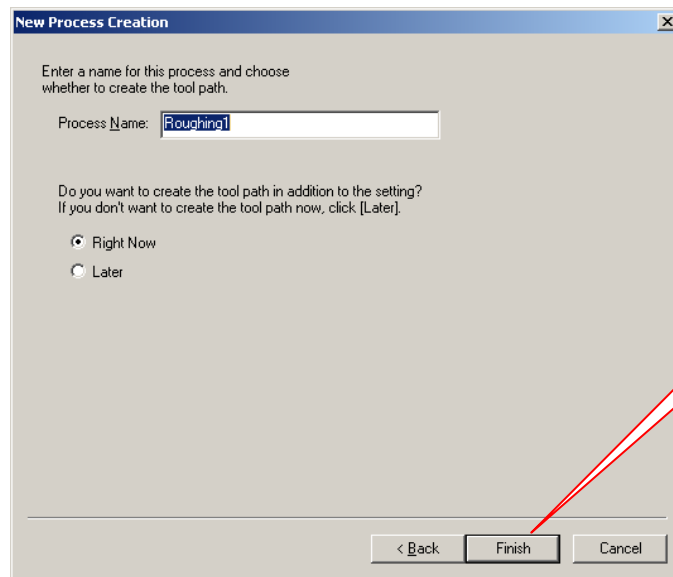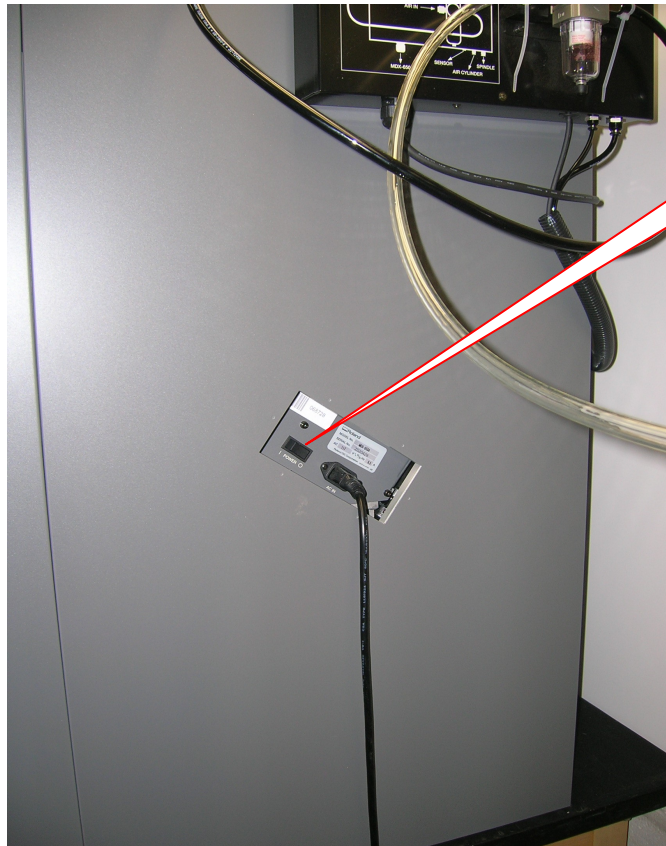Leave default settings and Click *Finish.*

Fig. 1- 17

11

1.8 Working with the Roland Milling Machine.

If the mill is not turned on, switch the master power switch on as shown. The switch is located on the right side of the mill.

Turn on master power switch

Fig. 1- 18

This is a picture of the user interface of the Roland Mill. All operations are done from this interface.

Note: The large red button is the emergency halt button. Remember it is always better to hit this button then to break some part of the machine!

Navigation dial

Emergency halt button

Enter button

Fig. 1- 19

Press *Enter* on the first screen to select RML-1 (Roland Machine Language)

Fig. 1- 20

Rotate the round navigation dial to scroll through the mill options. If the screen is displaying the coordinates of the tool press *Exit* once to view the option menu. This is always the procedure if one wishes to enter the option menu.

Once in the O*ptions* menu, scroll down to option 13 ATC (Automatic Tool Changer), as shown below, and press *Enter*.

Fig. 1- 21

Press Enter once again for 13-1 Tool Select

Fig. 1- 22

Press *Enter* once again for option 13-1-1 Tool_1. A different tool may be selected if desired. Choose the tool that will be easiest to align the center point.

Fig. 1- 23

After selecting the tool the Mill will retrieve the tool then move to the position shown below.
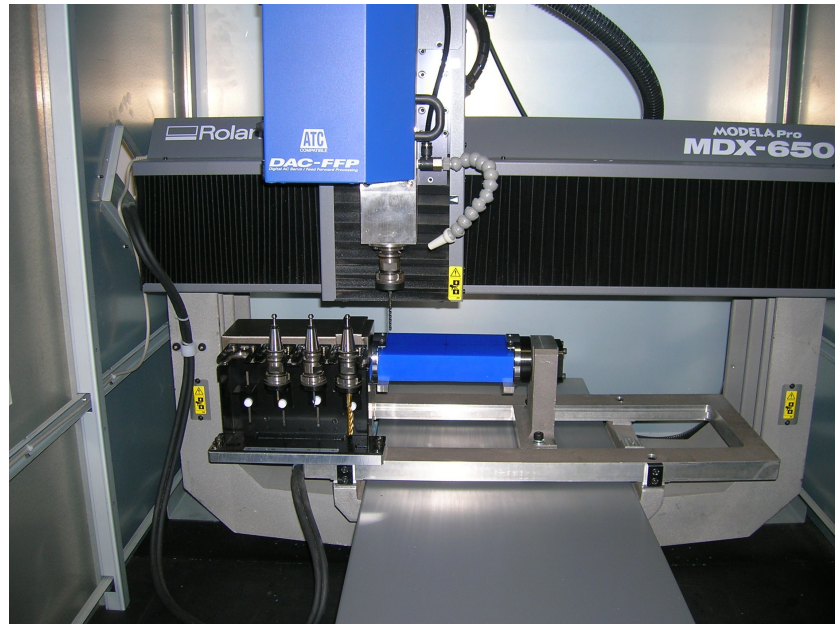

Fig. 1- 24

The Roland Mill may not be set at zero on the fourth axis (Rotary Axis). Return back to the *Options* menu and select Option *12 Rotary Control*.

Press *Enter*

Fig. 1- 25

Press *Enter* to select *Rotate*. Turn the knob to zero degrees then press *Enter*.

Fig. 1- 26

Use the controls seen below to move the tool and material to the marked center point. Moving the material and tool is intuitive. Forward, Back, Right, Left, +Z(up),-Z(down)
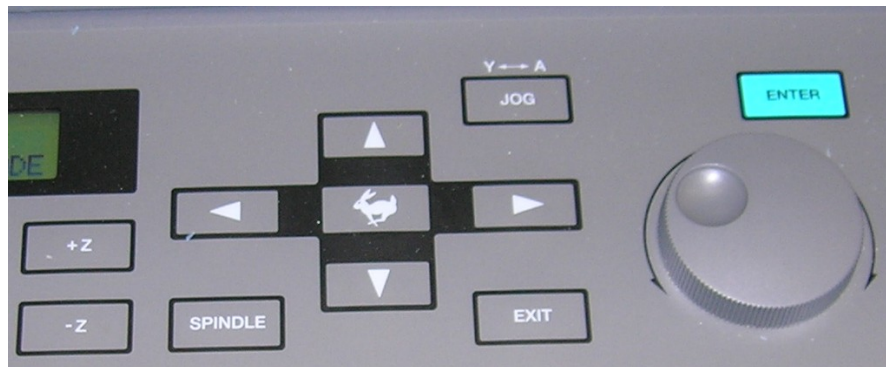

Fig. 1- 27

Once near the center begin lowing the tool down (-Z). Stop well before touching the material (0.5 to 0.25")
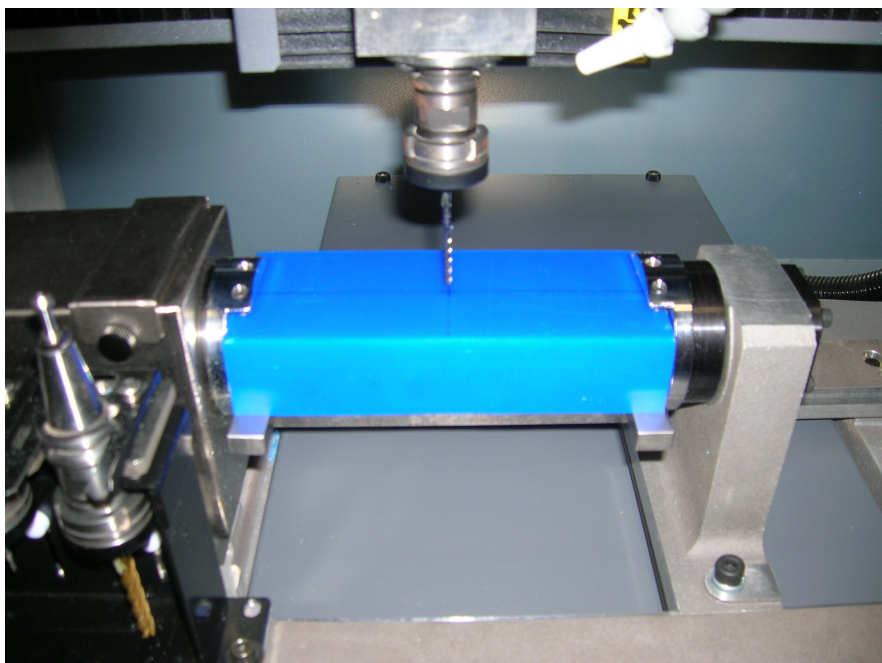

Fig. 1- 28

Place a piece of paper on top of the material. Use the round wheel to lower the tool tip down to the paper (rotate clockwise to lower). Lower the tool until the paper is just barely resisted to motion. Remove the paper then turn the knob just a bit more until it is just above the material.
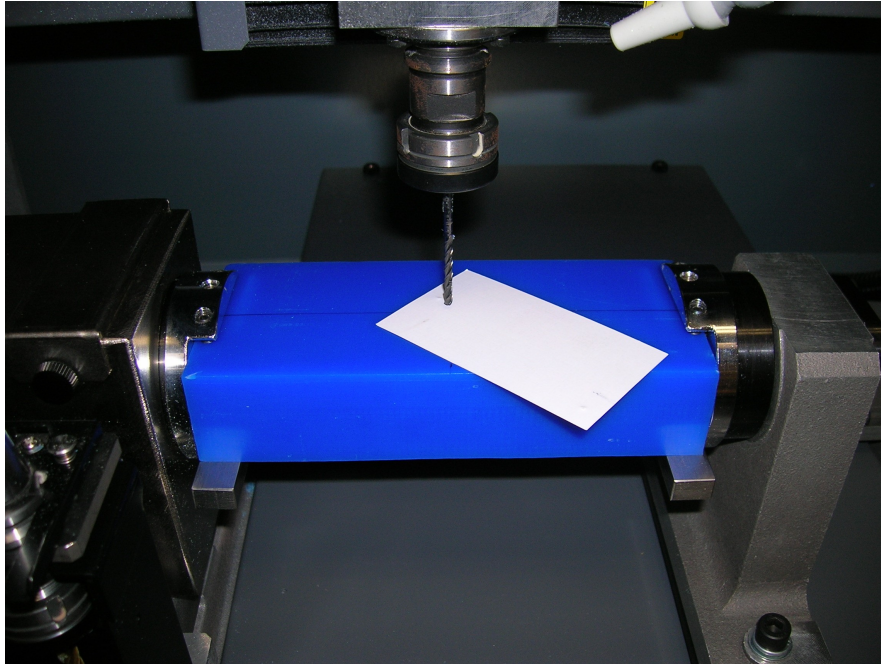

Fig. 1- 29

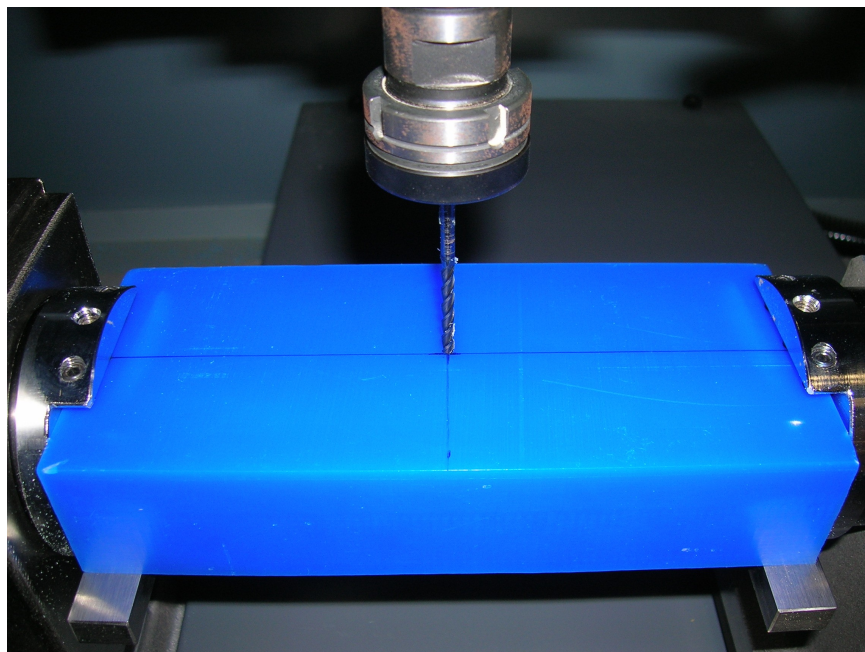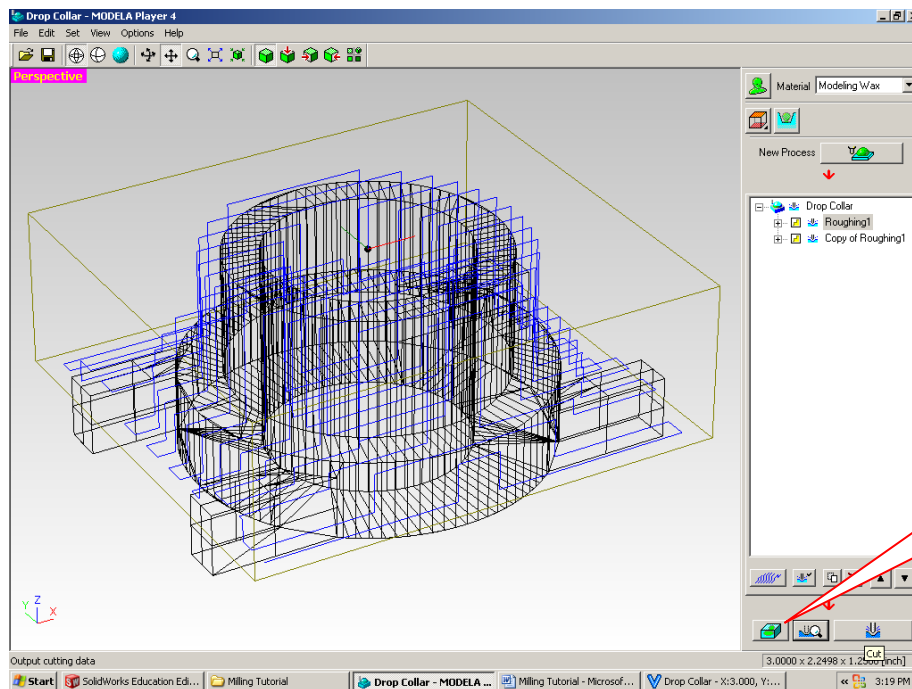At this point make the last adjustment to get the tip centered.

Fig. 1- 30

The screen now displays the coordinates of the tool. Move on to step 2.10. These numbers entered into the computer.

Fig. 1- 31

1.9 Select Cutting Position Setup as shown with the arrow.

Click to go to *Cutting Position Setup*

Fig. 1- 32

This screen is asking for the tool location. Refer back to the mill display and enter in the coordinates shown.
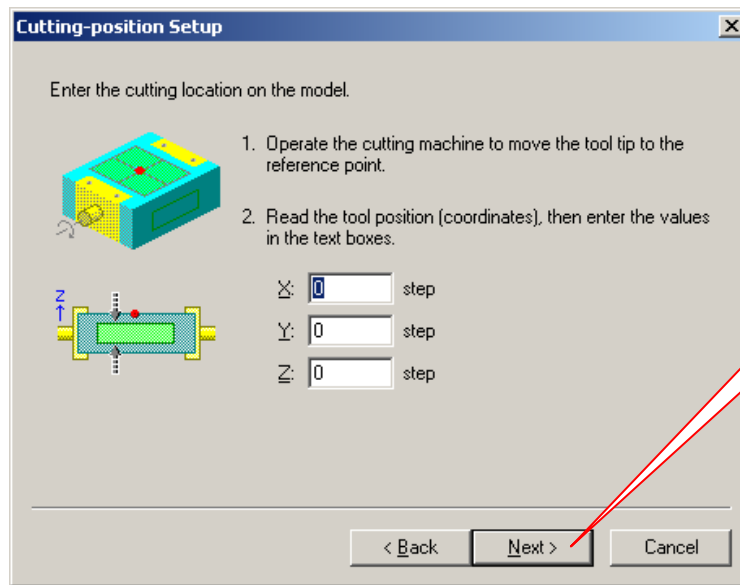

Enter tool coordinates and click *Next*

Fig. 1- 33

Measure the physical size of the material then enter the numbers into the workspace size.

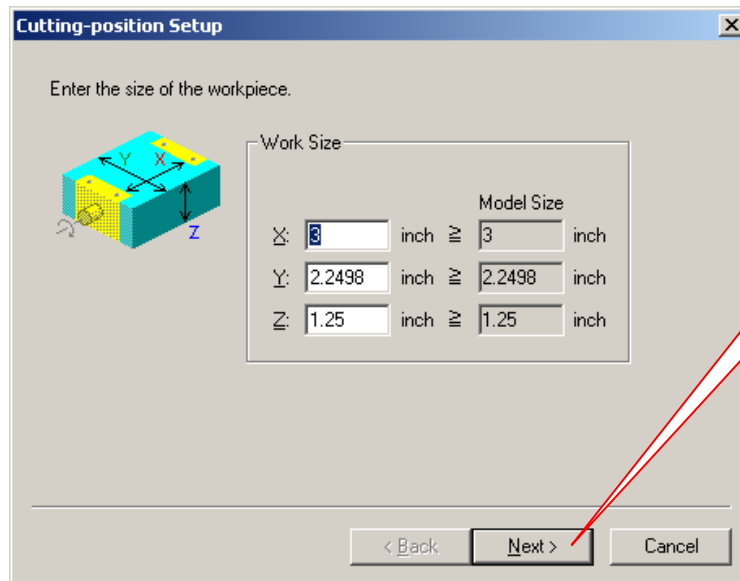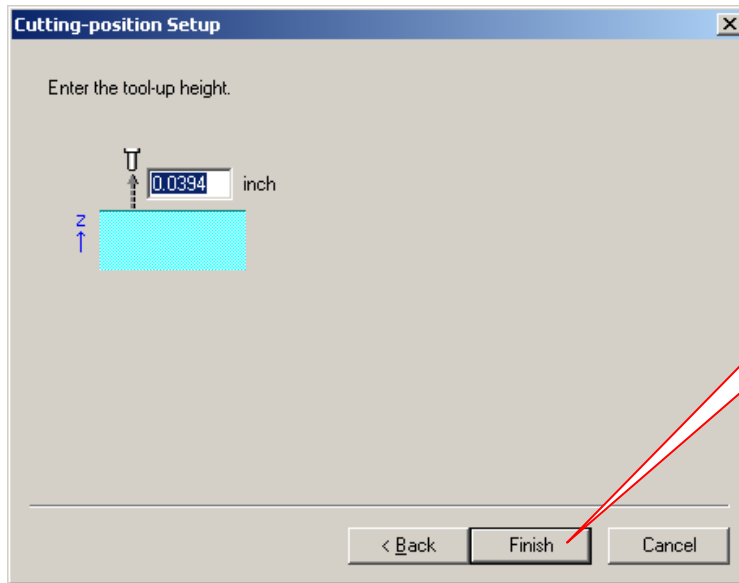Enter material dimensions and click *Next*

Fig. 1- 34
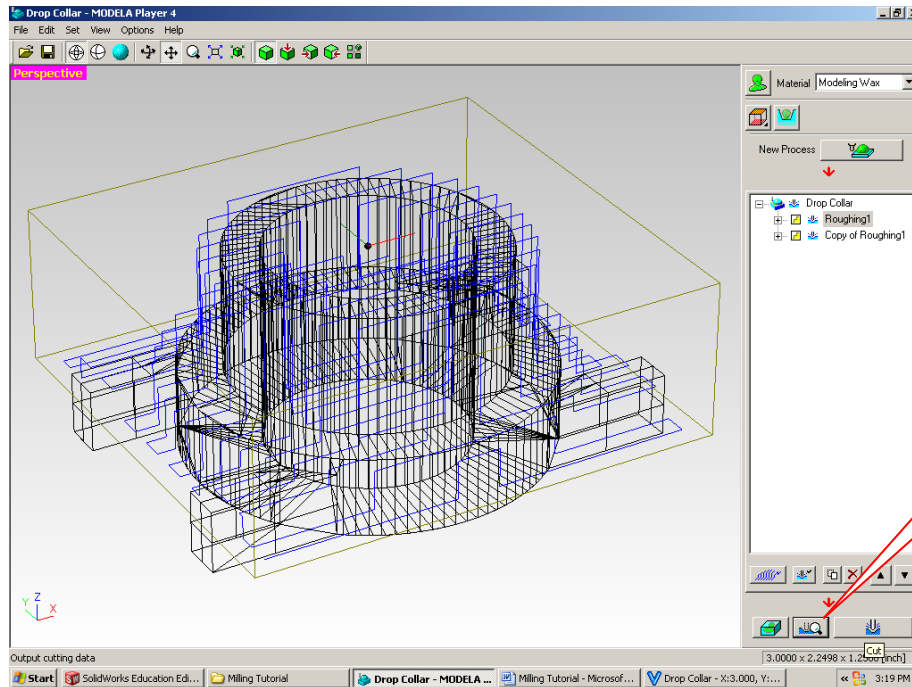
Leave this setting at the default distance.

Leave default
height and
click *Next*

Fig. 1- 35

1.10 Cut Preview:

Select *Cut Preview* to view the simulated part as shown by the arrow. This step
is not mandatory if the cut lines as seen below look correct.
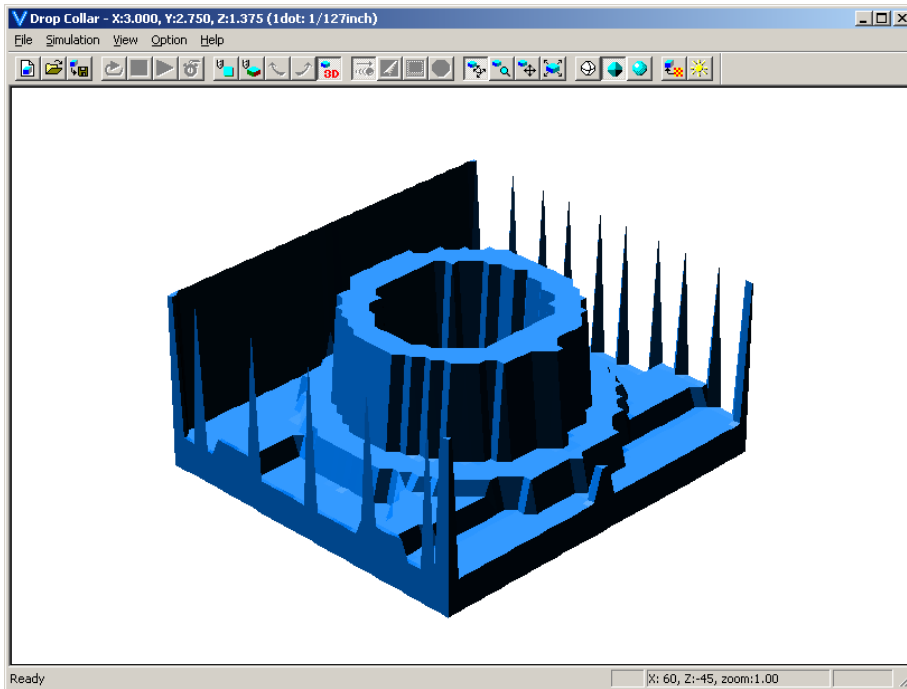

Click *Cut
Preview*
button

Fig. 1- 36

Fig. 1- 37

1.11 Use the Copy Process button as shown below.

This generates a second instance of the first cutting process. Open the copied tree and click on top surface. Change this to *Bottom*. Now both processes have been created. New cutting lines will have to be generated for the bottom. Select *Tool Path* just to the left of the *Copy* button.
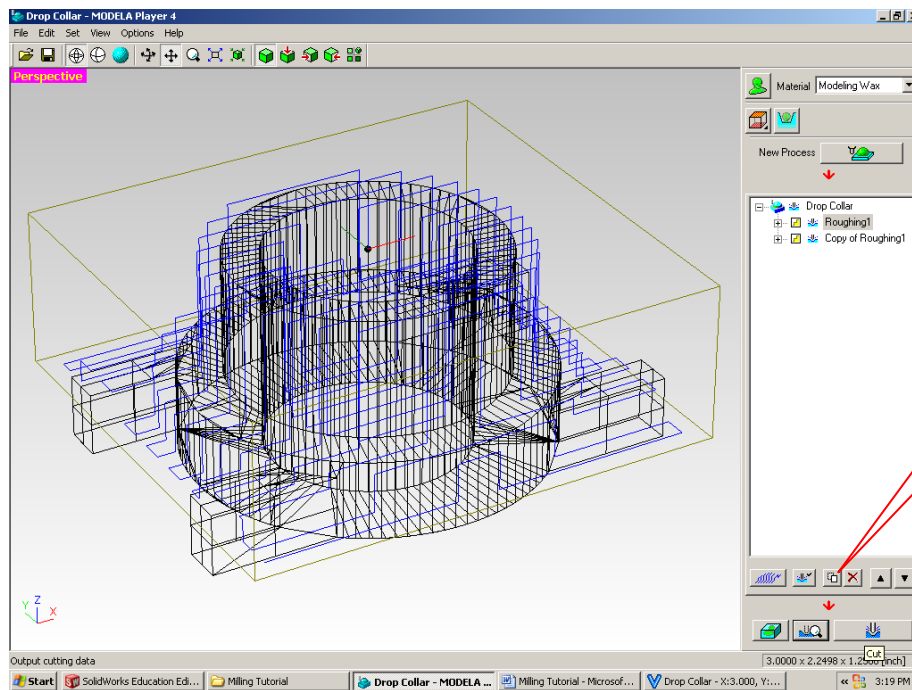

Click *Copy* button, then select *Tool Path*

Fig. 1- 38

1.12 Sending the Cut Command

Use the *Cut* button to send the process to the mill. The cut button is once again shown with a red arrow
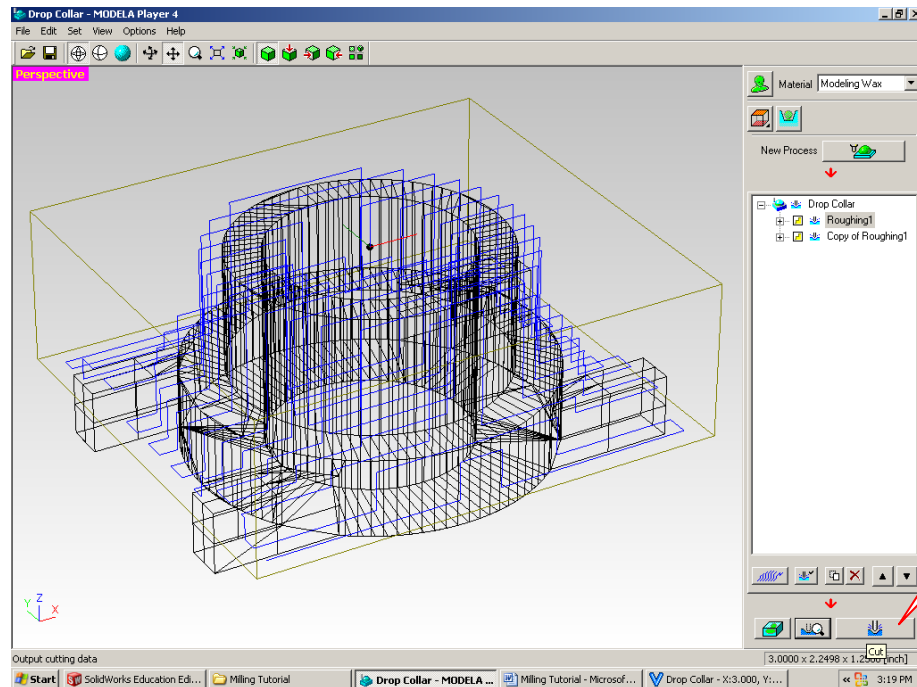

Click *Cut* button to send file to mill

Fig. 1- 39

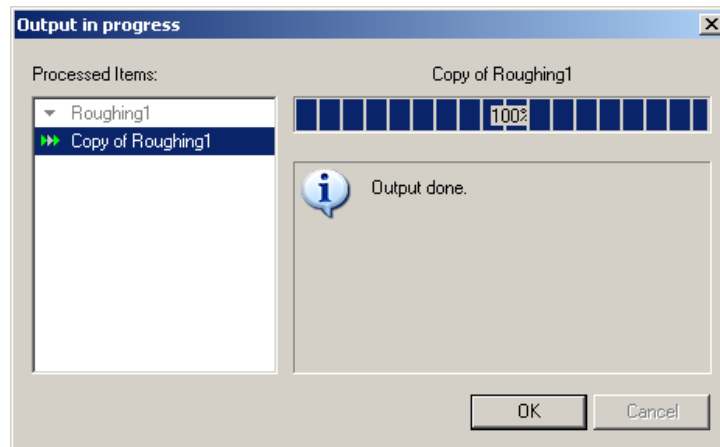Press *OK* three times to send the operations to the mill.

Fig. 1- 40

Please watch the mill at this point and be ready to press the emergency halt button if needed.

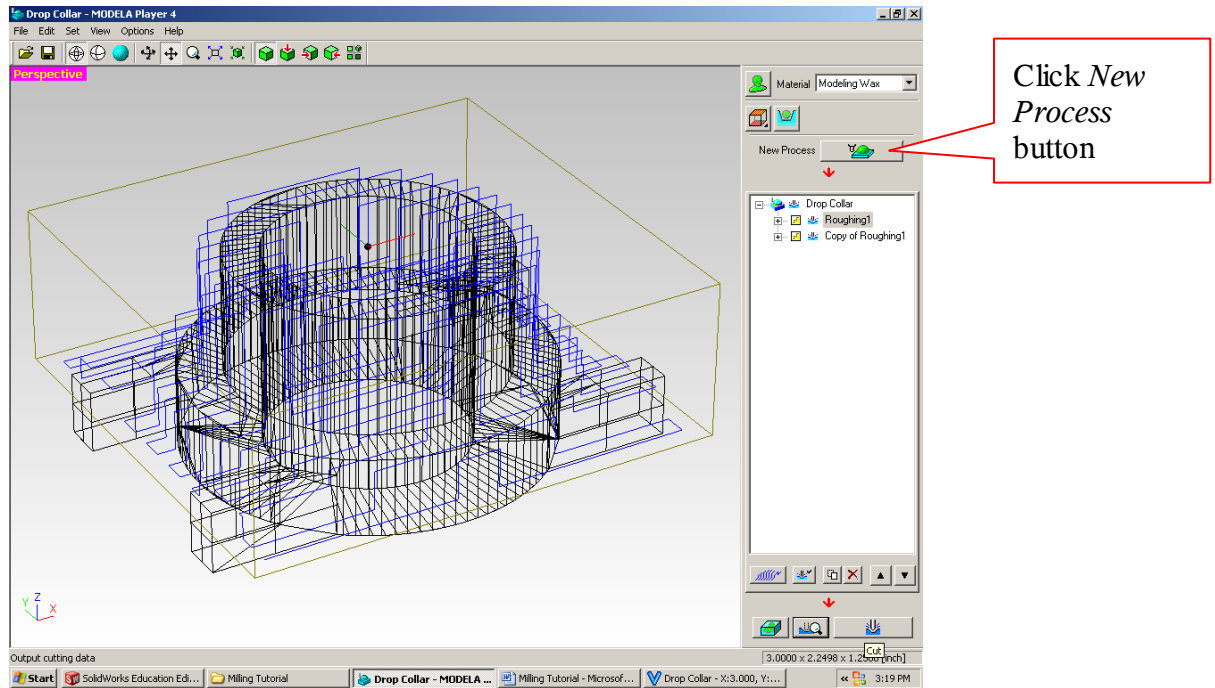## 1.13 Select New Process to creating the finish processes.

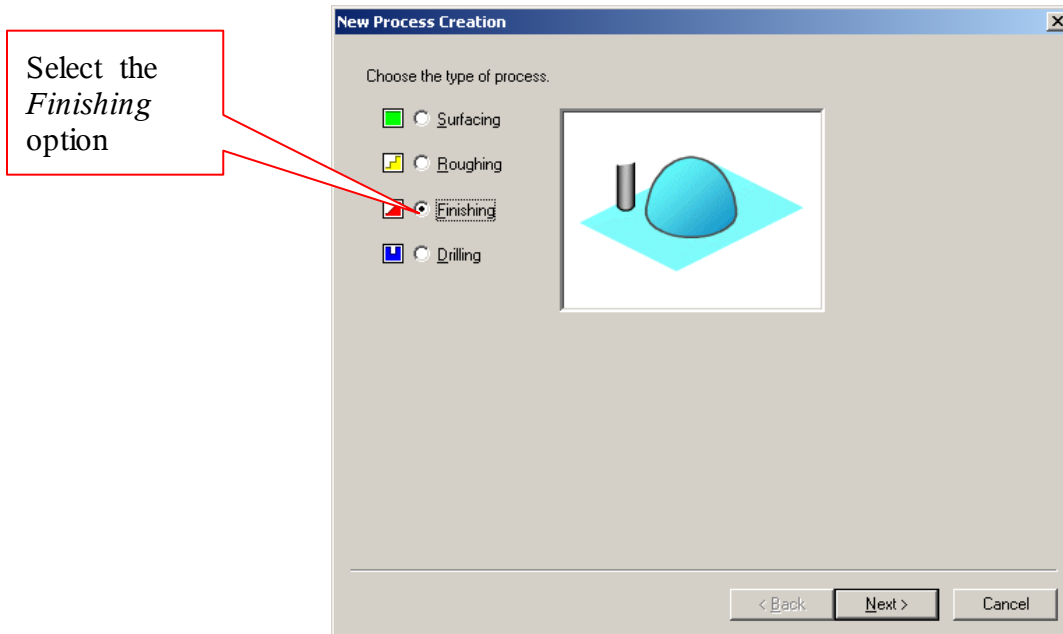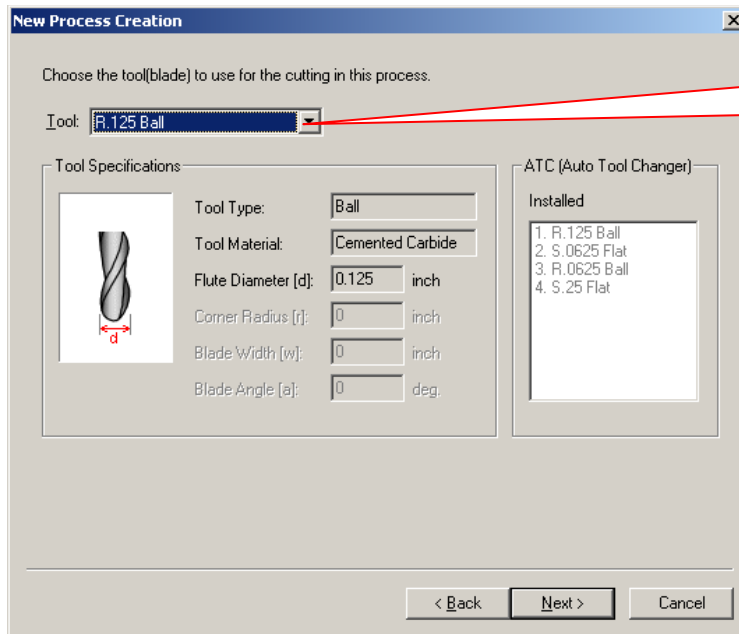Click *New Process* button

Fig. 1- 41
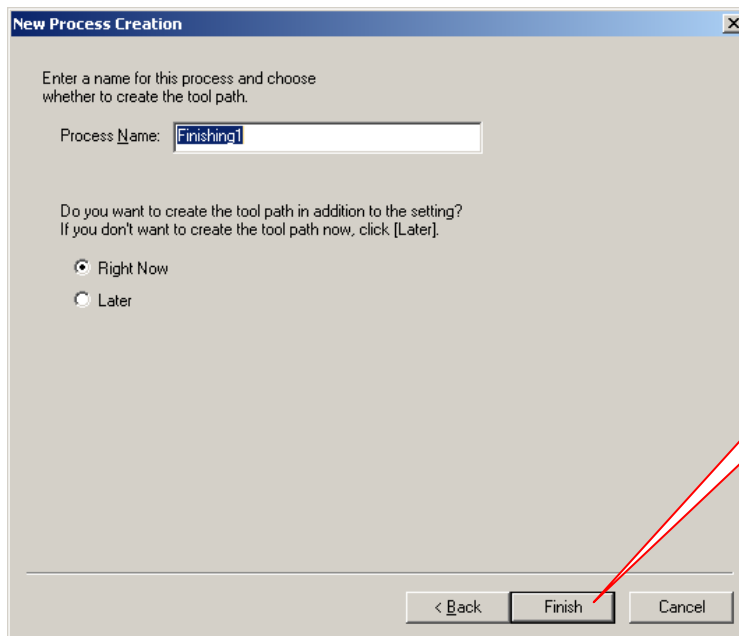

Select the *Finishing* option

Fig. 1- 42

Select *Tool and* click *Next*

Fig. 1- 43

Leave default *Process Name* and click *Finish*

Fig. 1- 44

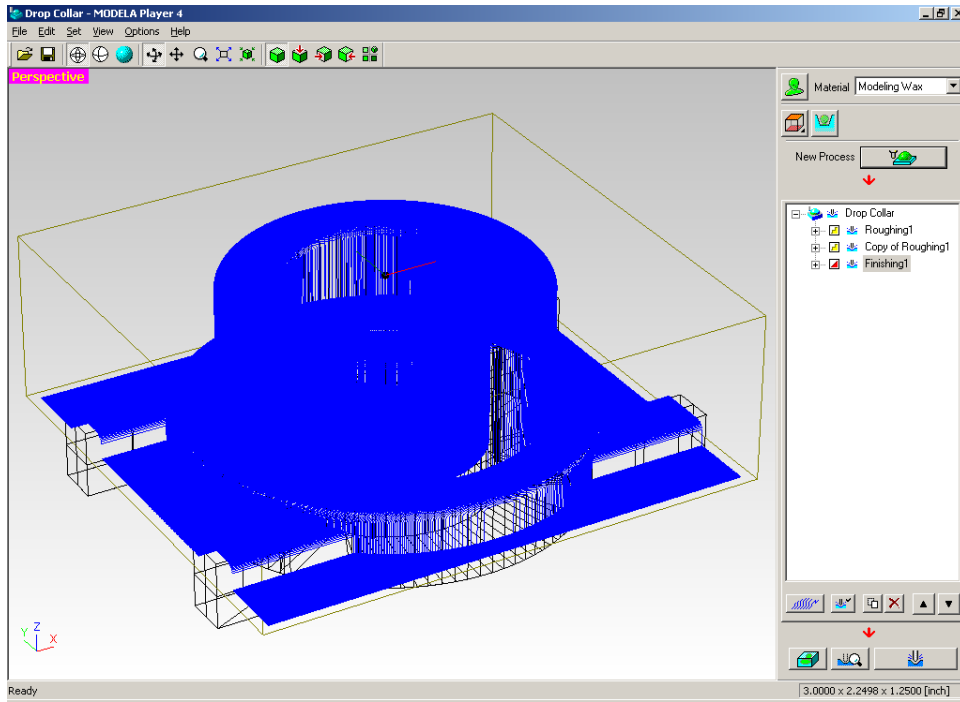A preview of the scan lines is automatically generated (Fig. 1-45).

Fig. 1- 45

1.14 Copy Processes

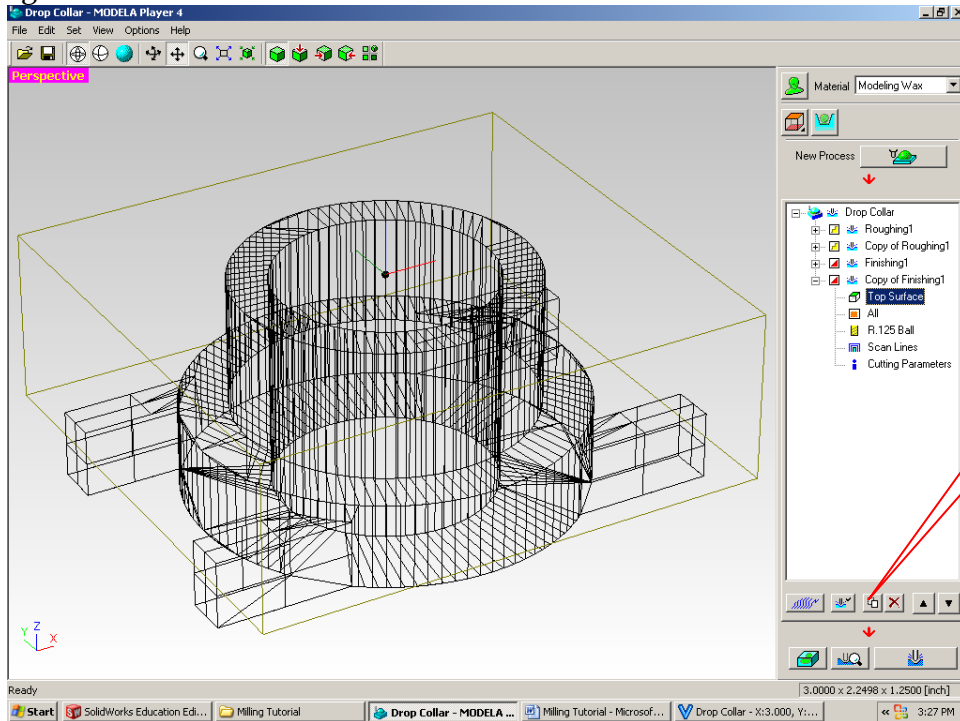Once again select *Copy Processes*. Then also switch the Top Surface to Bottom once again.

> Click the *Copy Process* button

<p align="center">Fig. 1- 46</p>

Make sure that the rough cut commands are not selected. Use the *Cutting/No Cutting* button to deselect those commands
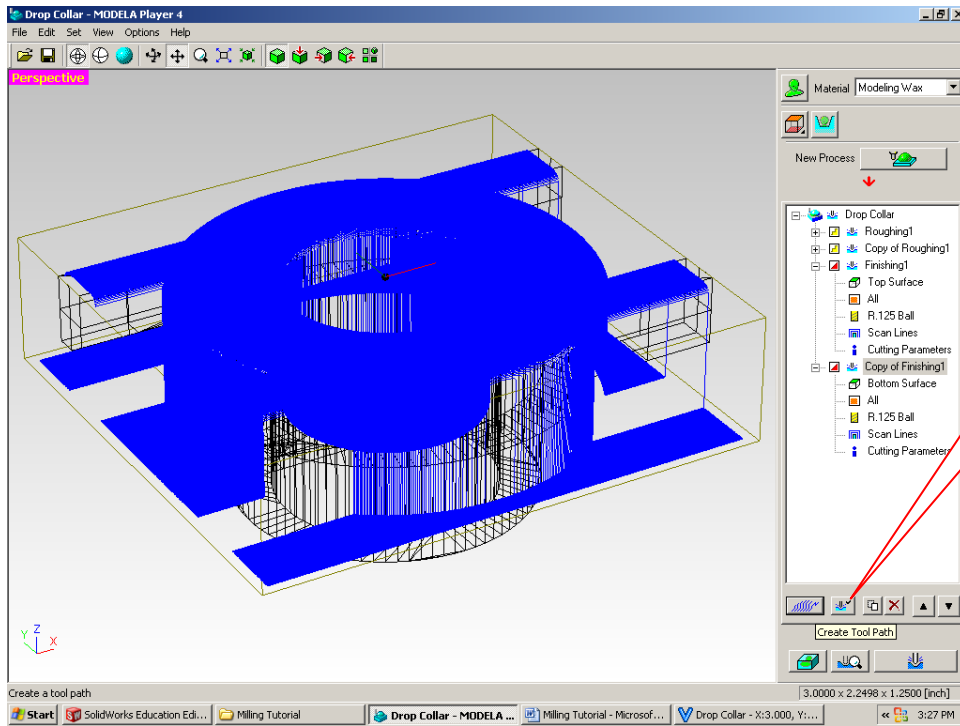

Click the *Cutting/No Cutting* button

Fig. 1- 47

Press cut once again to start the mill on the final pass.