



SRP WORKSHOP

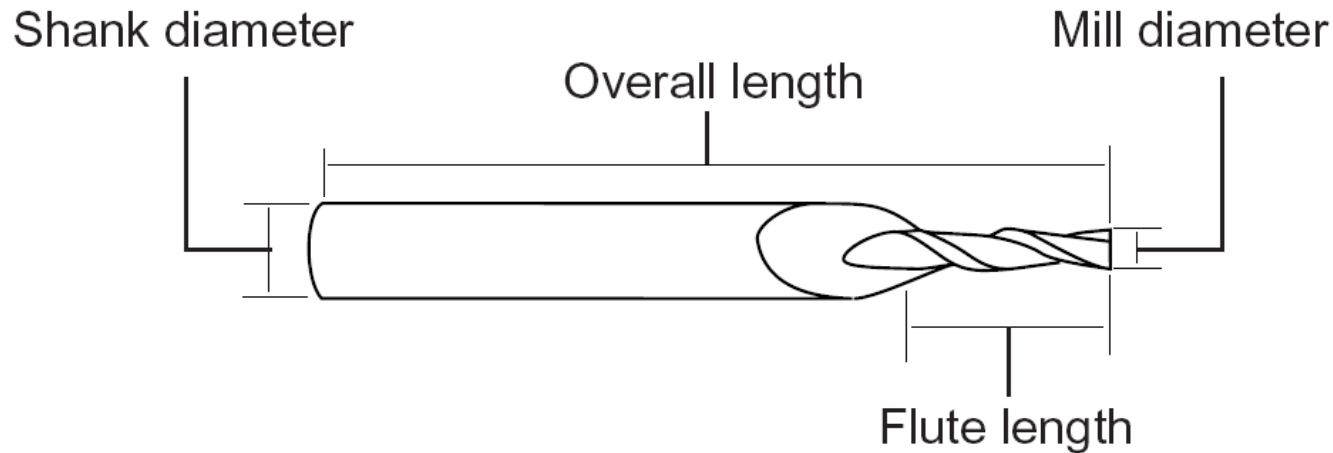
NOVEMBER 2008



End Mill Knowledge



End Mill Knowledge



NOTES:

❖ End Mill Materials

- **High Speed Steel or HSS**
 - Provides decent wear resistance and costs less than carbide end mills
 - Material is ductile and less prone to chipping
- **Carbide or Cemented Carbide**
 - Provides excellent wear resistance and hardness
 - Material offers better rigidity than HSS which enables the end mill to provide a higher degree of dimensional accuracy and superior surface finish
 - Can be run 2 – 3 times faster than HSS and are best for maximizing speed and tool life
 - Brittle material and can be chipped if dropped

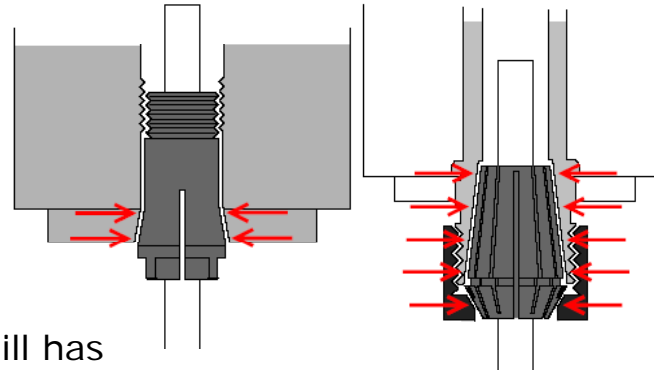




End Mill Knowledge

❖ Shank & Collet

- Shank is portion that is held by machine and used in conjunction with collet type holder
- Comes in standard sizes
 - 1/4", 1/8" for standard sizes
 - 6mm or 3mm for metric sizes



❖ Flute

- Number of cutting blades an end mill has
- Two flute end mills have greatest amount of flute space for more chip carrying capacity
- Three flute end mills have same flute space as two flute, but has a larger cross sectional area and thus provides greater strength
- Four or more flutes are ideal for finishing work only due to smaller flute space

Two Flute
Centercutting



Three Flute
Centercutting



Four Flute
Centercutting



Six Flute
Centercutting



Eight Flute
Centercutting



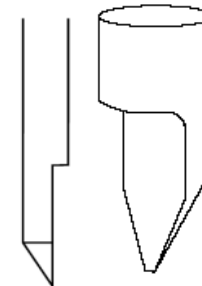
NOTES:



End Mill Knowledge

❖ End Mill Type

- **Flat or square end mill**
 - Used for cutting flat or stepped items
 - Prone to fail due to very small and brittle corners
- **Ball end mill**
 - Used for cutting curved surfaces and wavy shapes
 - Most common used
 - Usually stronger than flat end mills
- **Engraving tool**
 - Used for engraving text on name plates and rating plates



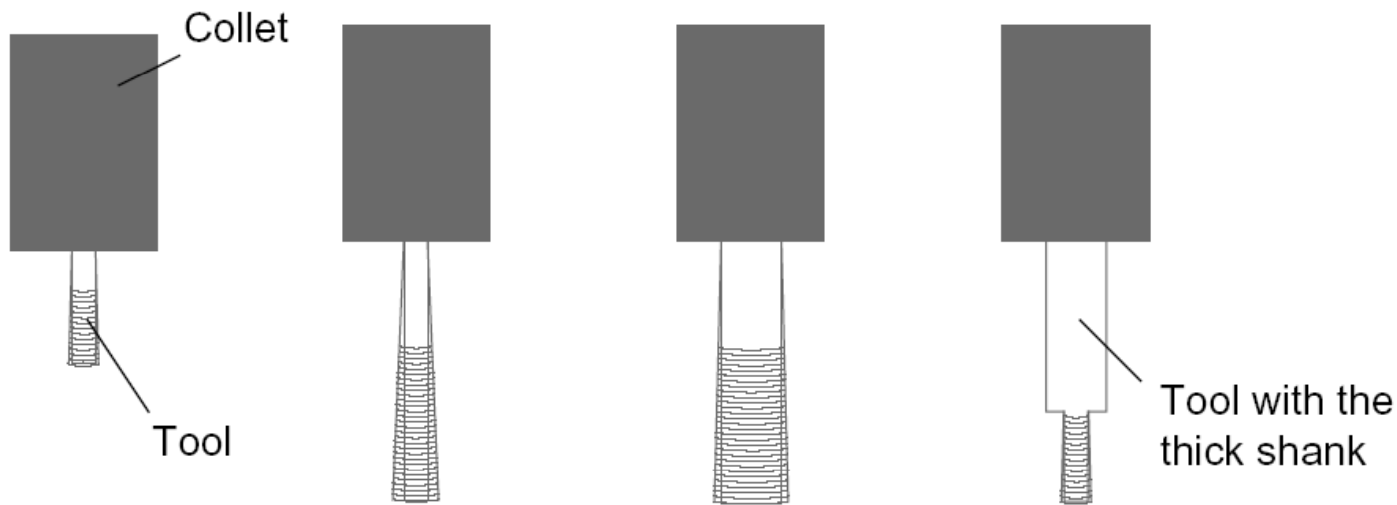
NOTES:



End Mill Knowledge

❖ End Mill Selection Tips

- Select shortest possible end mill for greatest rigidity
- Select multiple flutes for greater rigidity and better finishing
- Use largest diameter possible for added strength and rigidity



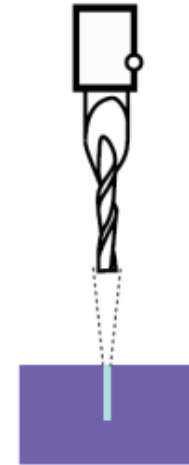
NOTES:



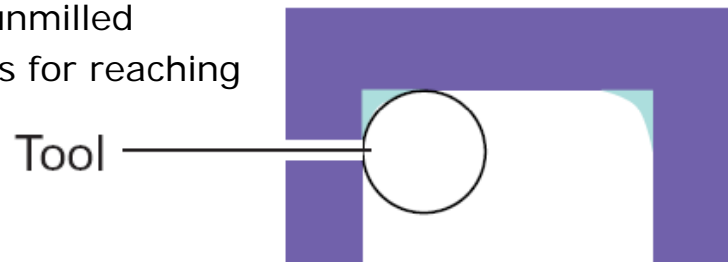
End Mill Knowledge

❖ End Mill Limitations

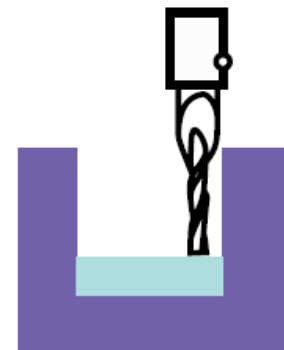
- Can't mill hole or feature smaller than tool diameter



- A large mill will leave corners unmilled
 - Use smaller diameter tools for reaching corners



- Can't mill a wall taller than length of tools reach.
 - Need longer fluted tool or long reach tool



NOTES:



End Mill Knowledge

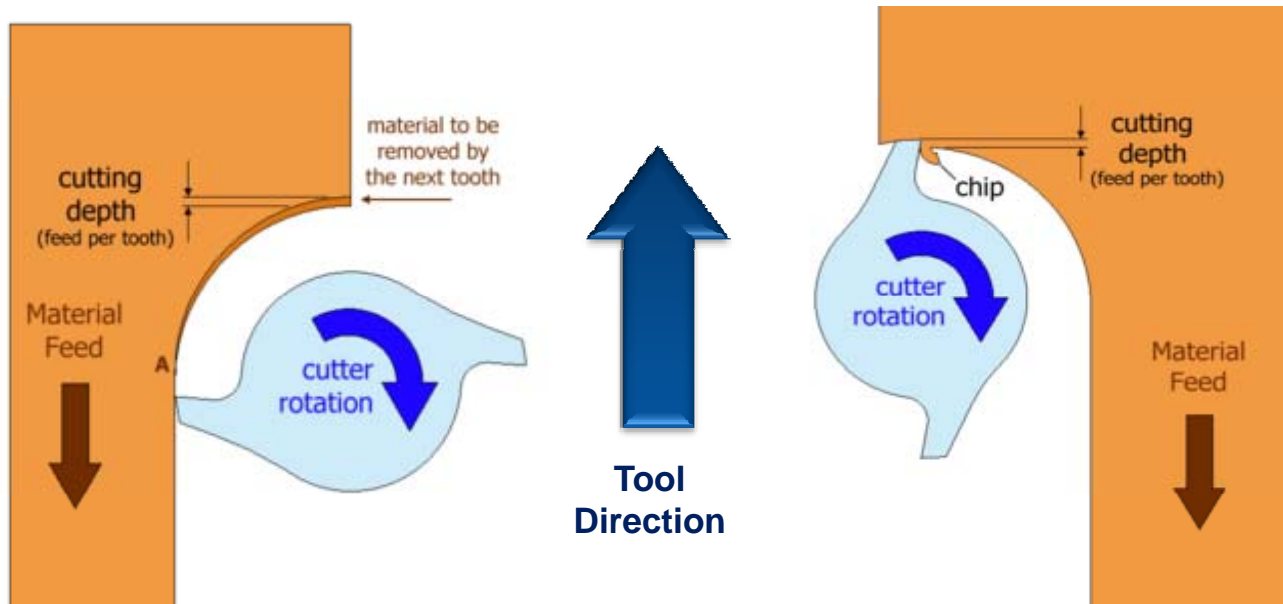
❖ Climb vs. Conventional Milling

•Conventional Milling

- Also known as “**Up**” milling
- Cutter gradually removes chip until it breaks off
- Usually leaves a poor finish on material

•Climb Milling

- Also known as “**Down**” milling
- Easier chip removal
- Better surface finish
- Longer tool life



NOTES:



End Mill Knowledge

❖ Common Milling Problems & Solutions

- **Excessive Chatter**

- Problem:
 - Vibration and sound are excessive when the tool engages the workpiece
- Possible Solutions:
 - Reduce cutting forces by reducing speed or depth of cut
 - Increase system rigidity by changing to a shorter end mill or improving your work piece fixturing

- **Poor Surface Finish**

- Problem:
 - Work Surface looks uneven and feels rough
- Possible Solutions:
 - Increase system rigidity
 - Increase speed
 - Reduce depth of cut
 - Reduce cutting forces
 - Change to an end mill with more flutes

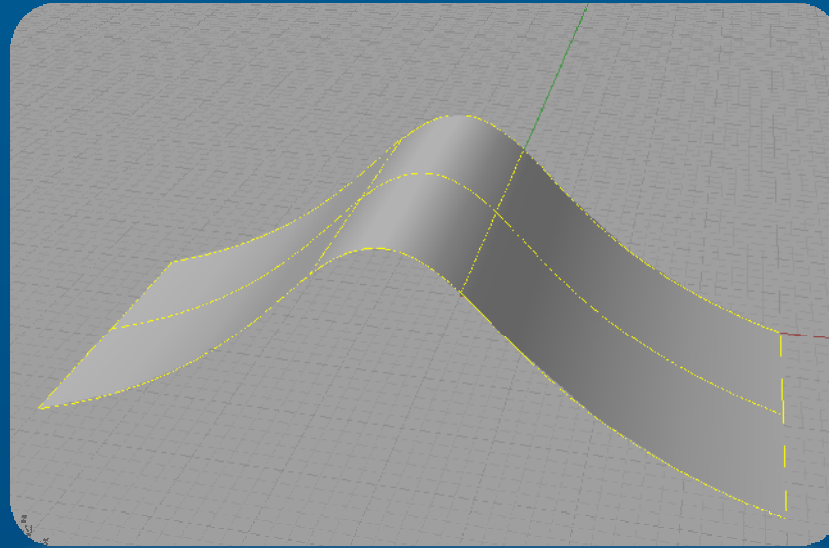
NOTES:



End Mill Knowledge

- **Excessive Wear on End Mill**
 - Problem :
 - Tools is wearing at cutting edges causing poor performance
 - Possible Solutions:
 - Reduce speed – 50% reduction in speed will almost double tool life
 - Increase/Decrease feed – Feed rate that is too light will cause excess rubbing
 - Change geometry of tooling – number of flutes, length of cut
 - Change material and or add a coating

NOTES:



File Formats Knowledge

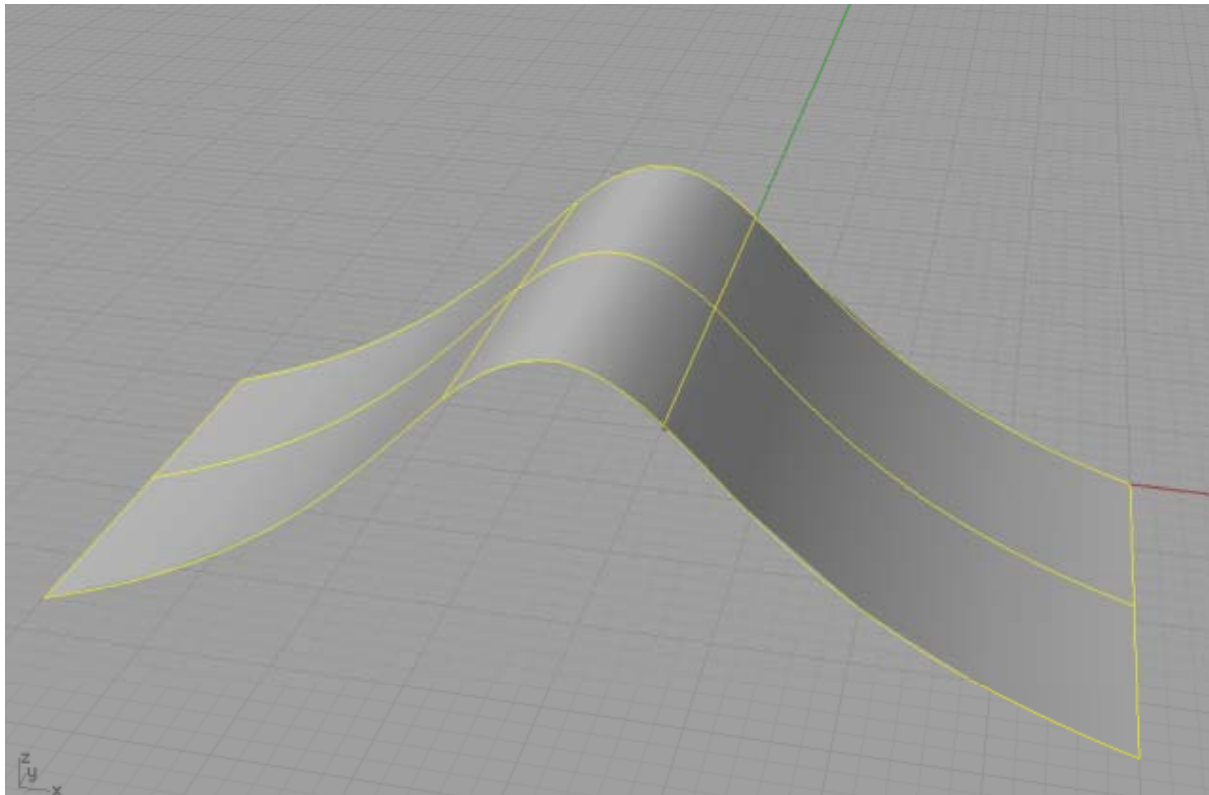


File Format Knowledge

❖ NURBS vs. Polygons (Mesh)

- **NURBS**

- Non-Uniform Rational B-Splines. Nurbs curves are two dimensional curves whose shapes are determined by a series of control points. When a series of curves are joined together, they form a three dimensional Nurbs surface.
- More commonly used to model organic curved surface objects.

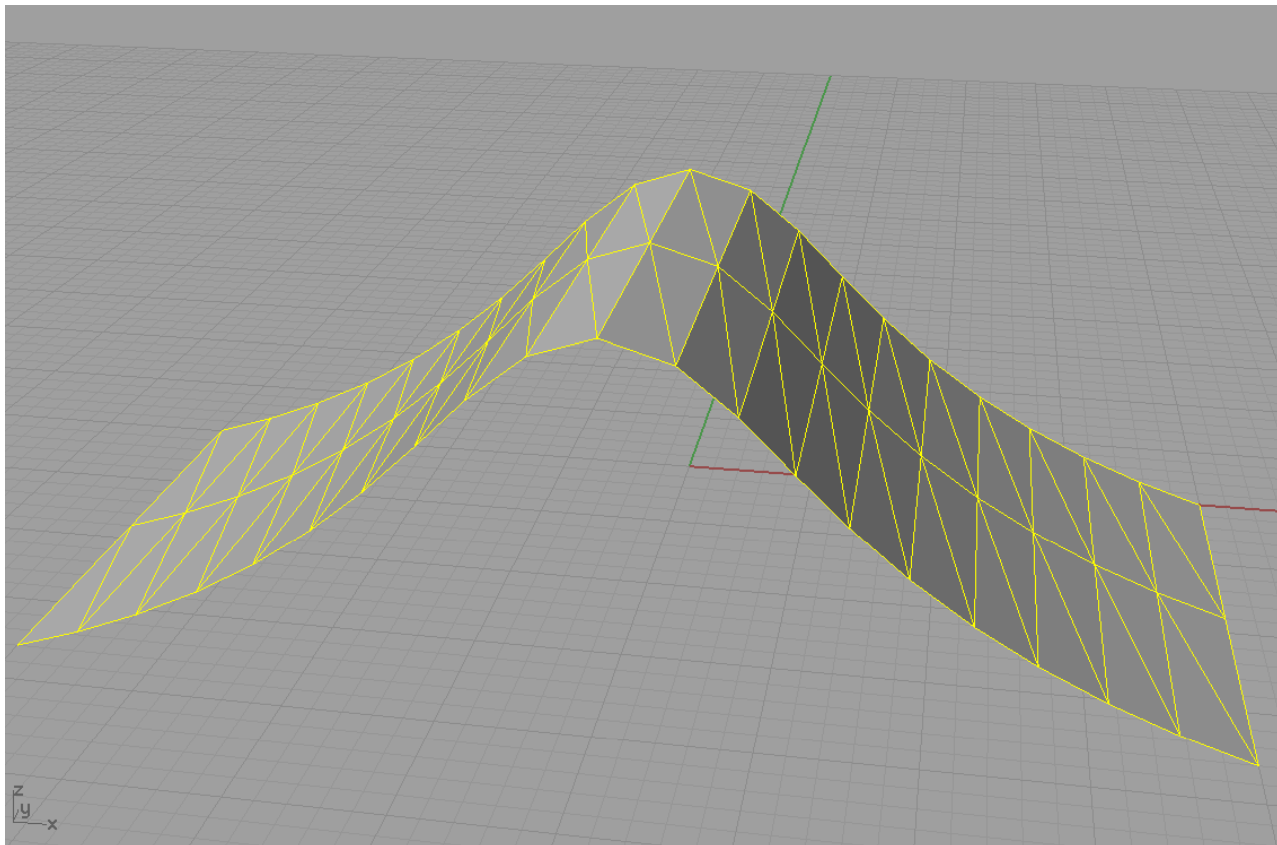


NOTES:



File Format Knowledge

- **Polygon**
 - A geometry element formed by connecting three or more points. A triangle or three point polygon is the simplest form of polygon geometry. It is a quick way of modeling three dimensional objects but does not easily generate smooth curved surfaces



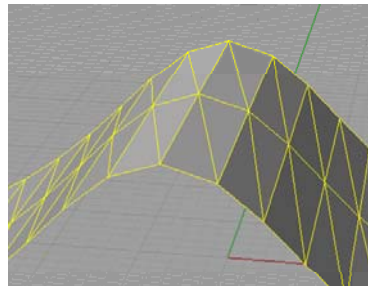
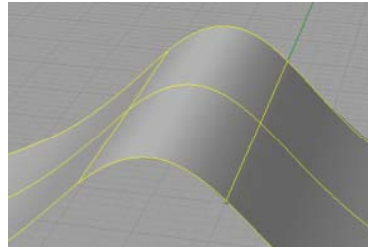
NOTES:



File Format Knowledge

❖ Common Examples

- **NURBS**
 - IGS
 - 3DM
- **Mesh**
 - STL
 - DXF



❖ What Format Does Roland Software Need?

- Roland software packages require STL files to create cutting tool paths. IGS files will also work, however STL files are the most common.
- All CAD or design software will export to STL type files

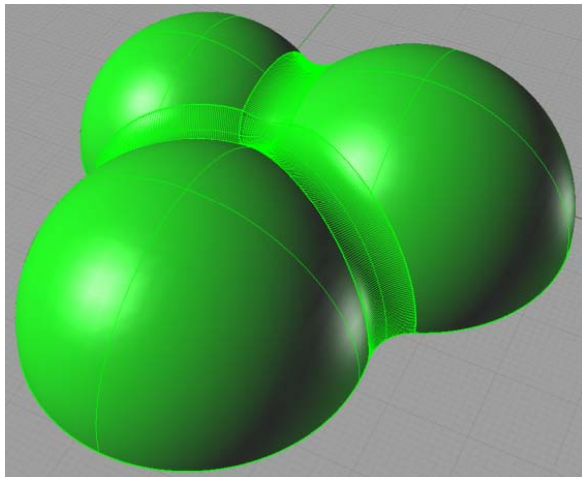
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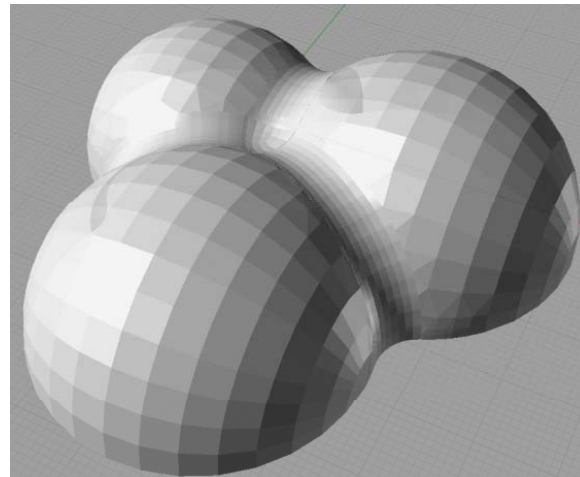
File Format Knowledge

❖ How Much Detail Should be Exported?

- When creating an STL file, you can select the level of detail desired.
- Below are a few examples of different STL details.



Original Surface
File

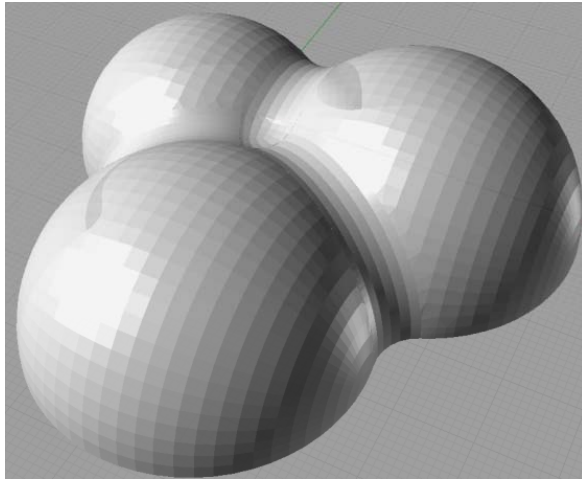


Large Mesh

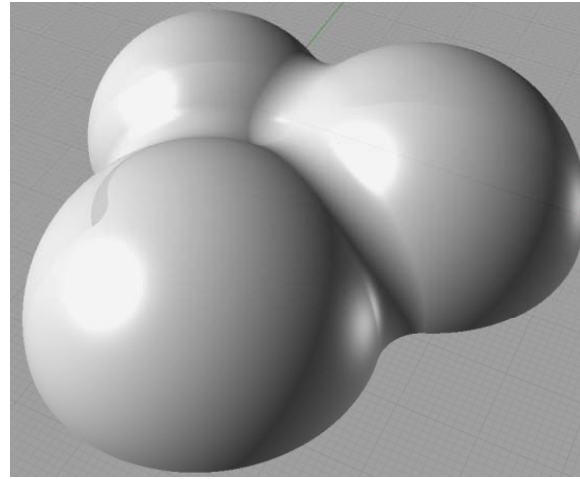
NOTES:



File Format Knowledge



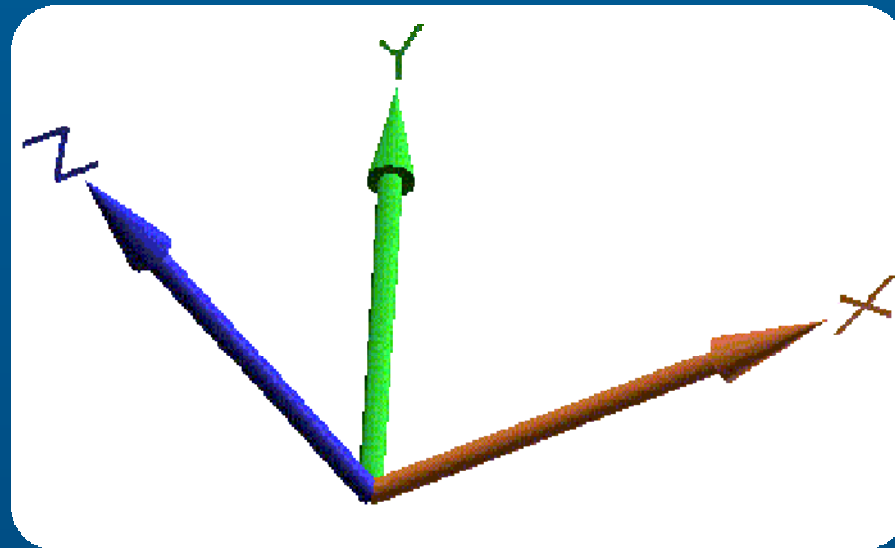
Medium Mesh



Small Mesh

- The smaller the mesh, the larger the file will be and the longer it will take to cut.
- You want to use a mesh size that is suitable for your parts and needs.

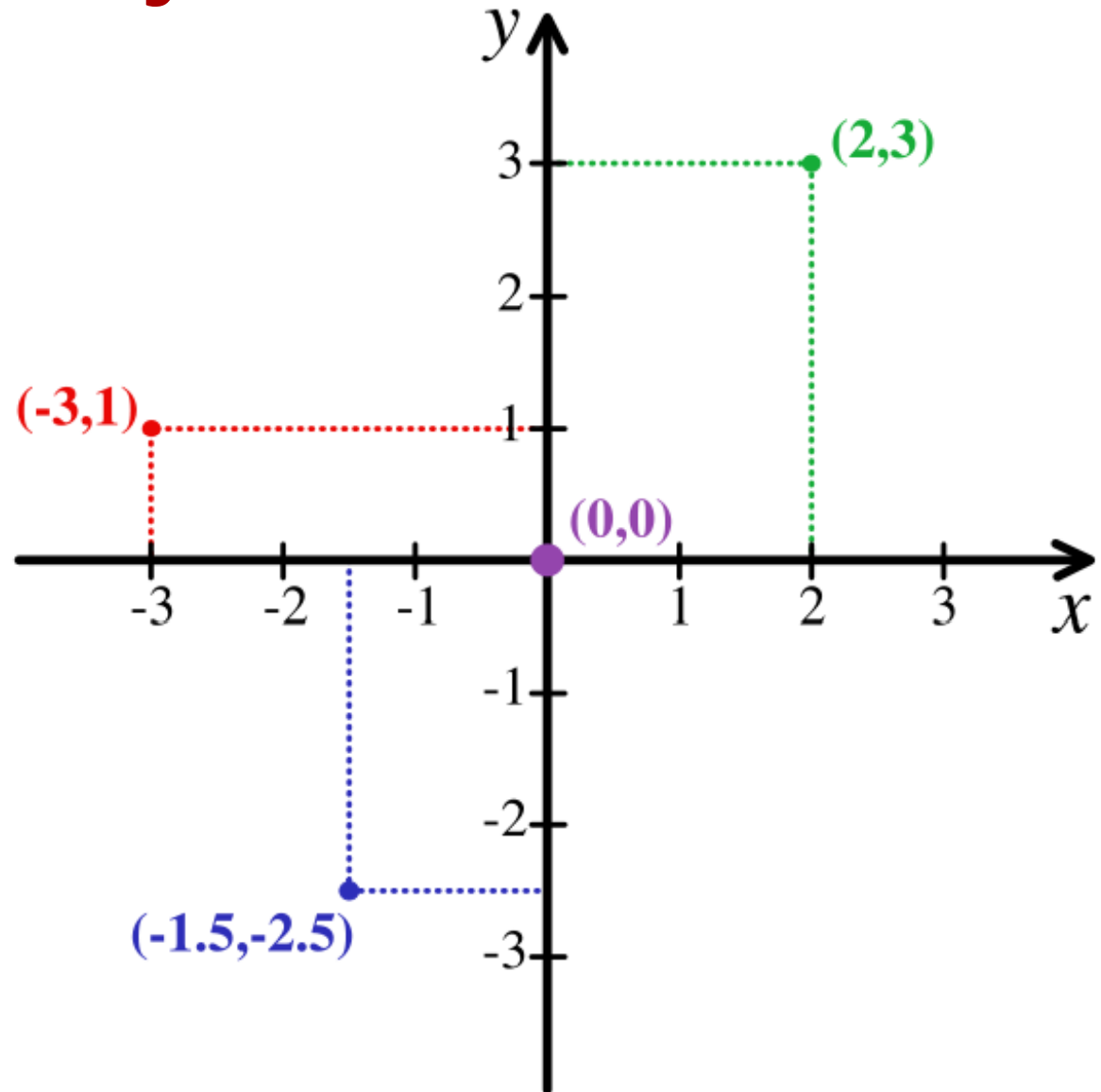
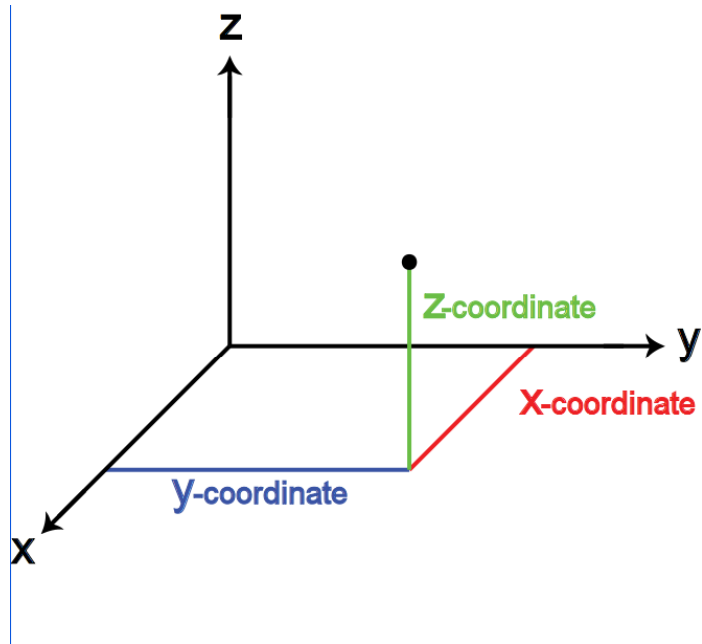
NOTES:



Axis Movements

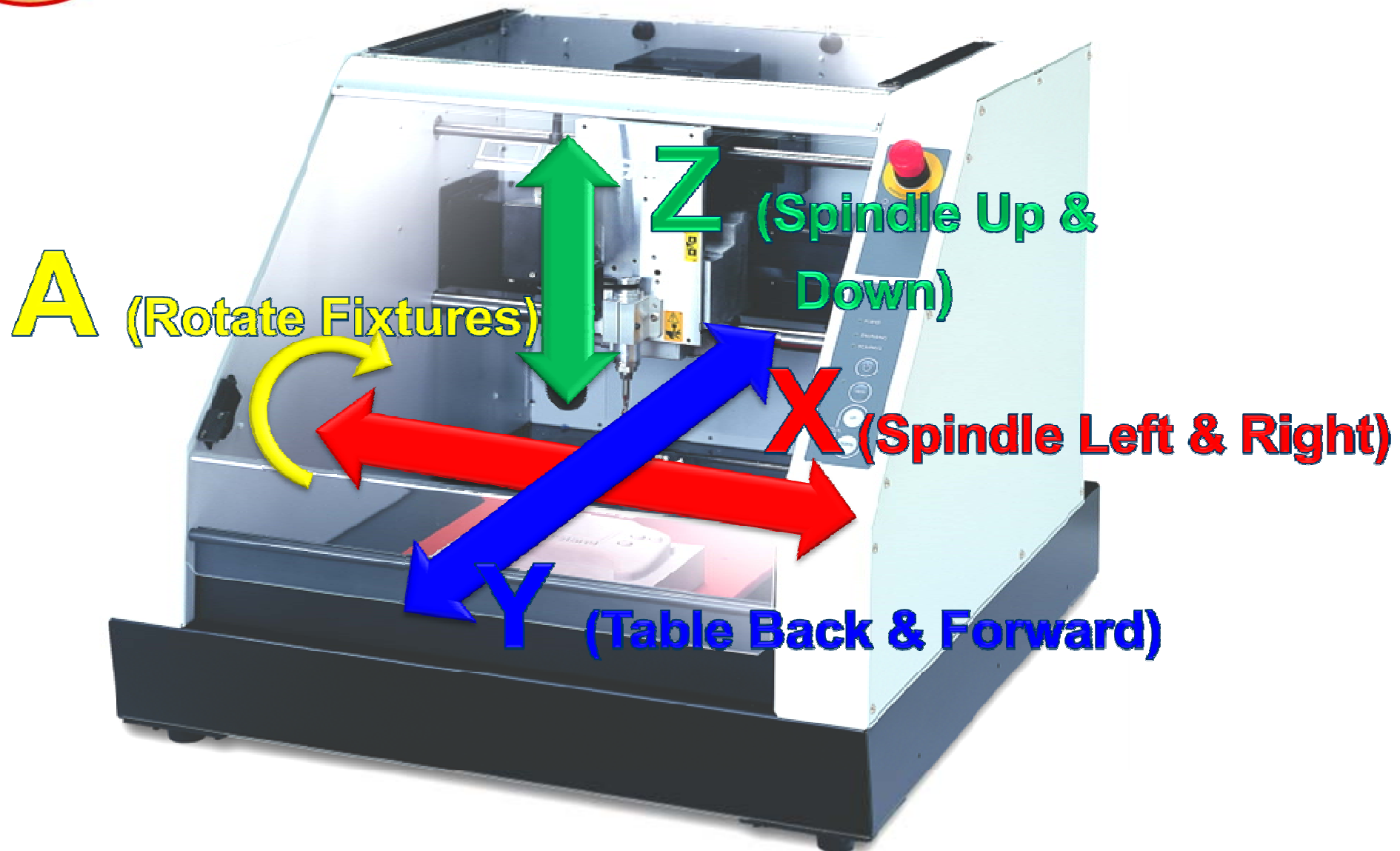


Coordinate System Basics





MDX-40





 Roland

SRPTM
Player

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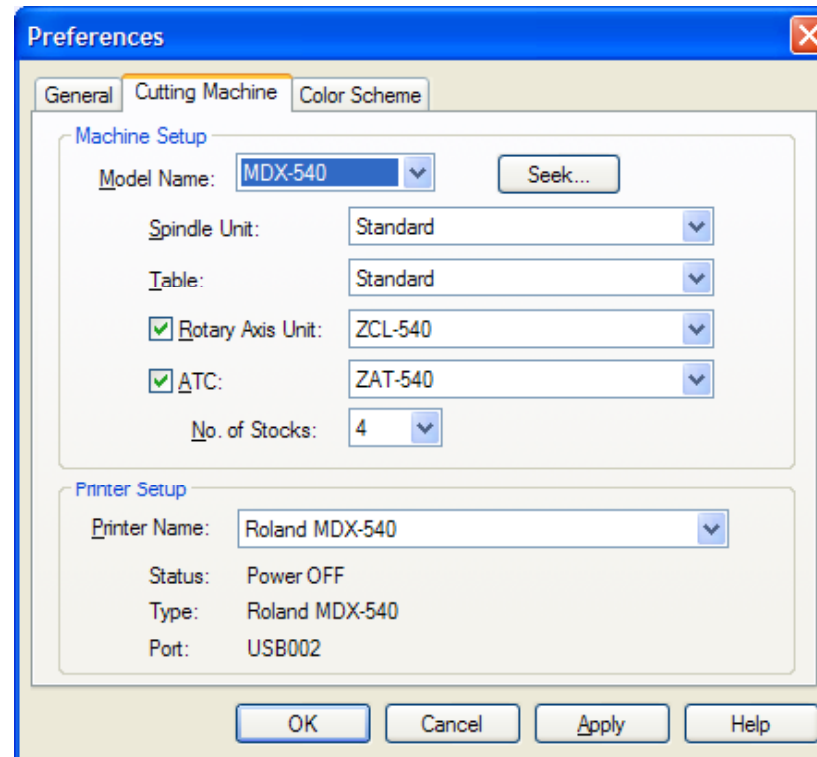
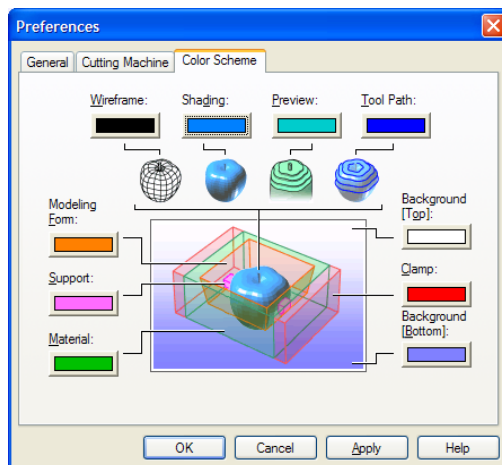
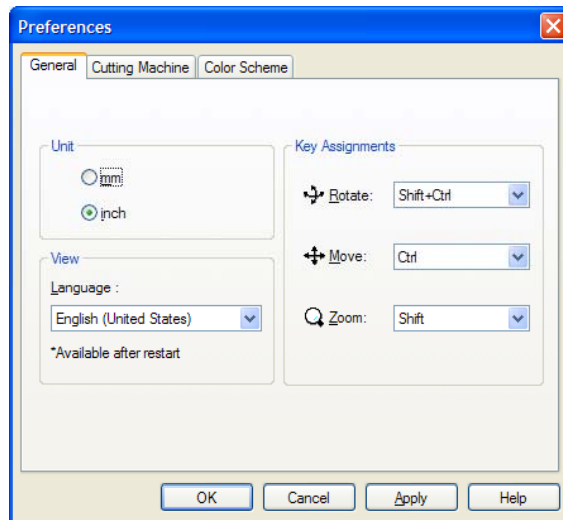
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SRP Player CAM Software



SRP Player

❖ File - Preferences



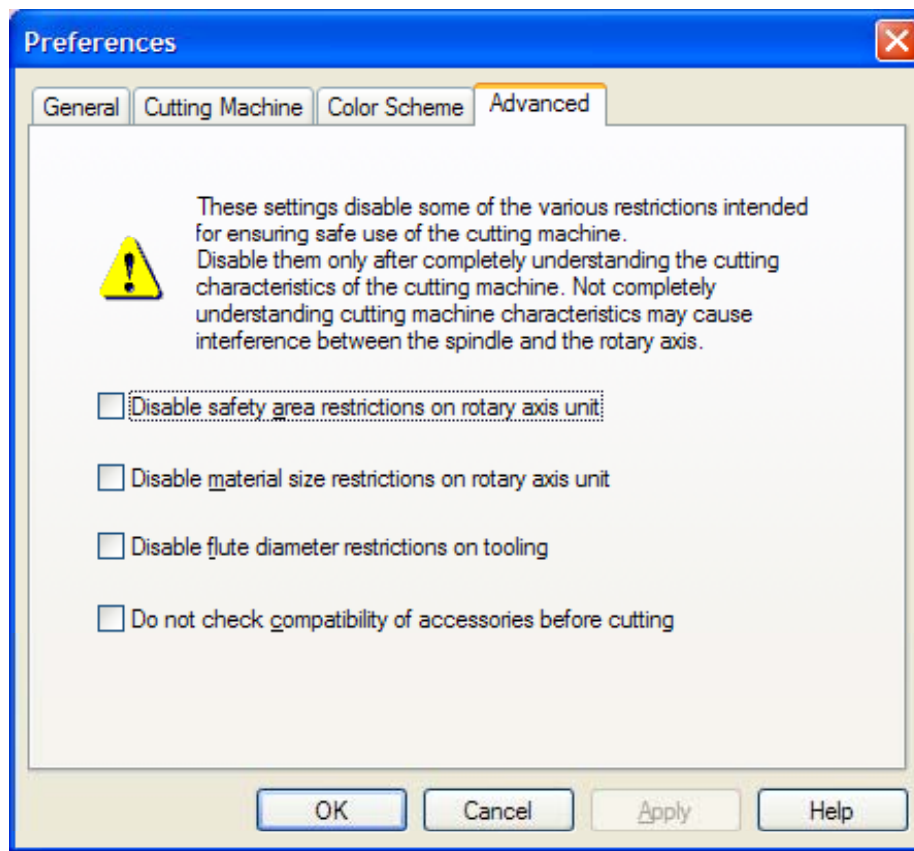
NOTES:

You can change your preferences, color scheme, machine and accessories in this section.



SRP Player

❖ File – Preferences – Advanced Tab



NOTES:

- For software versions 1.15 and greater, there is an advanced tab that will allow you to disable certain safety features for advanced users.
- Please be very familiar with the machine and any accessory before disabling these restrictions.
- Failure to do so may cause a crash.



SRP Player

❖ Options

My Tool

Check the box for the tool you're using.

<input type="checkbox"/>	<input checked="" type="checkbox"/>	8mm Square
<input type="checkbox"/>	<input checked="" type="checkbox"/>	10mm Square
<input type="checkbox"/>	<input checked="" type="checkbox"/>	0.13mm Conical
<input type="checkbox"/>	<input checked="" type="checkbox"/>	0.2mm Conical
<input type="checkbox"/>	<input checked="" type="checkbox"/>	0.25mm Conical
<input type="checkbox"/>	<input checked="" type="checkbox"/>	1mm Conical
<input type="checkbox"/>	<input checked="" type="checkbox"/>	1/32" Ball
<input type="checkbox"/>	<input checked="" type="checkbox"/>	1/16" Ball
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1/8" Ball
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1/4" Ball
<input type="checkbox"/>	<input checked="" type="checkbox"/>	1/32" Square
<input type="checkbox"/>	<input checked="" type="checkbox"/>	1/16" Square
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1/8" Square
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1/4" Square
<input type="checkbox"/>	<input checked="" type="checkbox"/>	0.125 Square

Tool Specifications

Tool: 1/4" Square

Tool Type: Straight

Material: Cemented carbide

Flute Diameter [d]: 0.2500 inch

Flute Length [l]: 0.7465 inch

Corner Radius [r]: 0.0000 inch

Blade Width [w]: 0.0000 inch

Blade Angle [a]: 0.00 deg

OK Cancel

Add/Remove Tool

Tool Specifications

Tool Name: New tool-1

Tool Type: Straight

Material: High-speed steel

Flute Diameter [d]: 0.2362 inch

Flute Length [l]: 0.9843 inch

Corner Radius [r]: 0.0000 inch

Blade Width [w]: 0.0000 inch

Blade Angle [a]: 0.00 deg

Register

New Copy Delete Cutting Parameters...

OK Cancel

Surfing

Material: Aluminum

Tool: 1/4" Ball

Orbit Direction: Up Cut

Depth: 0.0000 inch

X: 0.0000 inch Y: 0.0000 inch

OK Cancel

NOTES:

My Tool: Select what tools you have available

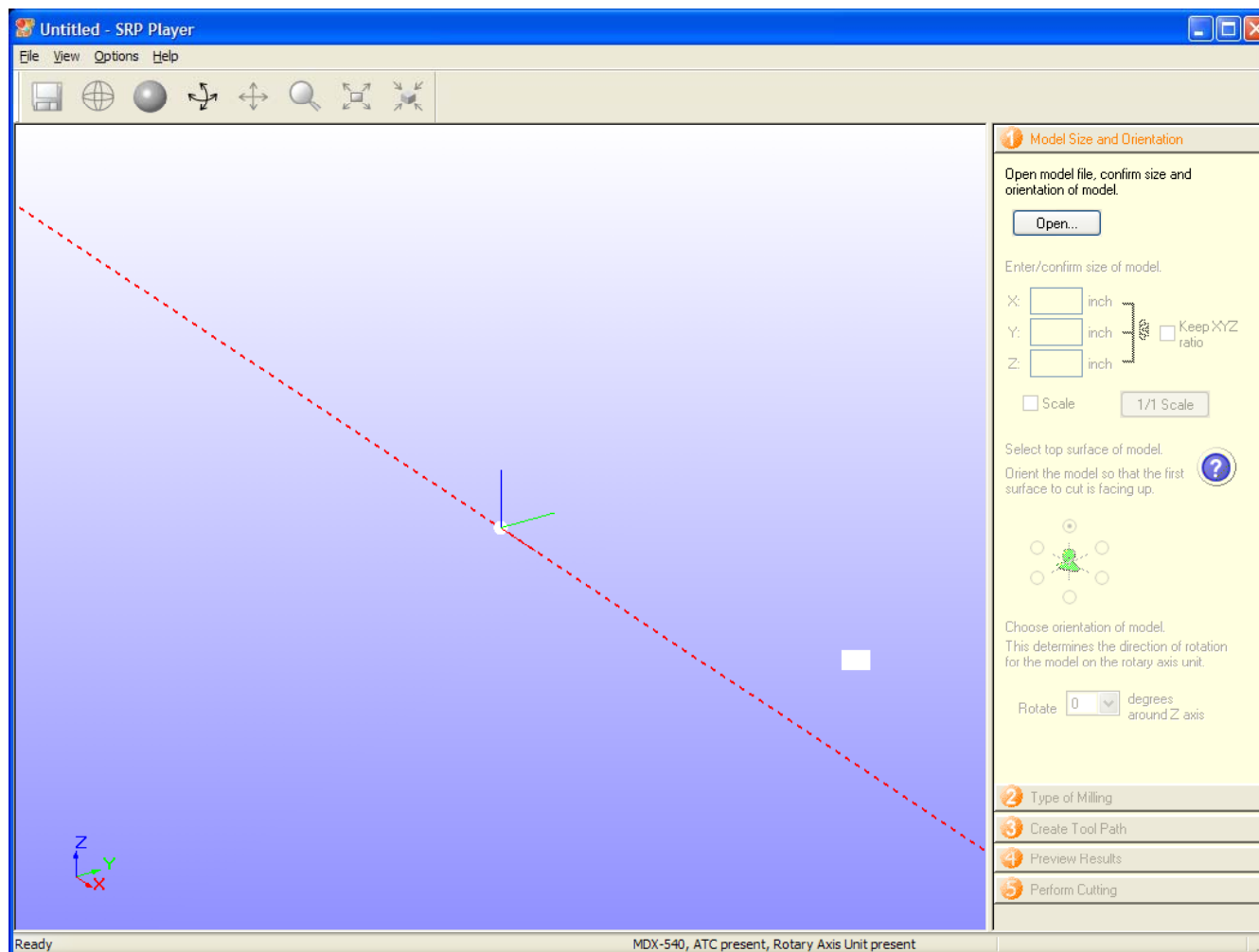
Add/Remove Tool: Add or remove additional tools than already installed.

Surfing: Surfaces work material using available tools.



SRP Player

❖ Main Screen



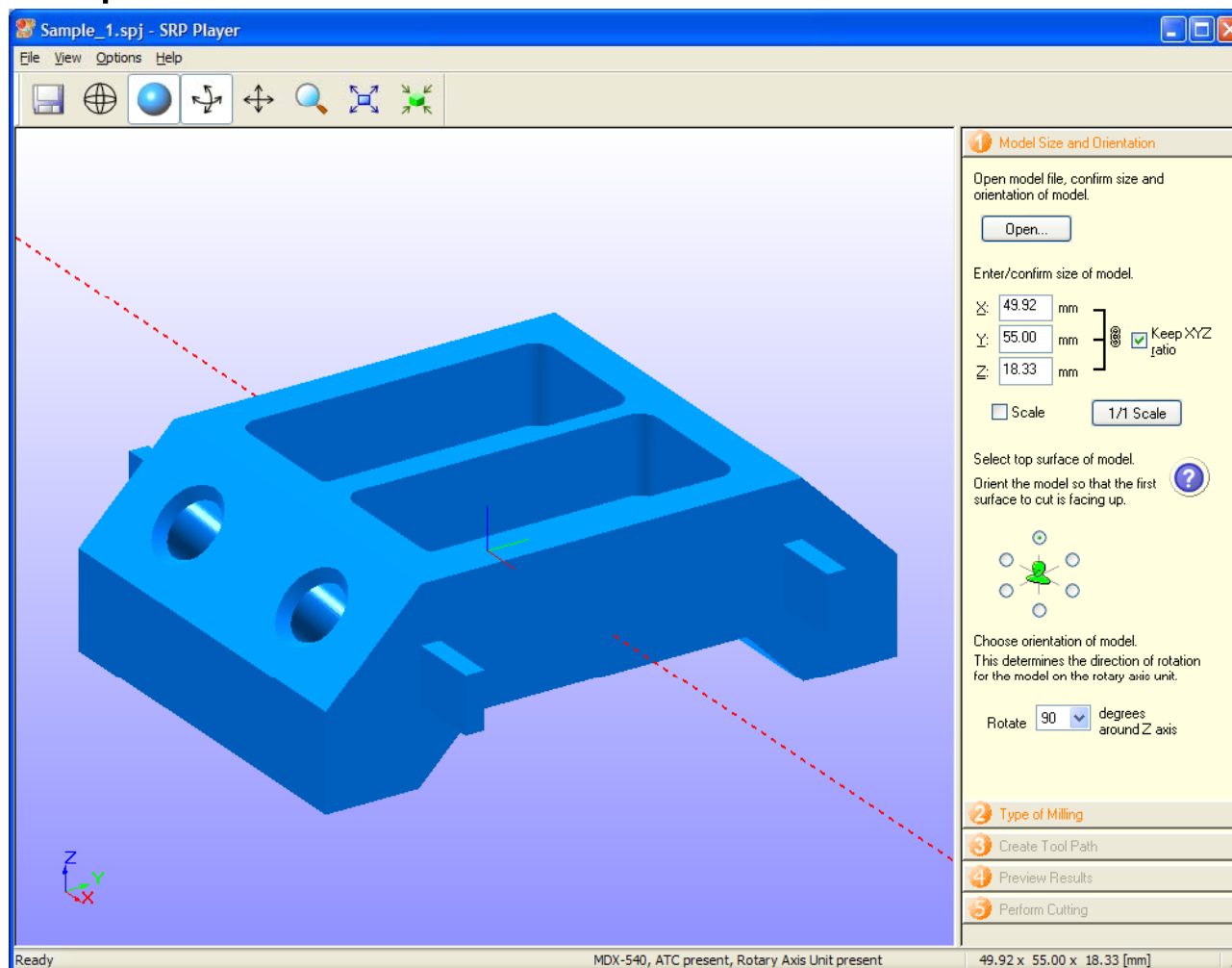
NOTES:

- Start screen. Note you can't proceed until Step 1 is completed.
- Red line demonstrates rotary axis rotation axis if available.



SRP Player

❖ Step 1



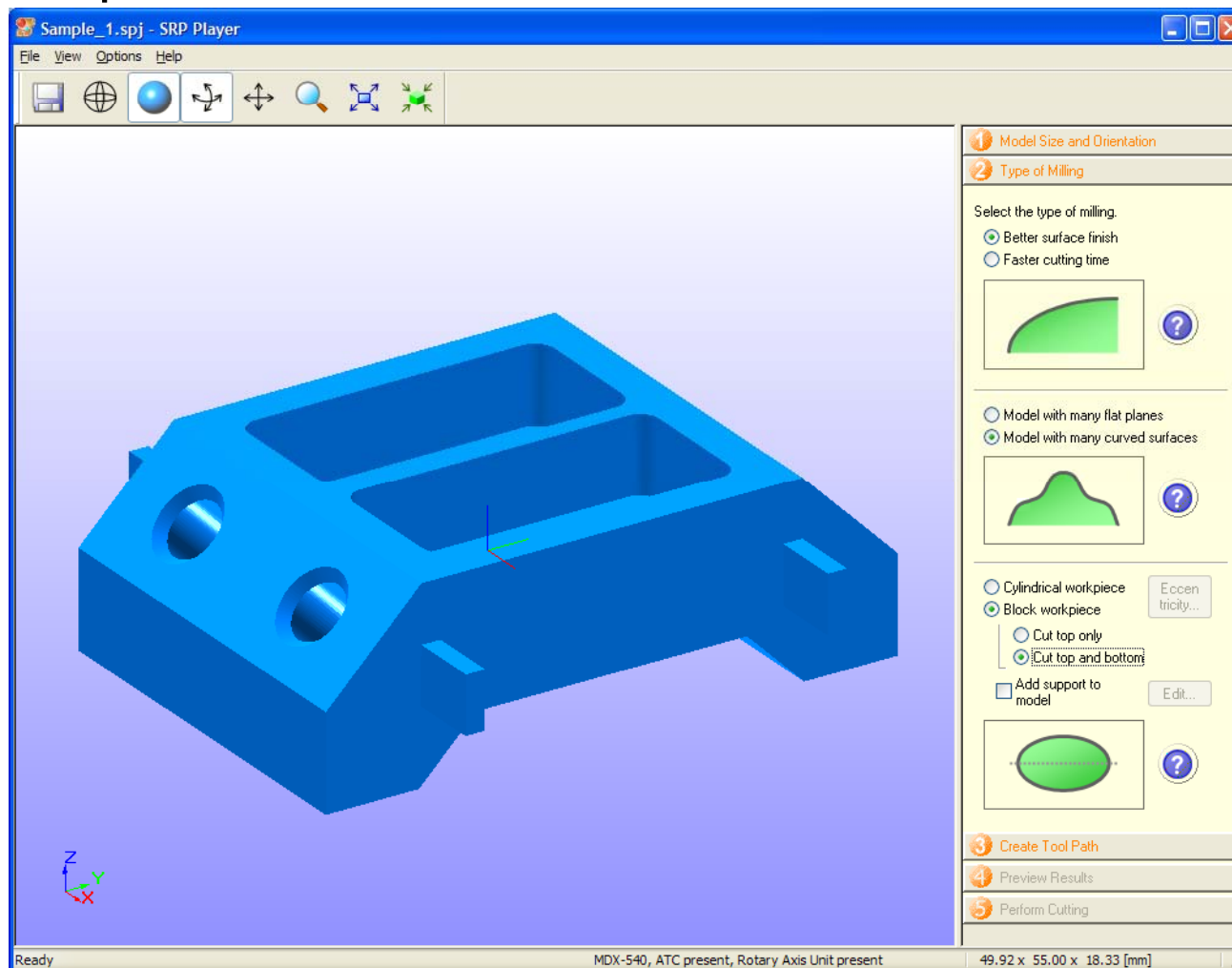
NOTES:

- Import part by clicking on Open or dragging part onto screen.
- Confirm size of part.
 - Modify if desired.
- Check orientation of part.
- Click on Step 2 when finished.



SRP Player

❖ Step 2



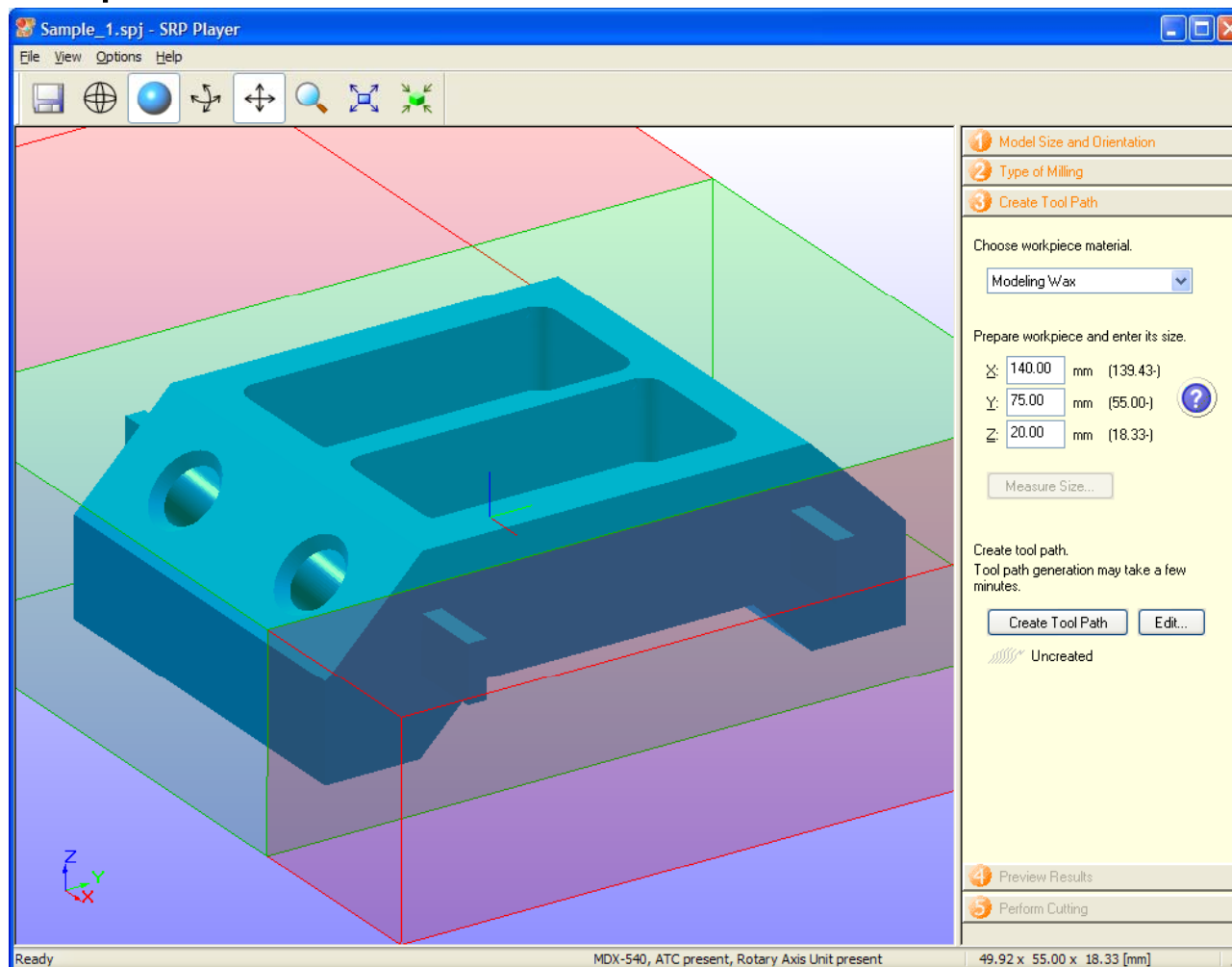
NOTES:

- You select what type of part you will be cutting by selecting the appropriate options.
- Click on question mark for more information.
- Click on Step 3 when finished.



SRP Player

❖ Step 3



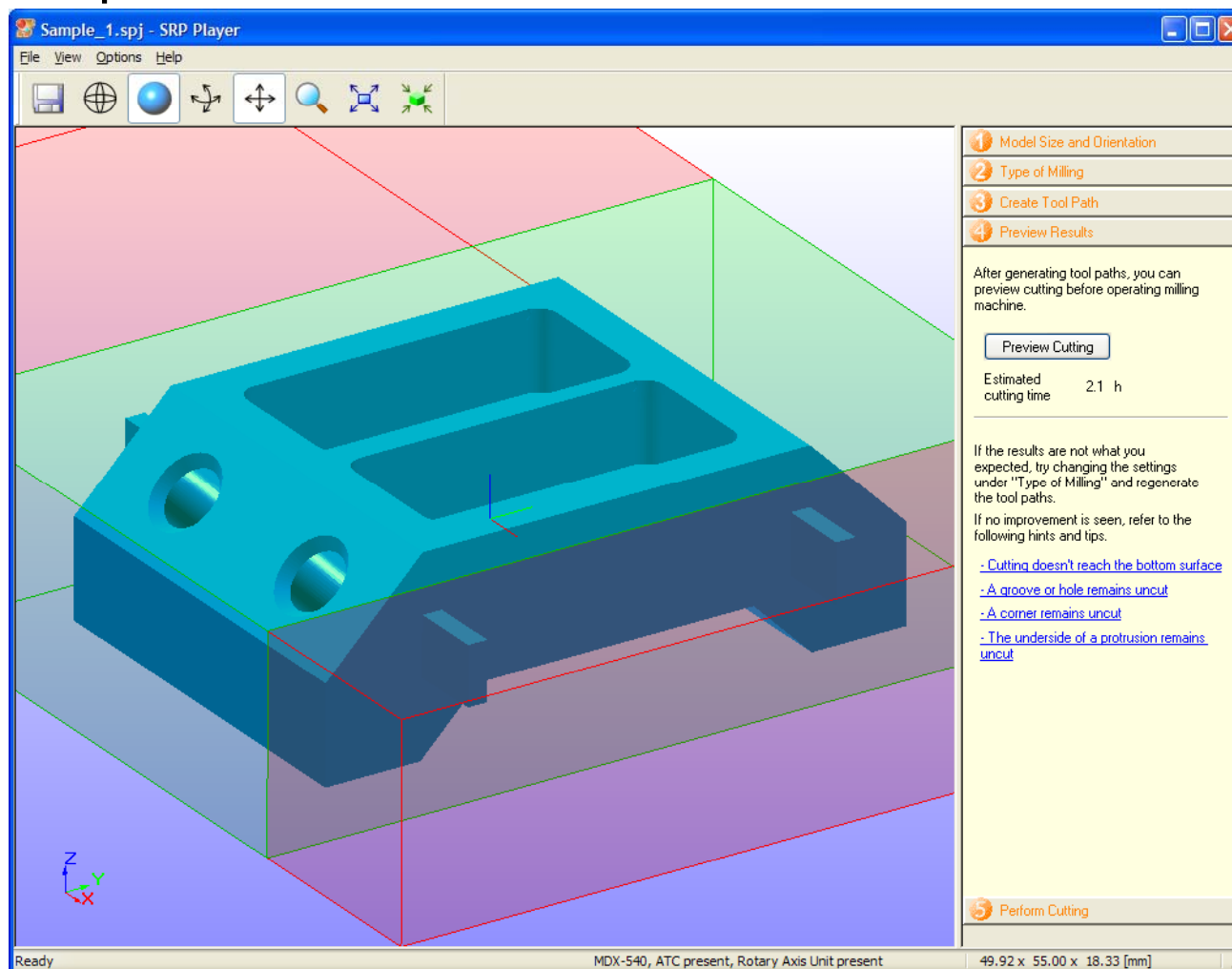
NOTES:

- Select material from pull down list.
- Enter material size.
 - Must be greater than values in parenthesis.
- Click Create Tool Path to process toolpath.
- Click on Step 4 when finished.



SRP Player

❖ Step 4



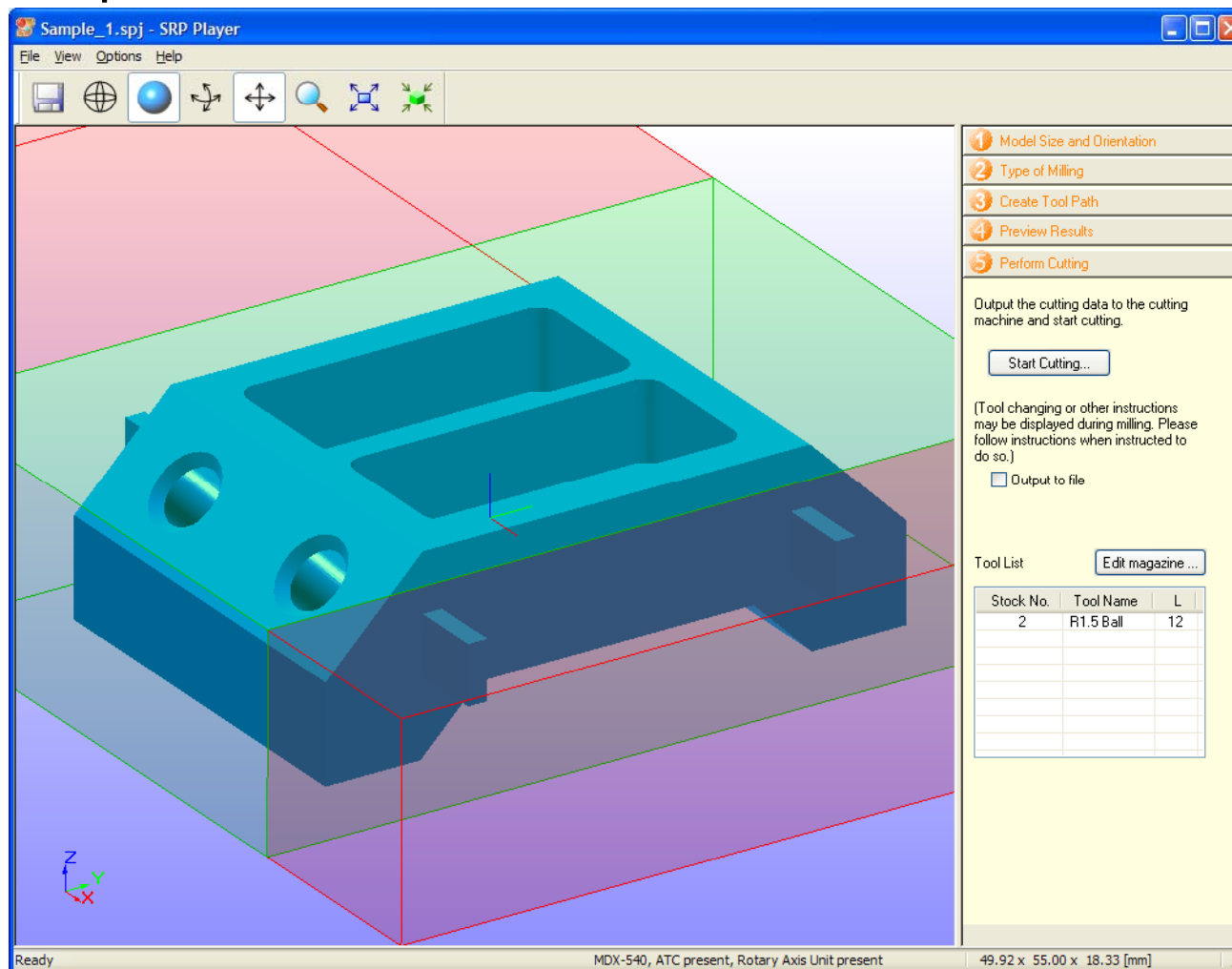
NOTES:

- You can view what the sample part will look like with selected tooling by clicking on Preview Cutting.
- You can view an estimated cutting time.
- Click on Step 5 when finished.



SRP Player

❖ Step 5



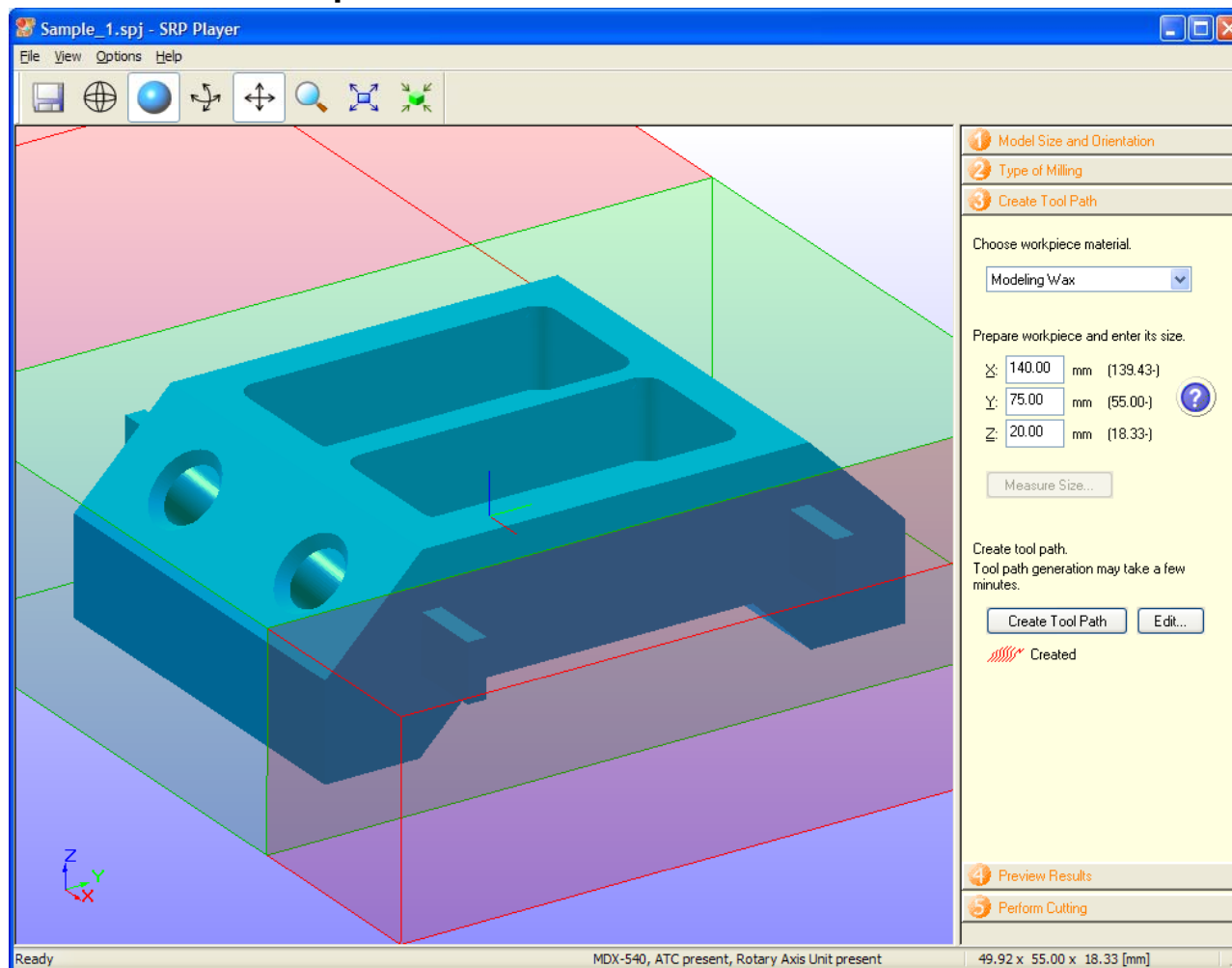
NOTES:

Click on Start Cutting to starting the cutting process.



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❖ Back to Step 3



NOTES:

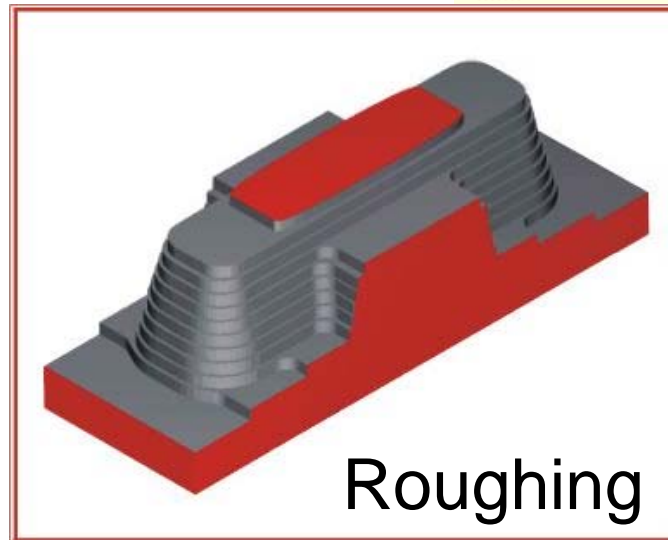
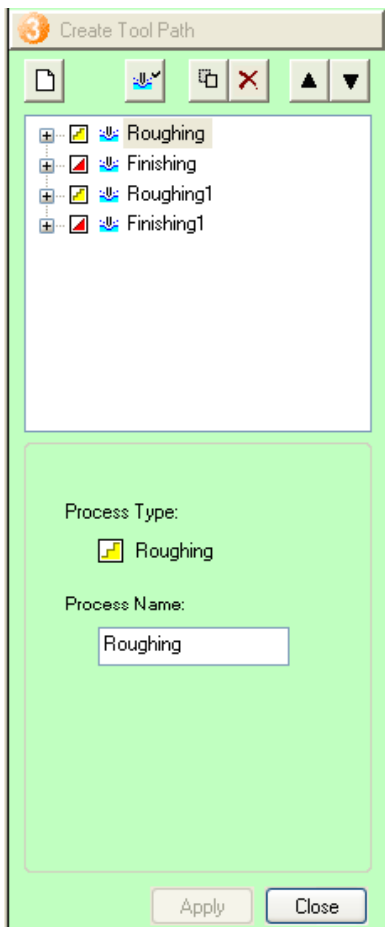
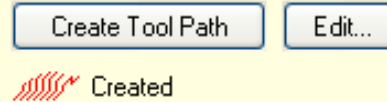
If you would like to make changes to your program, click on Step 3.



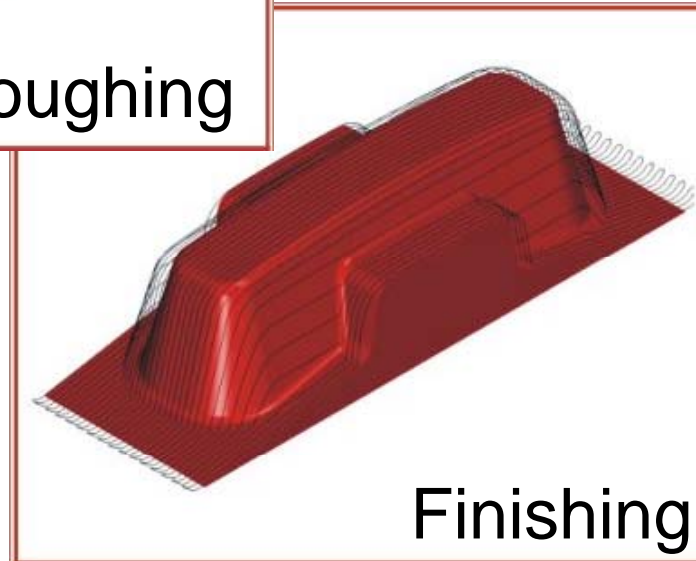
SRP Player



❖ Step 3 Modifications



Roughing



Finishing

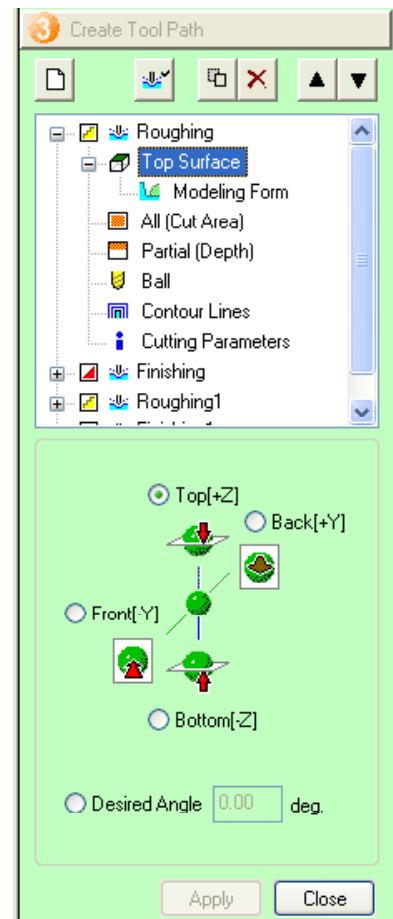
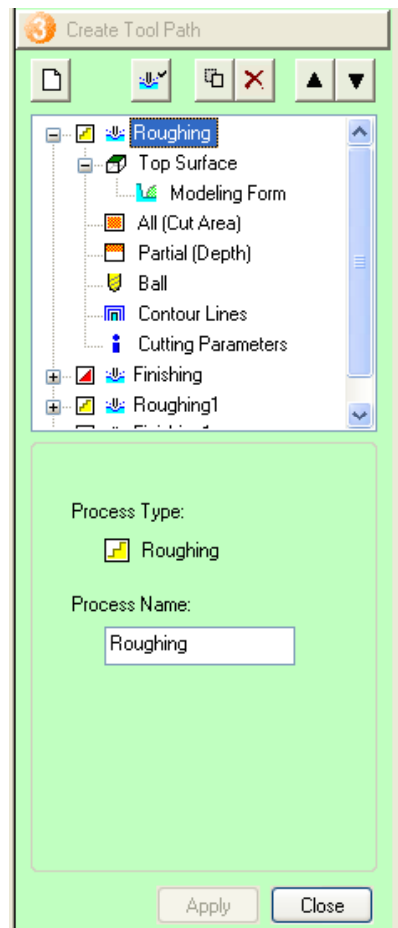
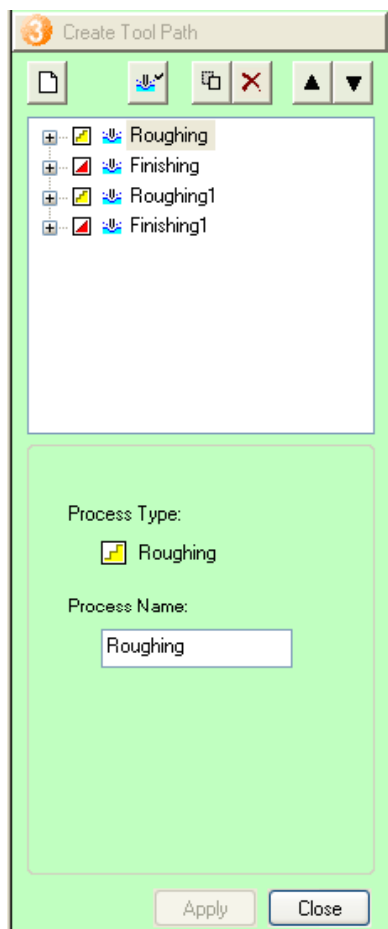
NOTES:

- Click on Edit.
- You can view and edit your processes as desired.
- Roughing** process quickly removes material leaving a rough finish, usually with a larger tool.
- Finishing** process cleans up the part to its final shape.



SRP Player

❖ Step 3 Modifications



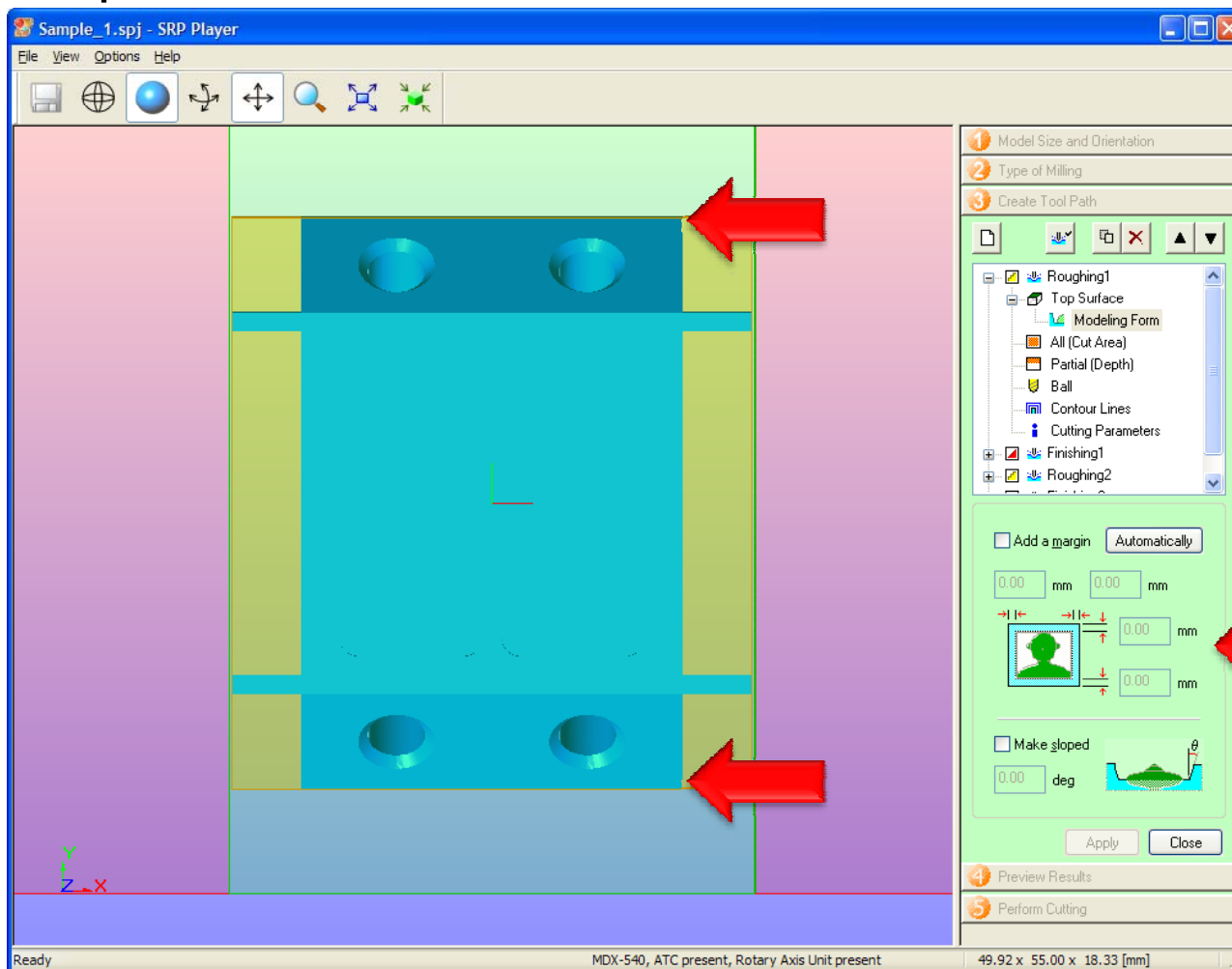
NOTES:

- Select Roughing process
- Select Top Surface and click on + to view options.
- You can rename the process
- You can change its orientation and angle if available.
- Click on Apply when finished.



SRP Player

❖ Step 3 Modifications



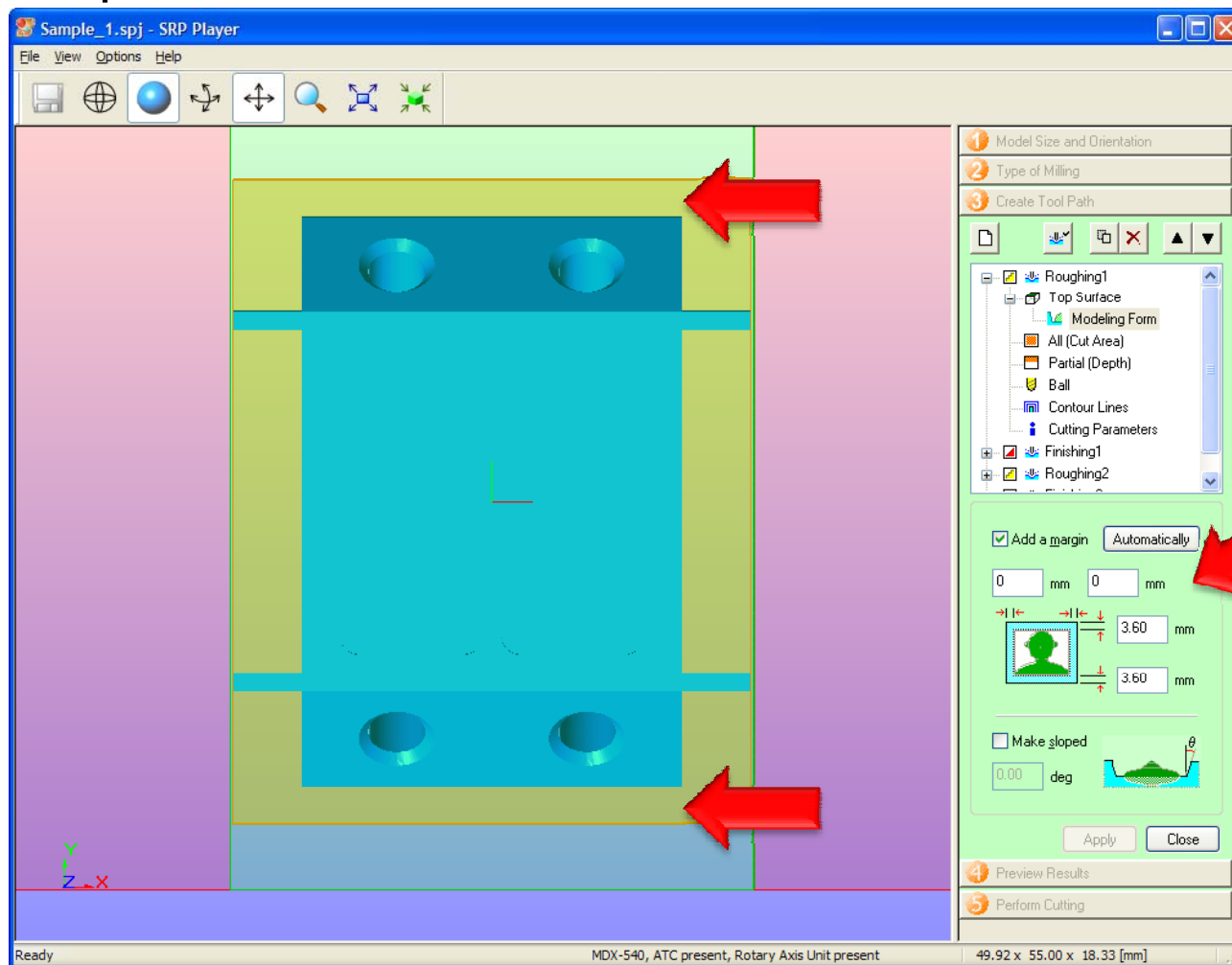
NOTES:

- Under Modeling Form, you can change the margins of the part.
- Click on Add a margin
- Click on Automatically
- You only need to add a margin above and below the part.
- You don't want to add a margin to the left or right.
- Once finished click Apply.



SRP Player

❖ Step 3 Modifications



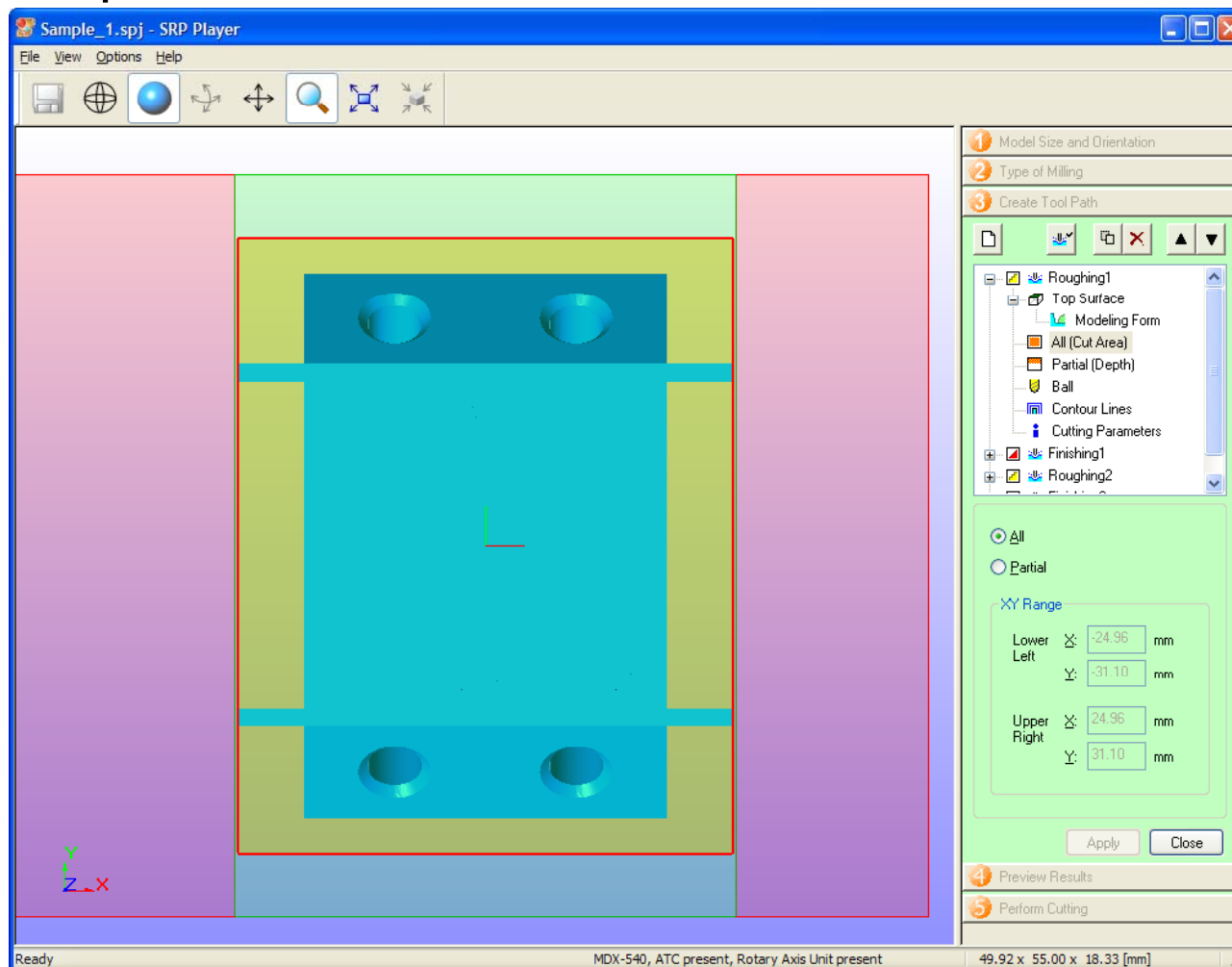
NOTES:

- Completed margin modifications.



SRP Player

❖ Step 3 Modifications



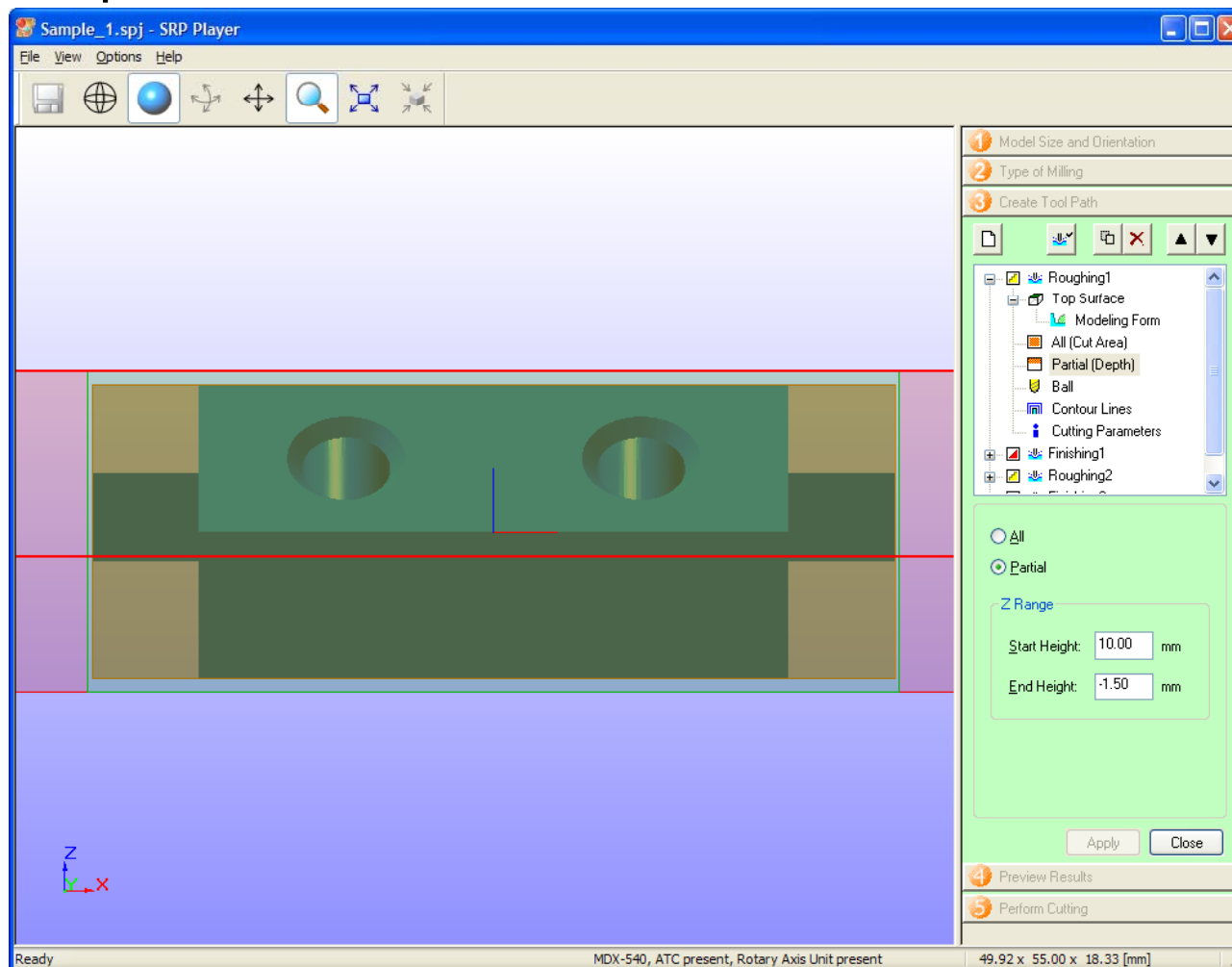
NOTES:

- You can modify the Cutting Area if desired by selecting Partial.
- You can enter values to specify the cutting area or drag the red box to the desired area.
- Click on Apply when finished.



SRP Player

❖ Step 3 Modifications



NOTES:

- The cutting depth can be modified by selecting Partial.
- Enter a value or drag the red line to the desired depth.
- Click on Apply when finished.



SRP Player

❖ Step 3 Modifications

1 Model Size and Orientation

2 Type of Milling

3 Create Tool Path

4 Preview Results

5 Perform Cutting

1.3406 x 1.6250 x 0.5430 [inch]

1 Model Size and Orientation

2 Type of Milling

3 Create Tool Path

4 Preview Results

5 Perform Cutting

1.3406 x 1.6250 x 0.5430 [inch]

1 Model Size and Orientation

2 Type of Milling

3 Create Tool Path

4 Preview Results

5 Perform Cutting

1.3406 x 1.6250 x 0.5430 [inch]

1 Model Size and Orientation

2 Type of Milling

3 Create Tool Path

4 Preview Results

5 Perform Cutting

1.3406 x 1.6250 x 0.5430 [inch]

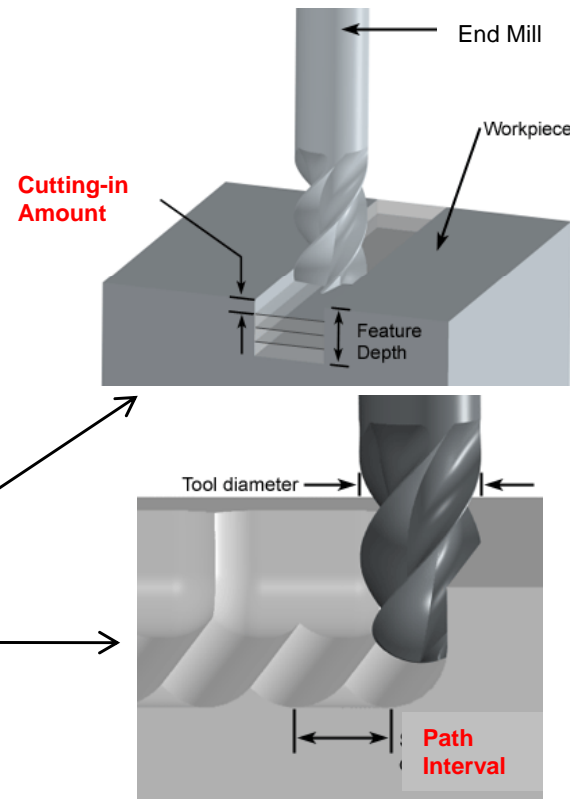
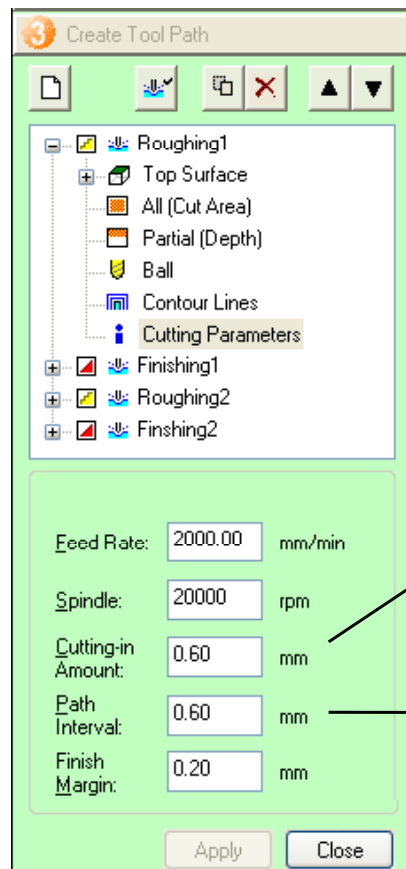
NOTES:

- You can select available Tool.
- You can modify available process to desired process if available.
- You can modify recommended feed rates if desired.
- Click on Apply when finished.
- Click on Close when all modifications have been completed.



SRP Player

❖ Step 3 Modifications



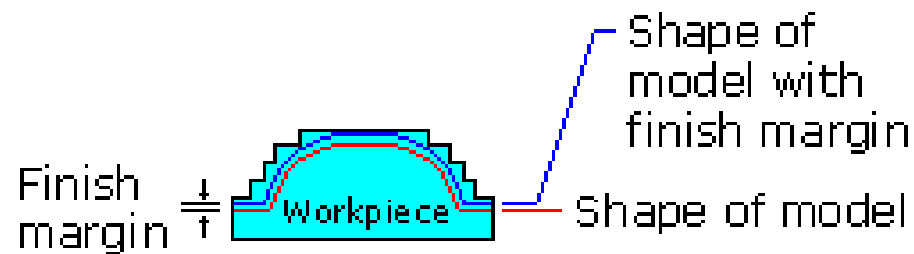
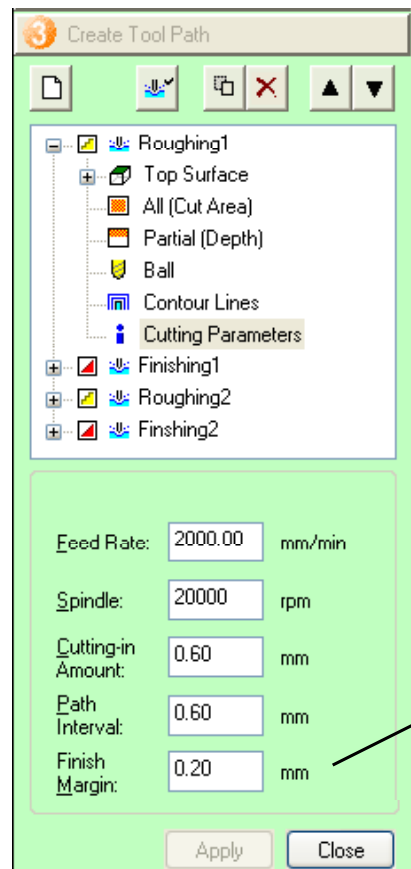
NOTES:

- Cutting parameters can be changed if desired.
- Click on Apply and Close when finished.
- Feed Rate is the speed the tool is moving.
- Spindle speed is how fast the tool is spinning.
- Cutting in amount is the depth of cut for that tool.
- The Path interval is the distance between tool passes. Finishing passes are usually much smaller than roughing passes.



SRP Player

❖ Step 3 Modifications



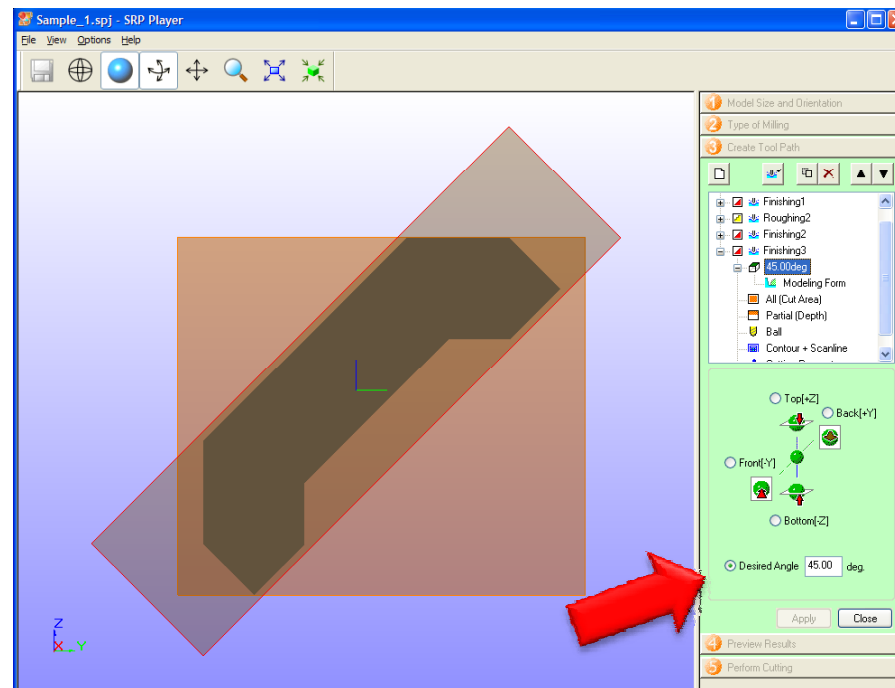
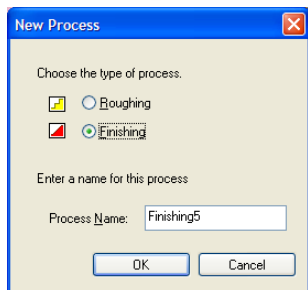
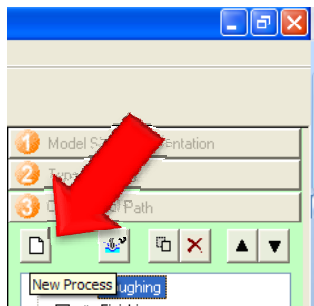
NOTES:

- Finish margin is the amount of material left on the model after that process has finished



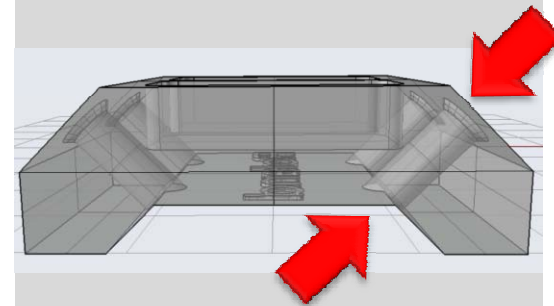
SRP Player

❖ Step 3 Advanced Modifications



NOTES:

- Let's make some advanced modifications.
- The part in questions has some holes that can't be milled from the top or the bottom.

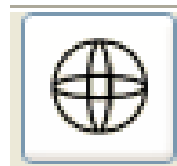


- We can turn the part at angle to mill the holes.
- We simply add a new process, usually finishing.
- Change the angle to 45 degrees and click apply to change the part.

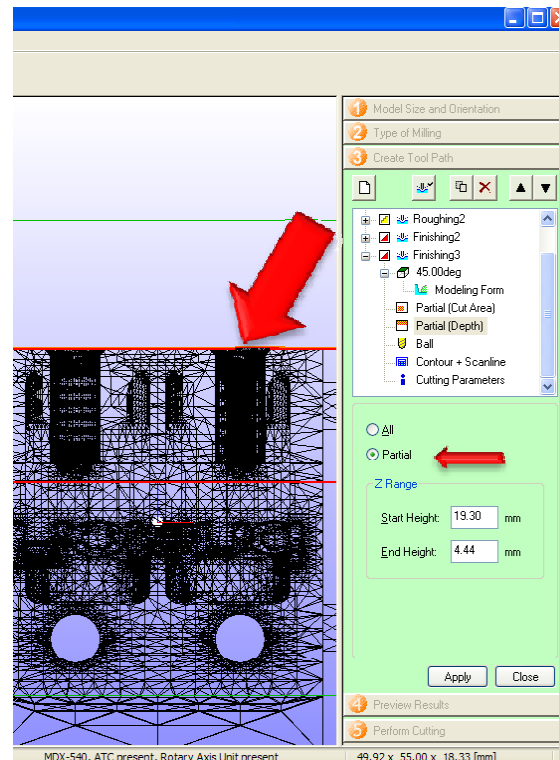
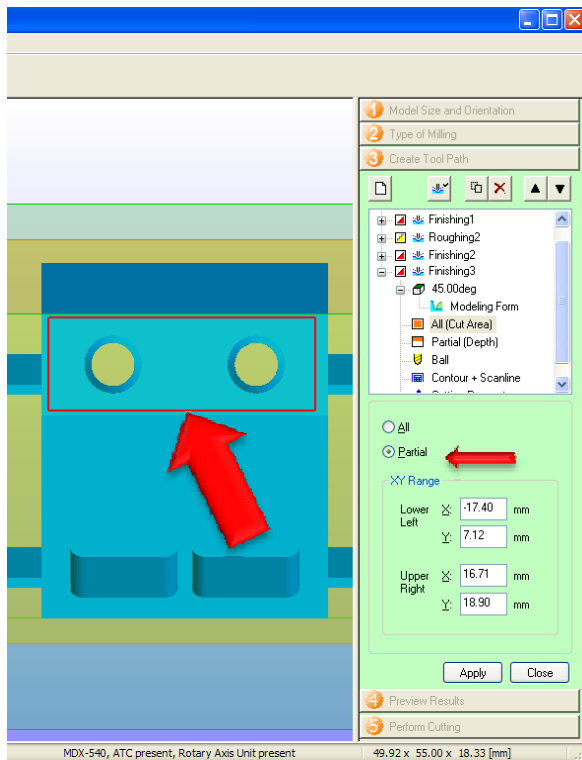


SRP Player

❖ Step 3 Advanced Modifications



Wireframe
View



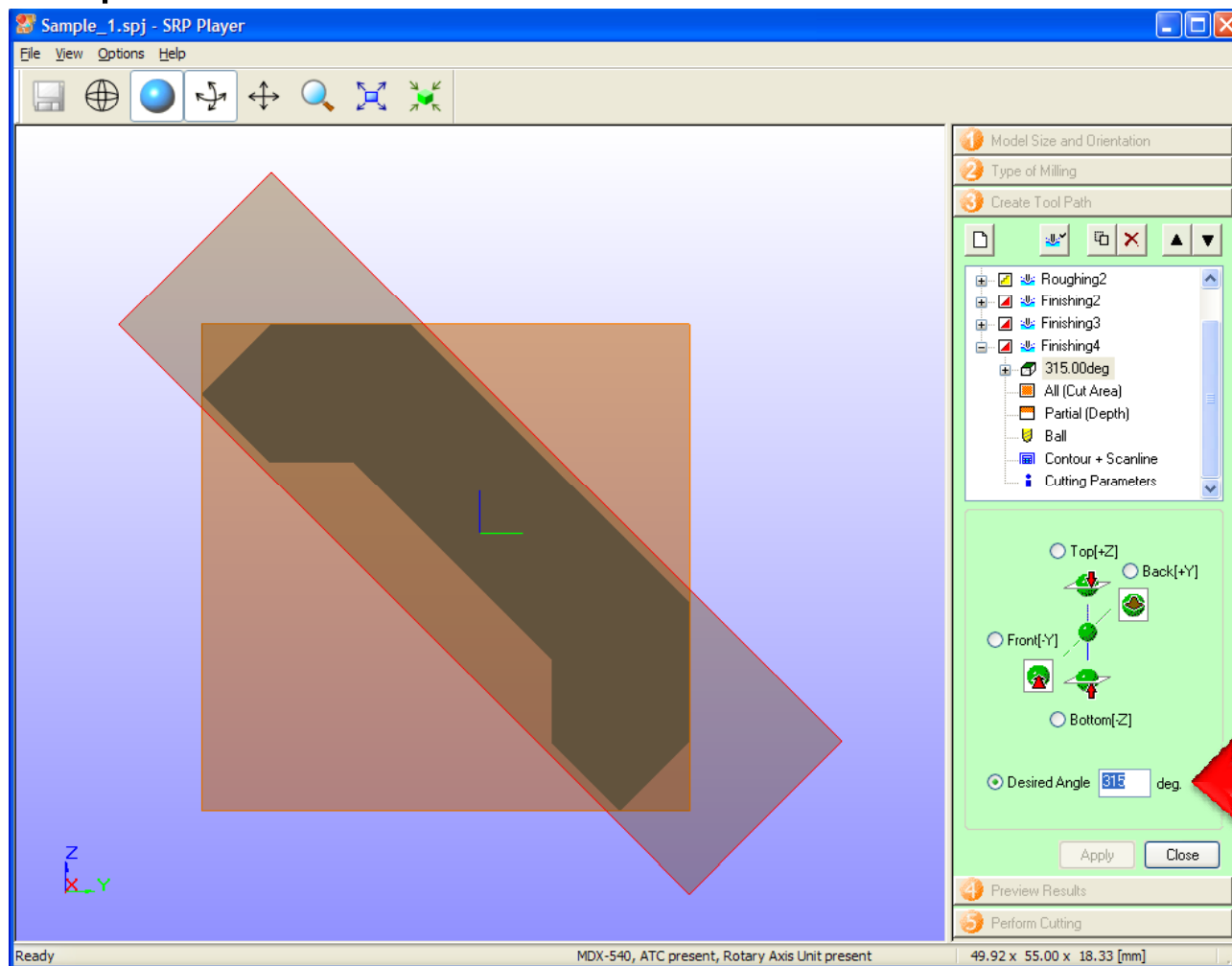
NOTES:

- As we only want to cut the holes, let's change the cutting area to cut only the holes.
- Click on Partial and simply drag the box to an area outside the tools.
- Click Apply when finished.
- For the depth, click on the start cutting line and bring it so that it is right below the depth of the hole.
- Bring the stop cutting line just below the holes so that the tool doesn't waste time cutting too deep.
- You may want to change the view to Wireframe view to view the holes better.
- Click Apply when finished.



SRP Player

❖ Step 3 Advanced Modifications



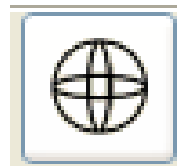
NOTES:

- To cut the other side, add another new finishing process.
- Change the angle to 315 degrees and click Apply.

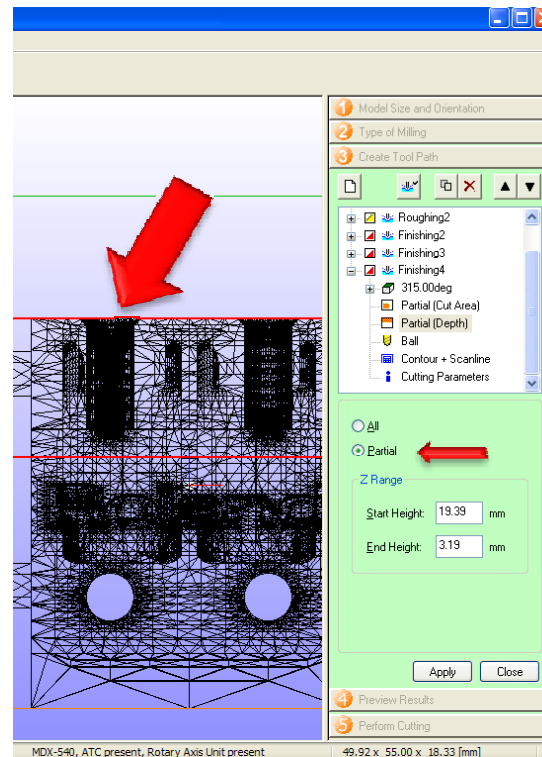
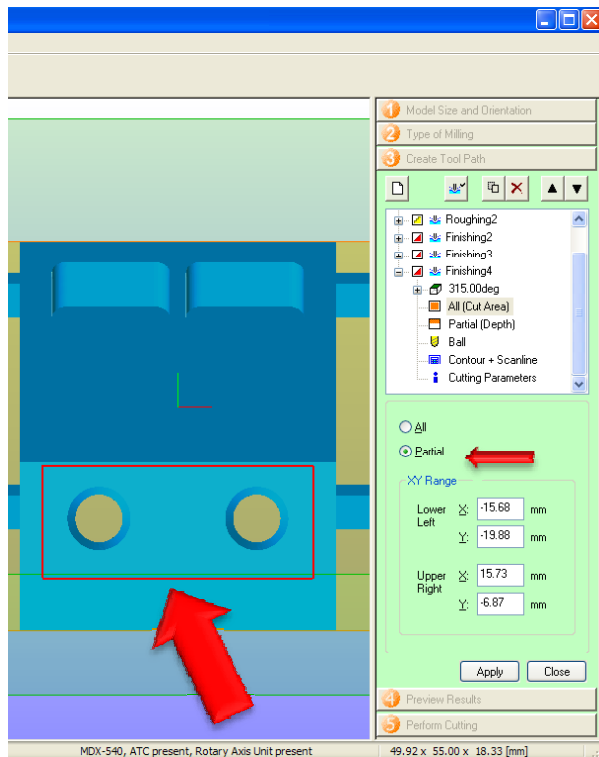


SRP Player

❖ Step 3 Advanced Modifications



Wireframe
View



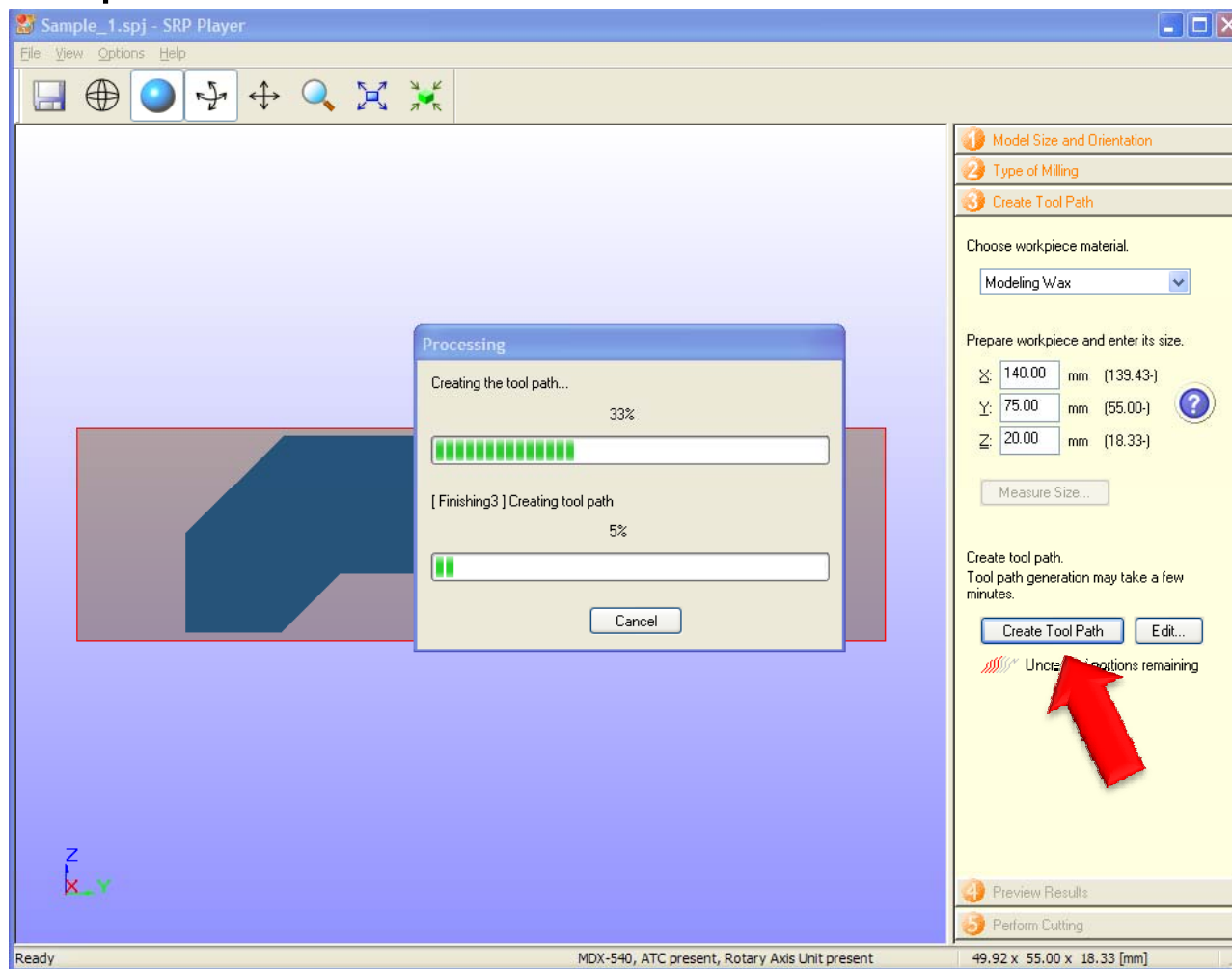
NOTES:

- Again, as we only want to cut the holes, let's change the cutting area to cut only the holes.
- Click on Partial and simply drag the box to an area outside the tools.
- Click Apply when finished.
- For the depth, click on the start cutting line and bring it so that it is right below the depth of the hole.
- Bring the stop cutting line just below the holes so that the tool doesn't waste time cutting too deep.
- You may want to change the view to Wireframe view to view the holes better.
- Click Apply when finished.
- Click Close when finished editing.



SRP Player

❖ Step 3 Advanced Modifications



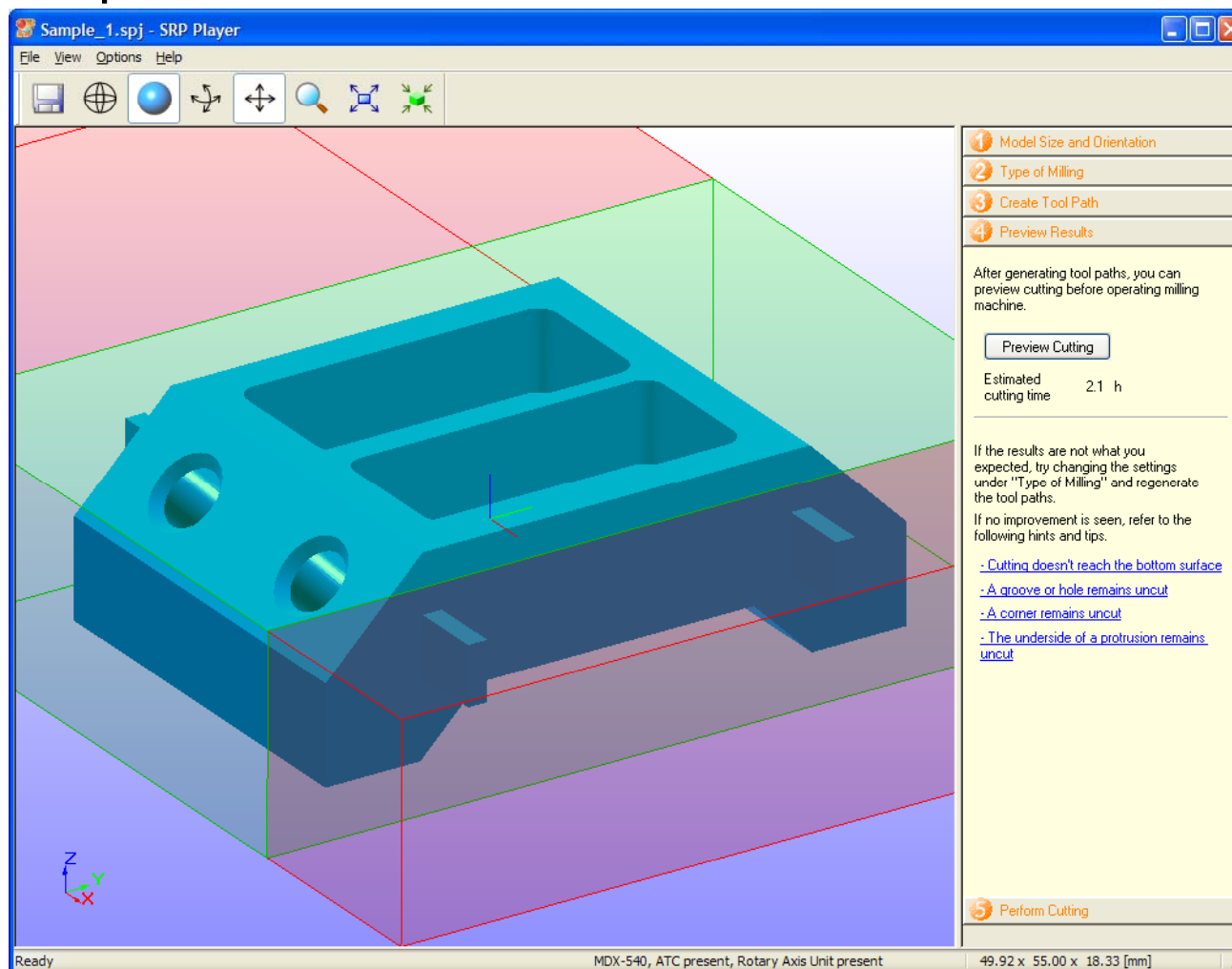
NOTES:

- Click on Create Tool Path to generate the tool path.
- Click on Step 4 when finished.



SRP Player

❖ Step 4



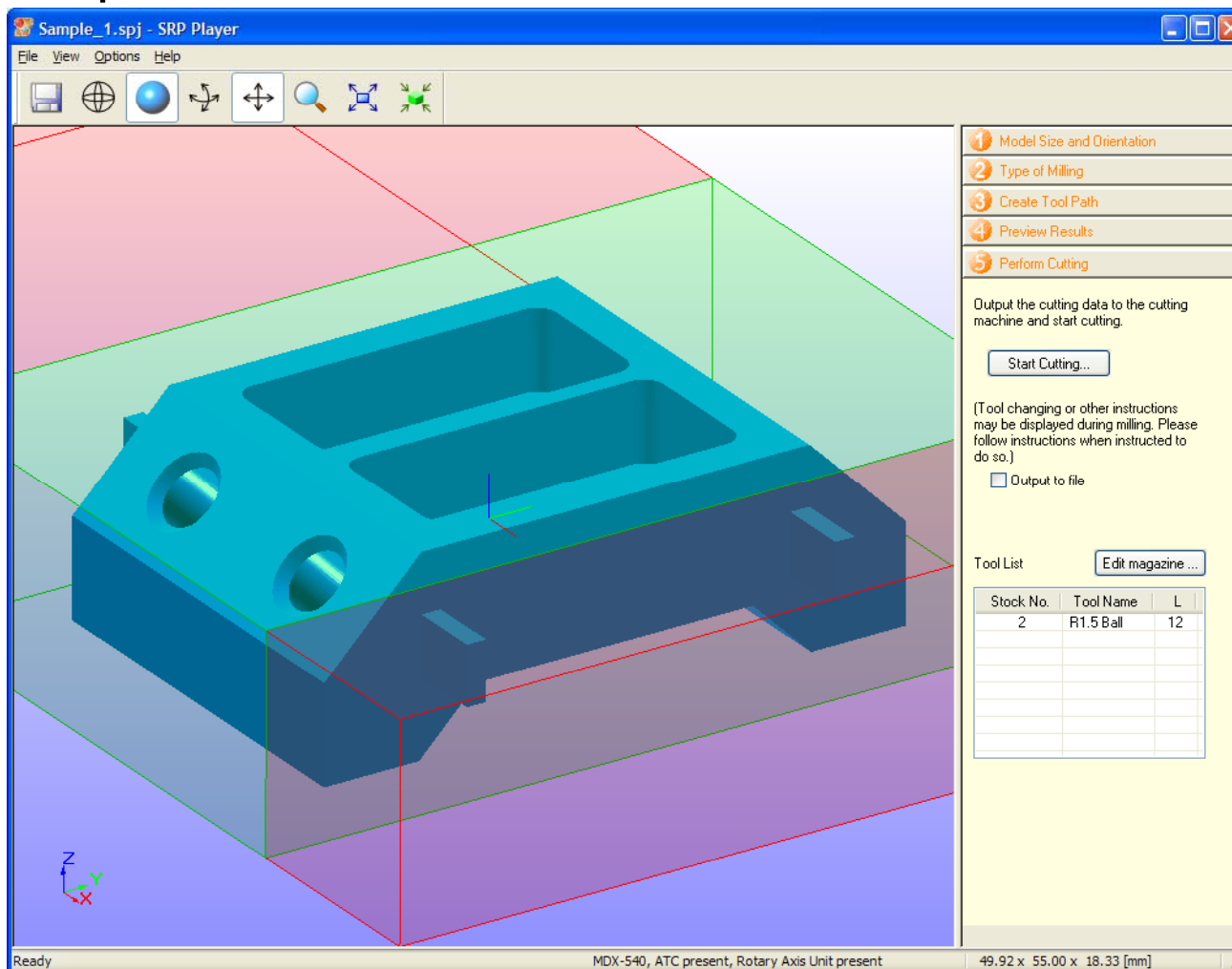
NOTES:

- You can view what the sample part will look like with selected tooling by clicking on Preview Cutting.
- You can view an estimated cutting time.
- Click on Step 5 when finished.



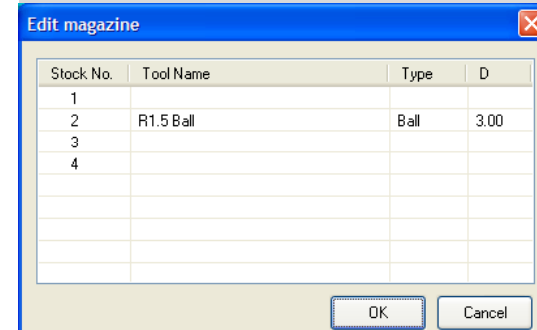
SRP Player

❖ Step 5

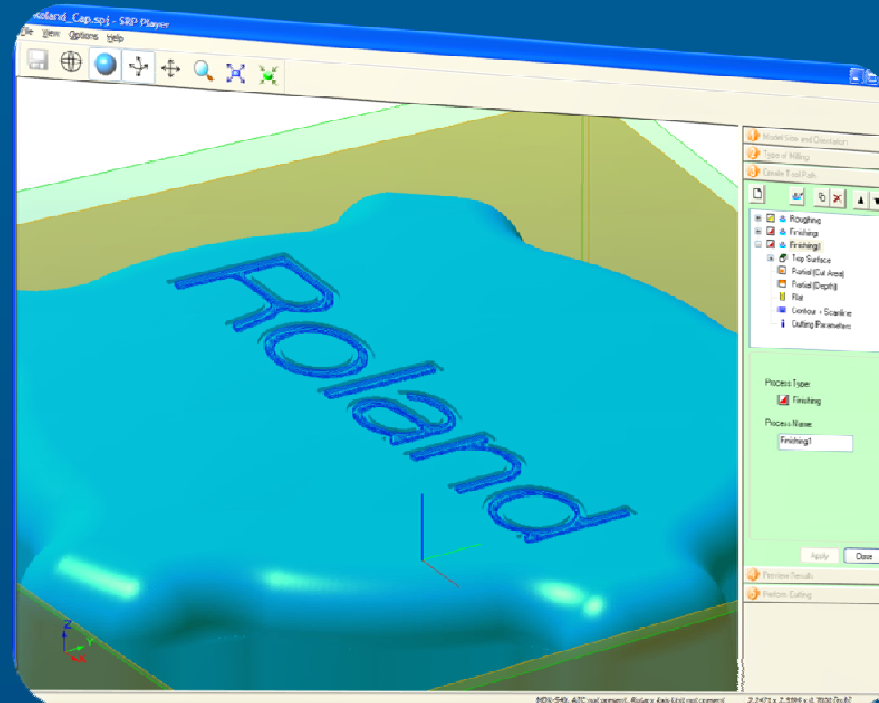


NOTES:

- If you have an Automatic Tool Changer, you can Edit Magazine to specify tool location.



- Click on Start Cutting to starting the cutting process.



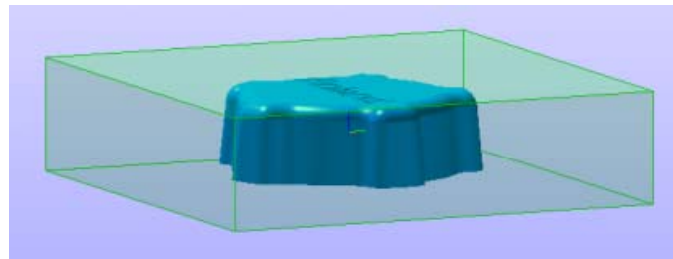
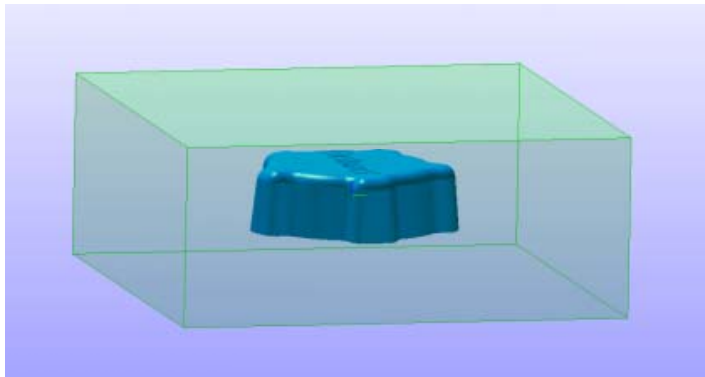
SRP Player Tips



SRP Player Tips

❖ Material Tips

- ❖ The complexity of a part, its size, and the material being cut will dictate how long it will take to cut on a machine. Here are some tips to keep in mind while setting up a part to cut on your machine.
- ❖ If your part is small, and your material thick, then this will add to the process time.
- ❖ You want to try and keep your material as close to the part size as possible.



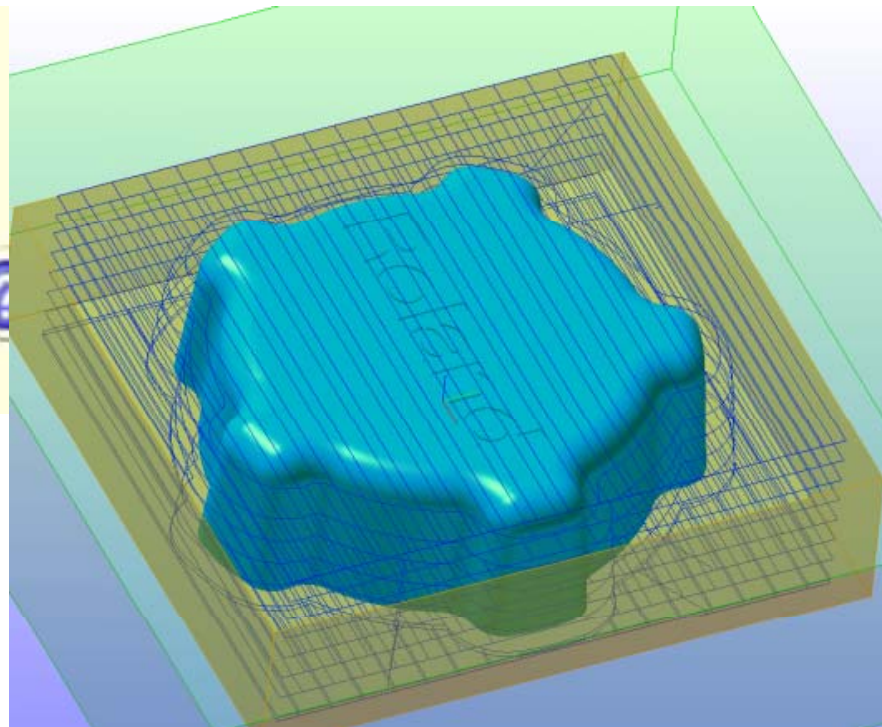
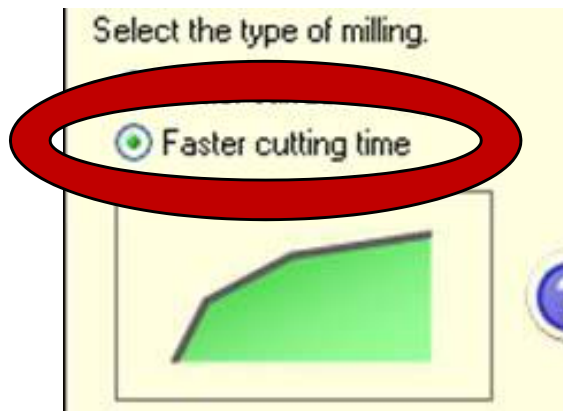
NOTES:



SRP Player Tips

❖ Cutting Speed vs. Quality

- ❖ The selection of your tool will also make a big difference in time. If you select faster cutting time...
- ❖ ...it will select the largest tool you have and cut faster



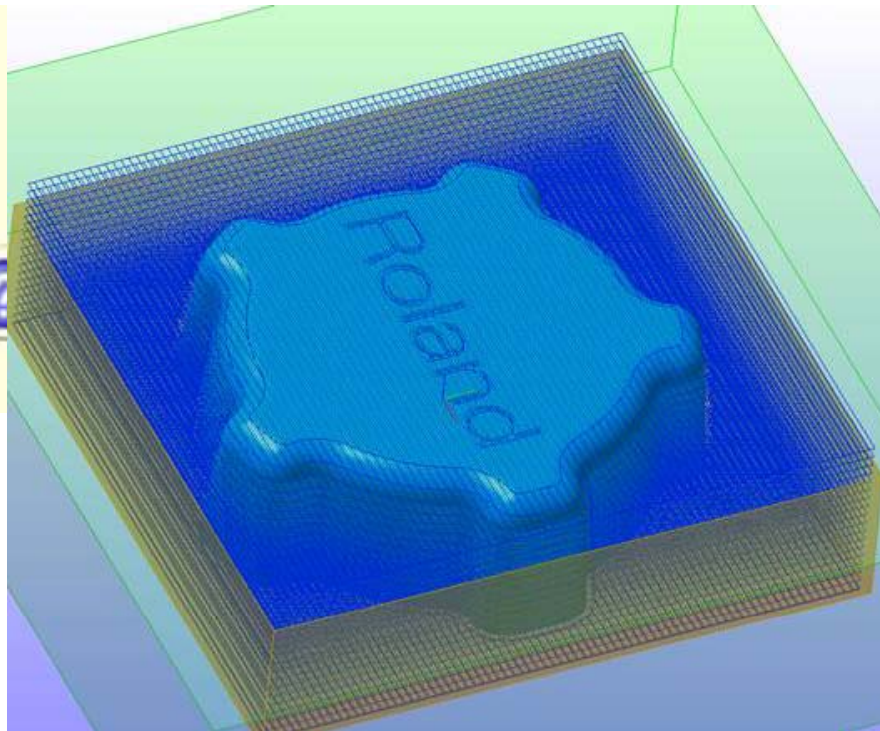
NOTES:



SRP Player Tips

❖ Cutting Speed vs. Quality Cont.

- If you select better surface finish, then it will select a much smaller tool.
- When a smaller tool is selected, it will need more passes to remove the material. All the additional lines seen in the below picture translate to longer milling times.



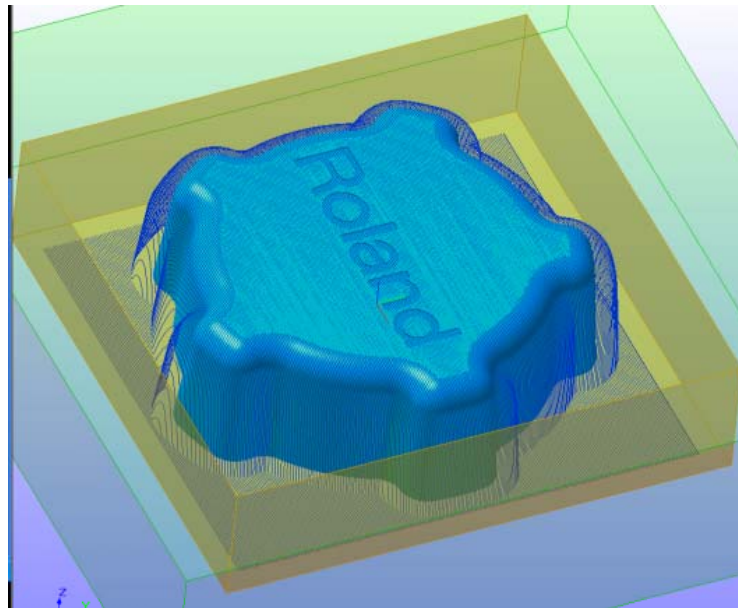
NOTES:



SRP Player Tips

❖ Cutting Speed vs. Quality Cont.

- ❖ The best thing to do is select as big a tool as you can. If you need more detail, then select a smaller tool on the finishing portion of the program.
- ❖ To speed the process up even more, change the finishing tool path to "Scan Lines" instead of "Contour Lines".



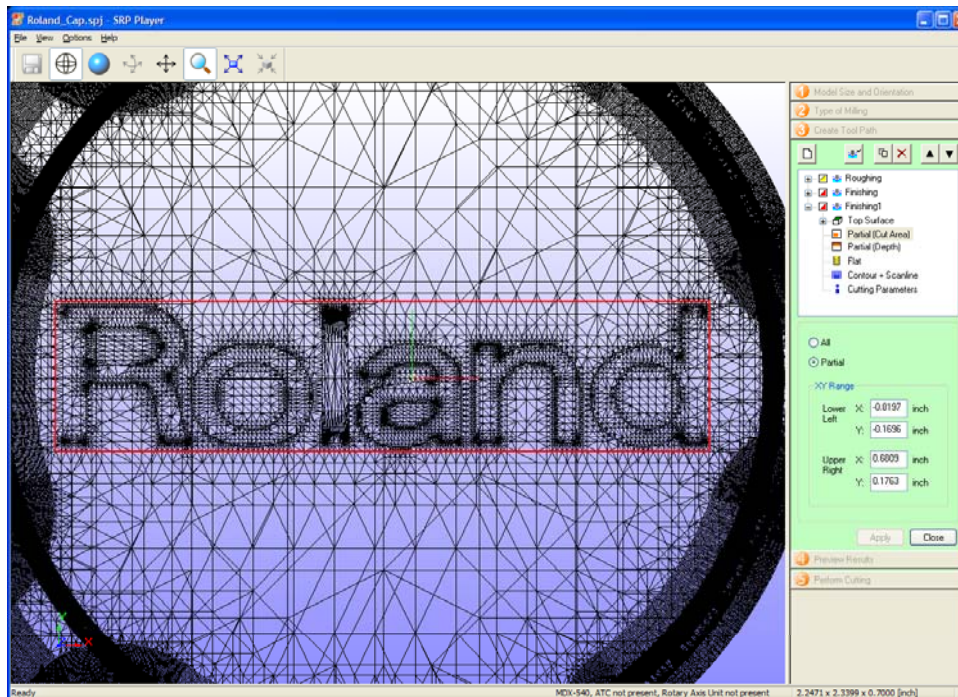
NOTES:



SRP Player Tips

❖ Small Features

- ❖ If you have small letters or small features in the part, cut the rest of the part with a larger tool and use a smaller tool just for the letters/features.
- ❖ Start by adding a finishing tool path. Set the cut area only around the letters by dragging the red box around the details.
- ❖ Next, select a tool that will fit in the letters/features.



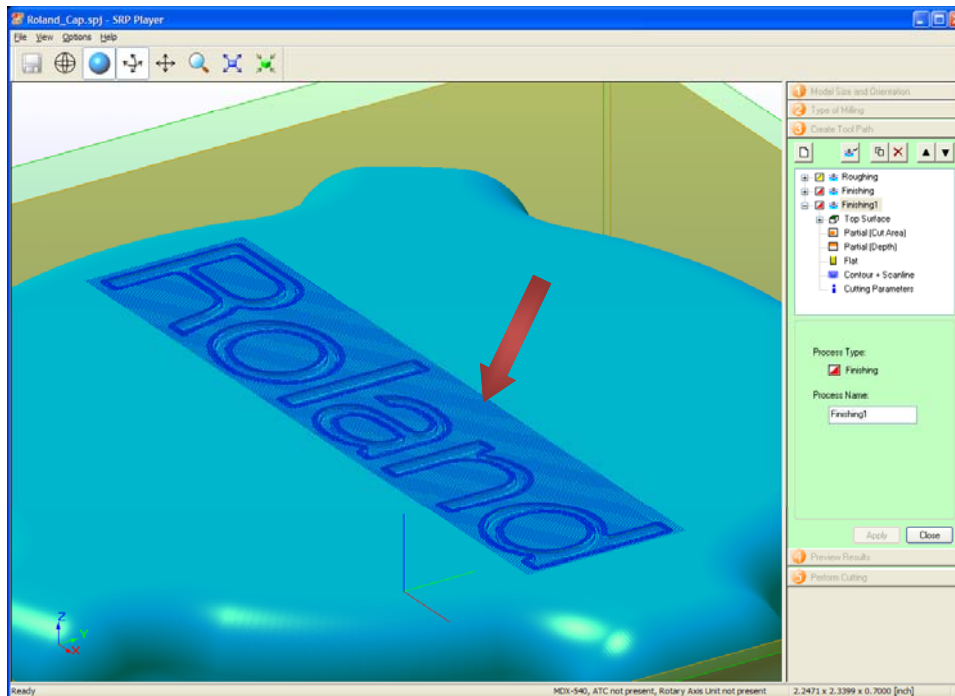
NOTES:



SRP Player Tips

❖ Small Features Cont.

- ❖ To avoid the additional surface lines shown in the below image...



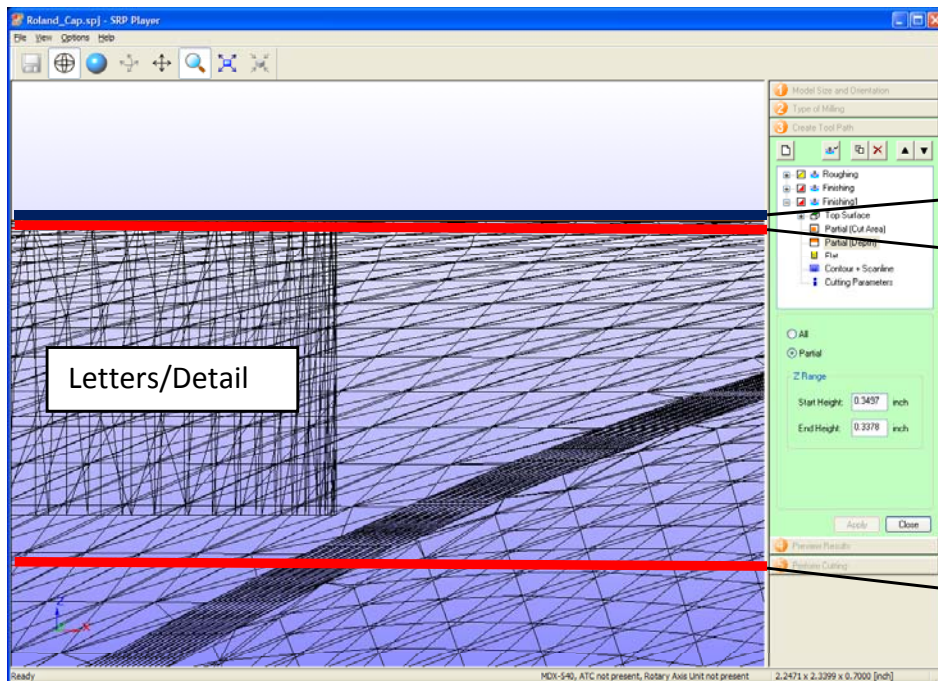
NOTES:



SRP Player Tips

❖ Small Features Cont.

- ❖ ...set the start height so that it is just below the surface of the part. Usually about 0.001" to 0.002" below the surface of the material works great.



Part Surface

Start Height

End Height

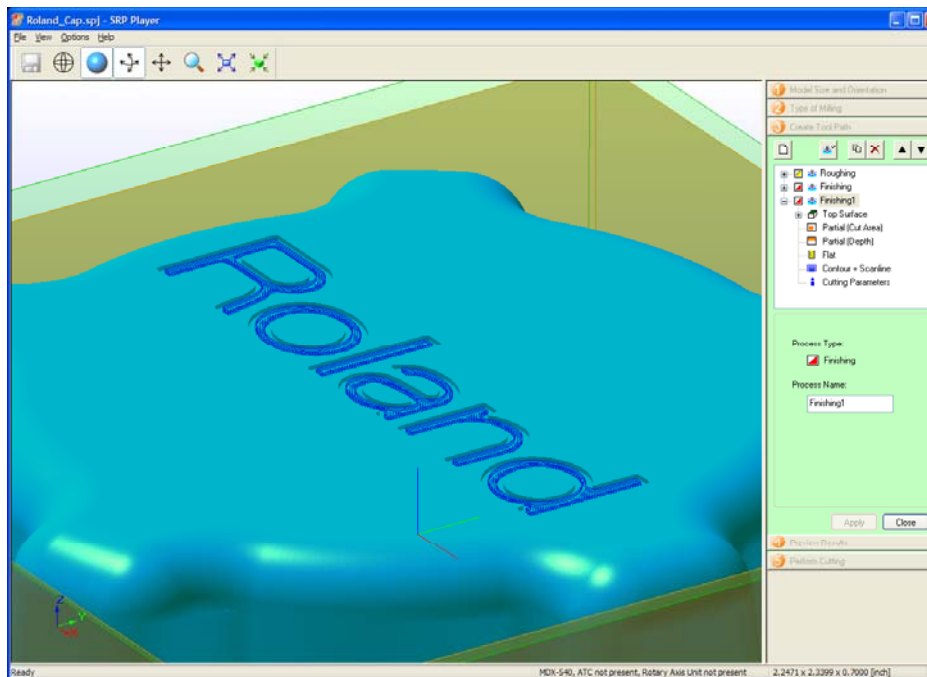
NOTES:



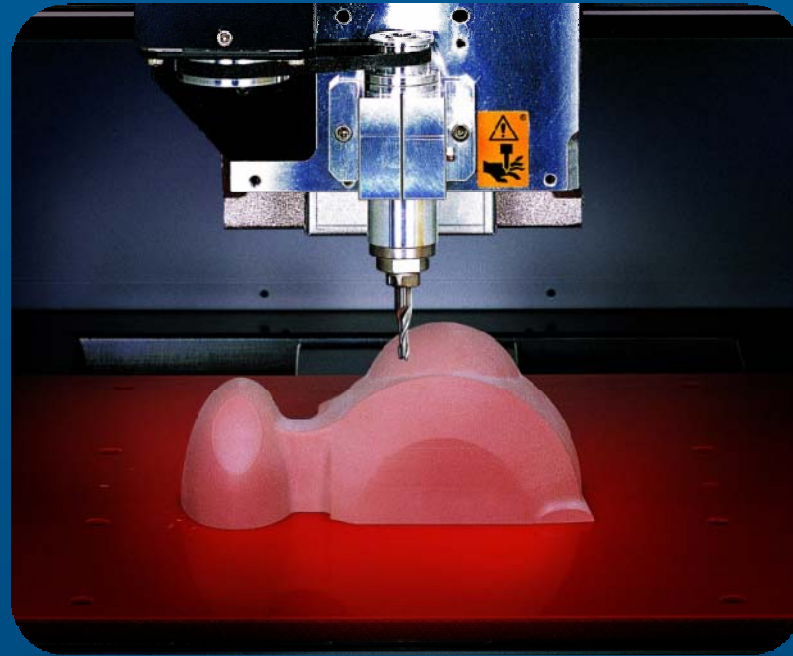
SRP Player Tips

❖ Small Features Cont.

- This will allow you to cut only the letters/details required and not waste any additional time.



NOTES:



MDX-40 Setup



What's Included

❖ All items included with MDX-40



Power cord



Collet



Sensor



Hexagonal wrench



Hexagonal screw drivers



Spanners



Roland Software Package
CD-ROM



MODELA Player4
CD-ROM



User's Manual (this document)



Roland Software Package
Installation and Setup Guide



MODELA Player 4
Installation and Setup Guide



NOTES:

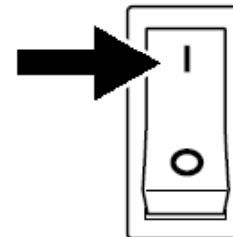
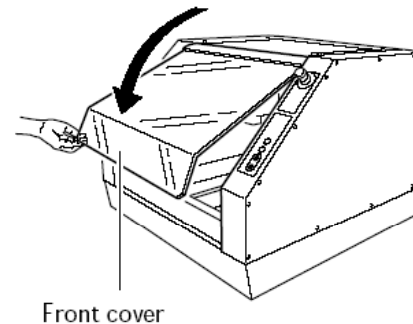
- Please be familiar with the names of all the accessories listed here.



MDX-40 Power On

❖ Turning MDX-40 on

- Close front cover.
- Turn on main power on right side of machine.
- Turn on Sub-Power to start machine.
- Press view button to remove from view (pause) mode.



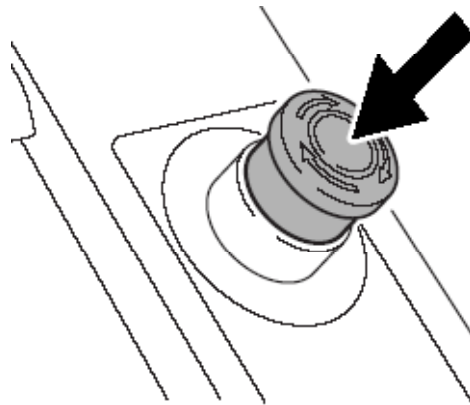
NOTES:

- Keep cover closed during operation.
- Opening cover during operation will cause an emergency stop condition.

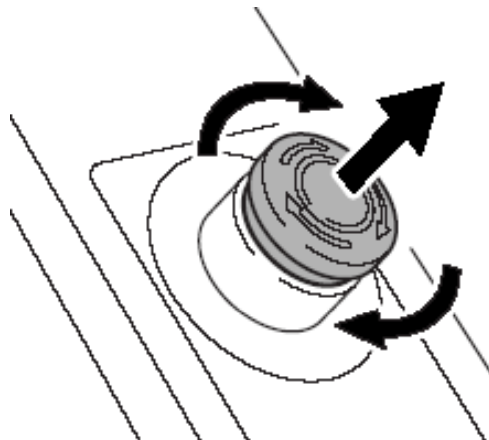


MDX-40 Safety

- ❖ Press Emergency Stop button to immediately stop cutting and abort cutting job.



- ❖ To remove machine from E-Stop condition, twist button.



NOTES:

- Machine will need to be restarted after the emergency stop condition has been removed.



MDX-40 Driver Install

❖ Driver Install

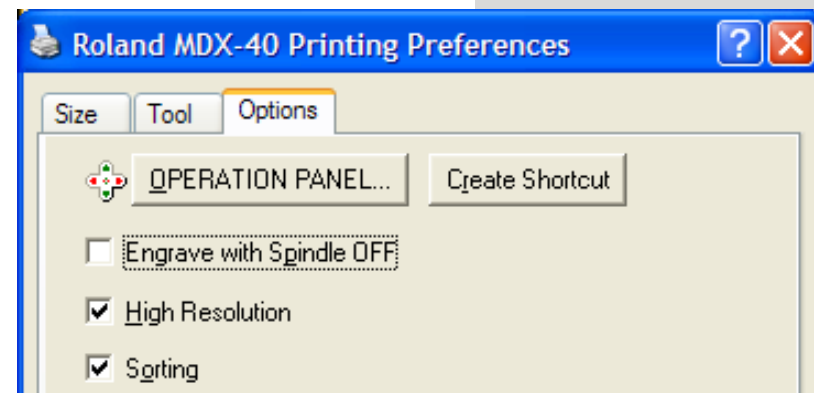
- Turn on machine
- Turn on computer
- Install USB cable
- Place Yellow drivers CD into computer
 - Labeled RSP009
- Follow windows based instructions for completing install.



NOTES:

❖ Vpanel Install:

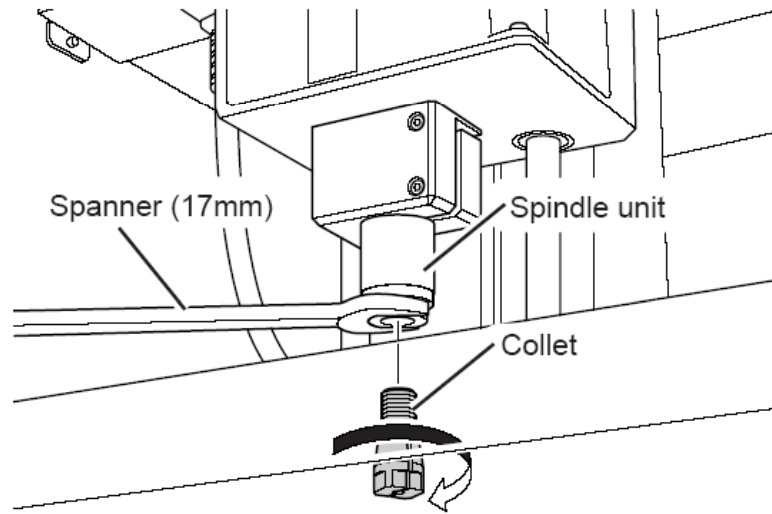
- Vpanel is installed with driver
- Go to MDX-40 Printing Preferences
 - Locating in Printers and Faxes section
- Click on 3rd option
- Click on Operation Panel to launch OR
- Click on Create Shortcut to place a shortcut on your desktop





Setup Basics – Installing Tool

- ❖ Follow the below steps for installing the collet, tooling, and using the two wrenches.
 - Install the collet loosely. Use the 17mm wrench to hold the spindle in place as you install the collet until it is finger tight.

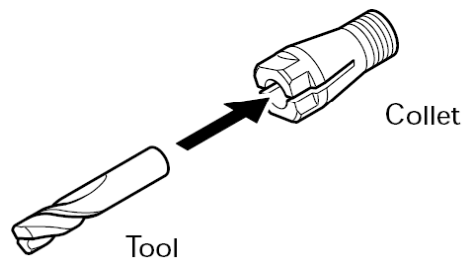


NOTES:

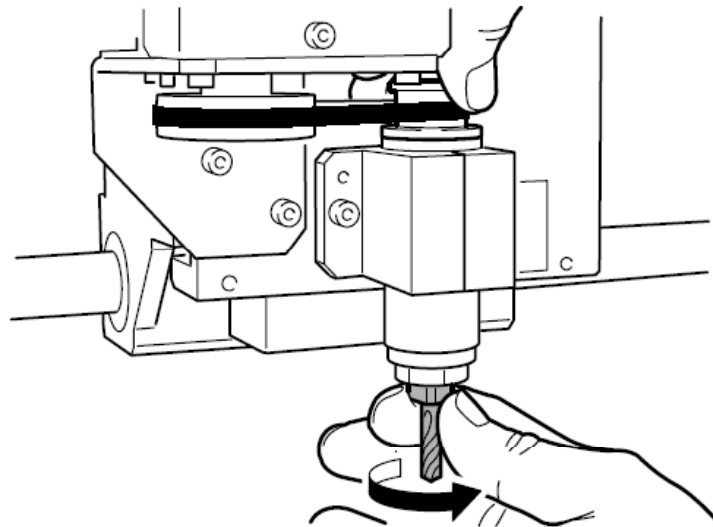


Setup Basics – Installing Tool

- Insert tool into collet.



- Twist collet to temporarily hold the tool or manually support tool.

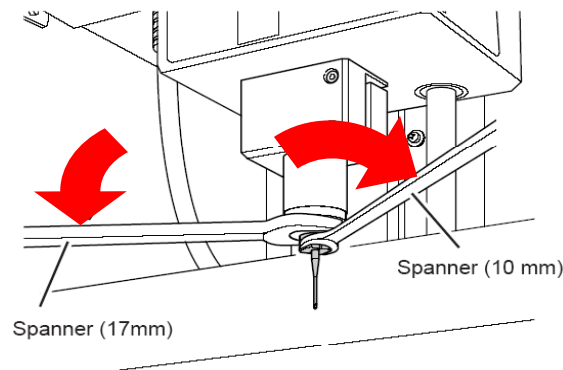


NOTES:

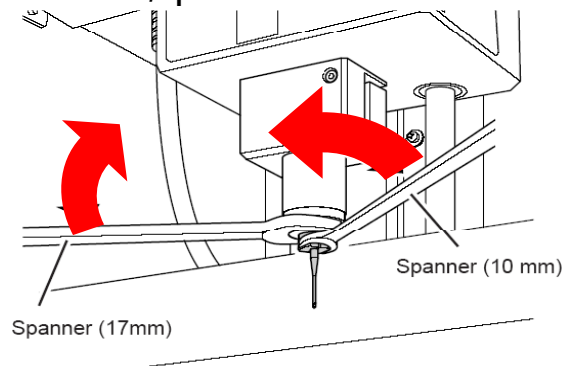


Setup Basics – Installing Tool

- To tighten the collet, use both spanners to tighten the collet.
- TIP: Use the 17mm wrench in the left hand and 10mm wrench in the right hand. Pull the wrenches away to **tighten** the collet. Tighten to about 3.2 N-m of force.



- TIP: To **loosen** the collet, again with the 17mm wrench in the left hand and 10mm in the right hand, pull the wrenches towards each other. Support tool to prevent the tool from dropping.

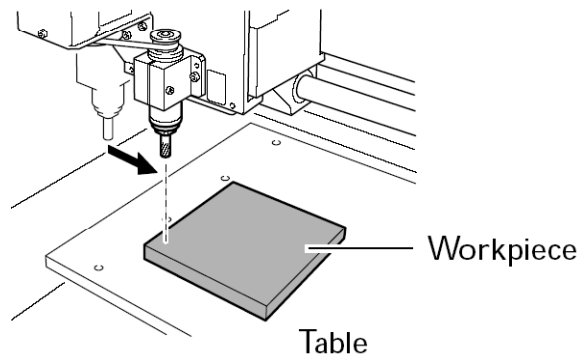


NOTES:



MDX-40 Adding Material

- ❖ Affix material to MDX-40 table using either AS-10 sheets or double sided carpet tape (heavy traffic type)



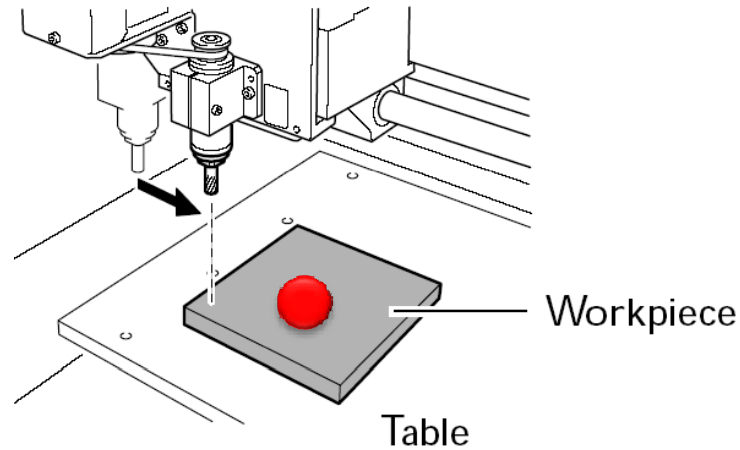
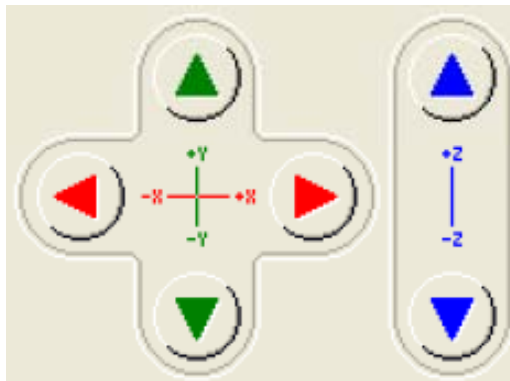
NOTES:

- Double sided carpet tape (Heavy traffic variety) can be purchased at local hardware store such as Home Depot and Ace Hardware.
- Best tape is fabric based tape not foam or fiberglass type tape as it is easily removed from the table.

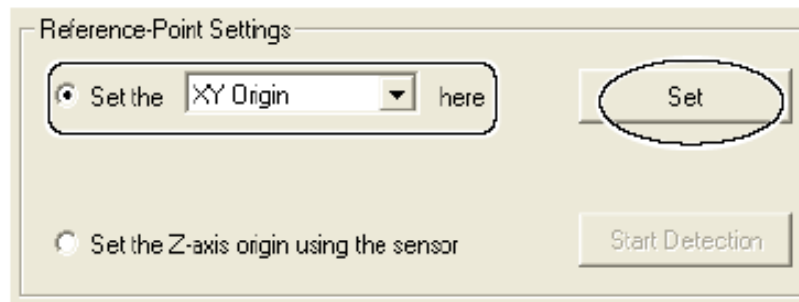


MDX-40 Setting Origin Points

- ❖ Move tool to origin point selected in software.
 - Usually the center of the material



- Set origin point at this location

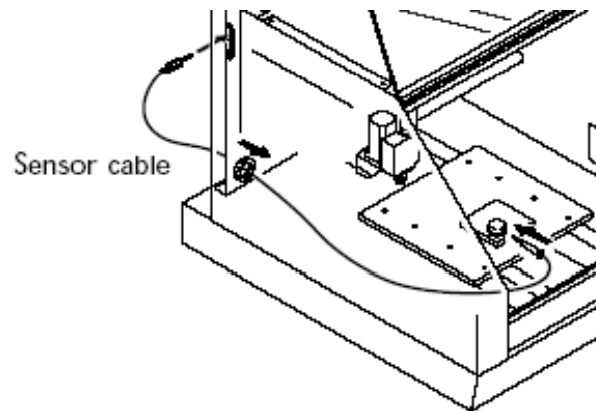


NOTES:

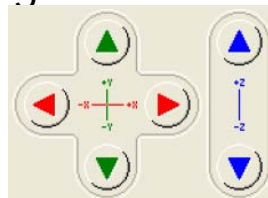


MDX-40 Setting Origin Points

- ❖ Place Z0 sensor above material and connect sensor cable to the sensor and Z0 connector on the back left side of machine.



- ❖ Move tool so that it is right above the sensor about .250".



- ❖ Click on "Set the Z-axis origin using the sensor" to set Z Origin.

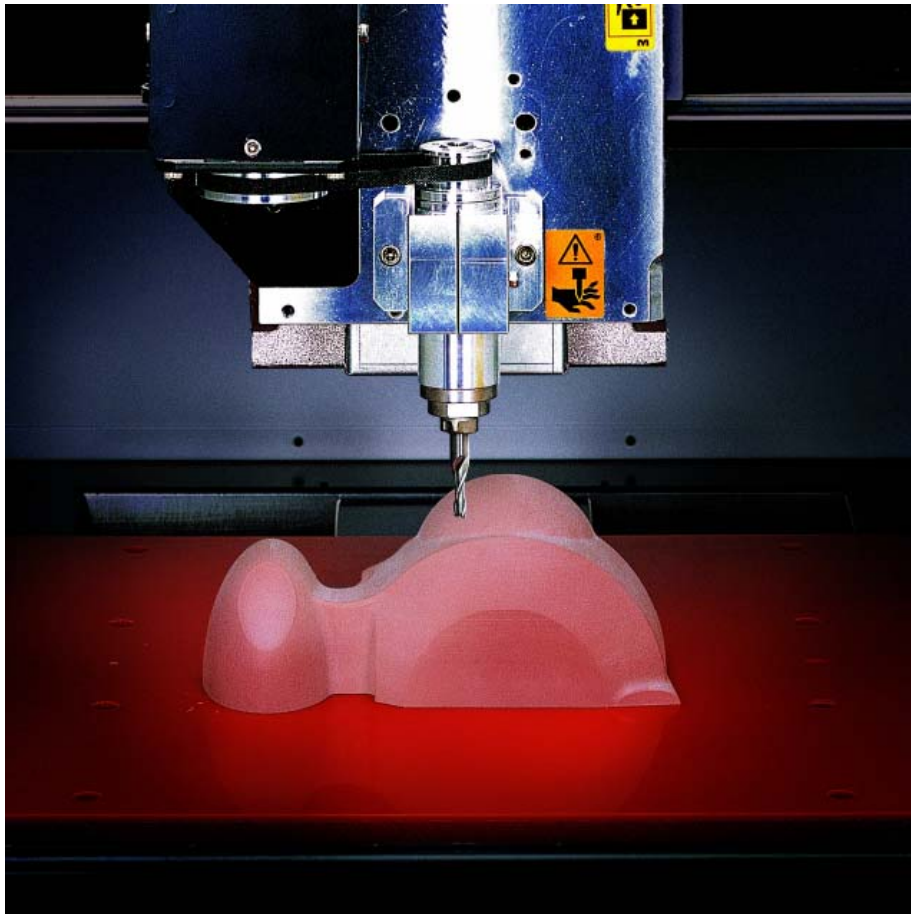


NOTES:



MDX-40

- ❖ The MDX-40 is now ready to receive commands from software program.

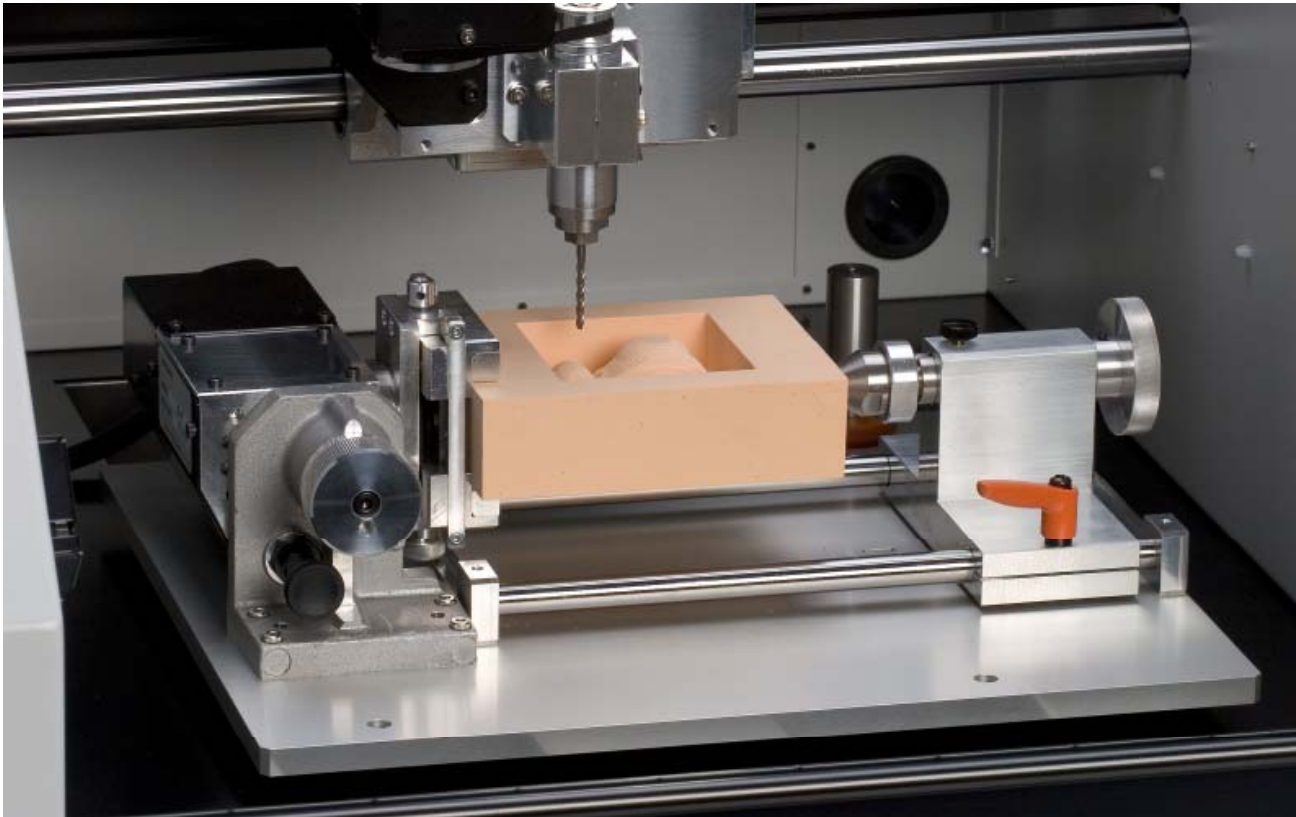


NOTES:



ZCL-40 Rotary Axis

- ❖ The ZCL-40 allows you to cut objects and rotate them automatically.
 - Slightly limited loadable material.
 - 3.3" Diameter by 5.2" Length maximum material size.

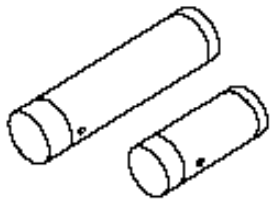


NOTES:

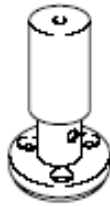


What's Included

- ❖ All items included with optional ZCL-40



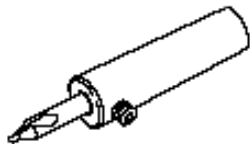
Y-origin sensors
(large and small)



Z-origin sensor



Y-origin detection pin



Center drill



Live center



Hexagonal wrench



Cap screws
(for securing Z-origin sensor)



User's manual

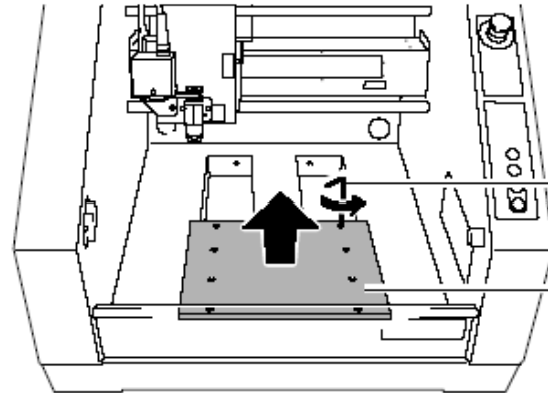
NOTES:

- Please be familiar with the names of all the accessories listed here.

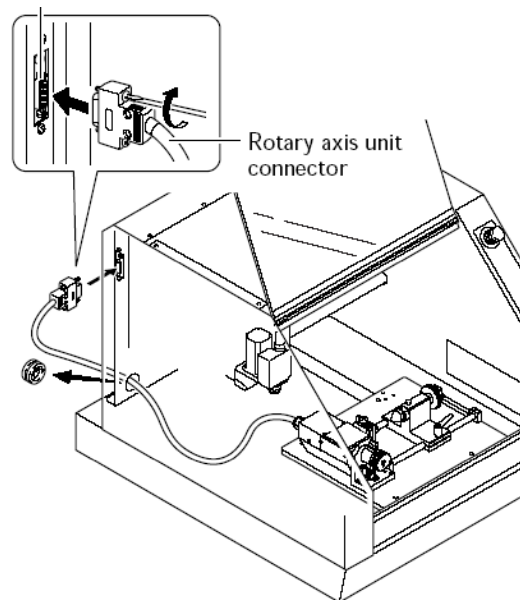


ZCL-40 Setup

- ❖ Remove 8 screws and remove table completely



- ❖ Install ZCL-40 unit and attach using same screws and connect connector to back of machine

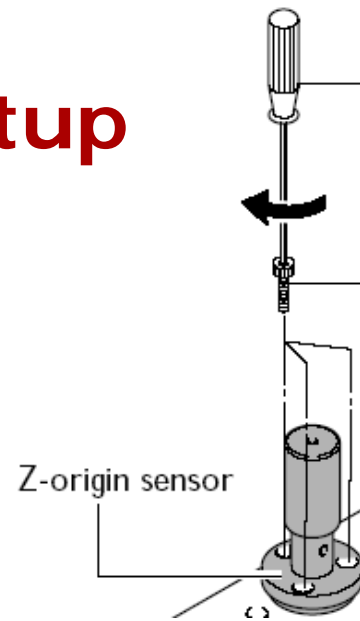


NOTES:



ZCL-40 Setup

❖ Install Z0 sensor



❖ Set A-Angle on ZCL-40 unit.

- Move clamp so that it is level and set origin.
- Set A Origin at this point.

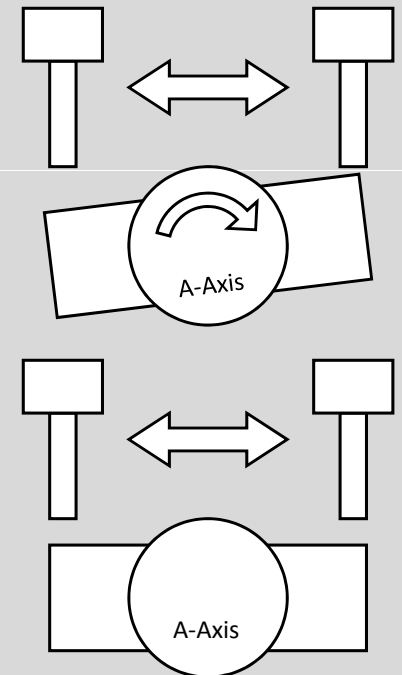


Reference-Point Settings

<input checked="" type="radio"/> Set the A Origin here	<input type="button" value="Set"/>
<input type="radio"/> Set the Z Origin at the center of rotation	<input type="button" value="Start Detection"/>
<input type="radio"/> Set the Z-axis origin using the sensor	<input type="button" value="Start Detection"/>

NOTES:

- Install material into clamp and install tool.
- Use tool and material to check for correct angle.
- Just move tool in the Y axis backwards and forwards and adjust angle accordingly until flat.

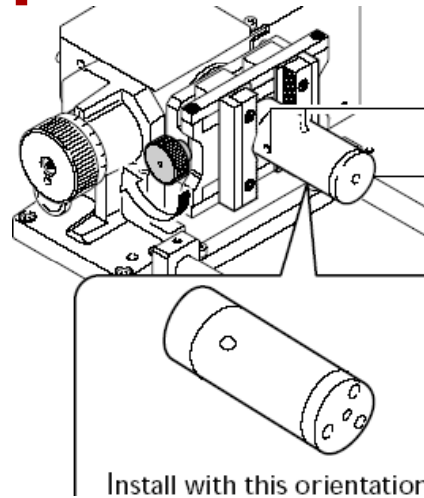




ZCL-40 Setup

❖ Setting Y Origin

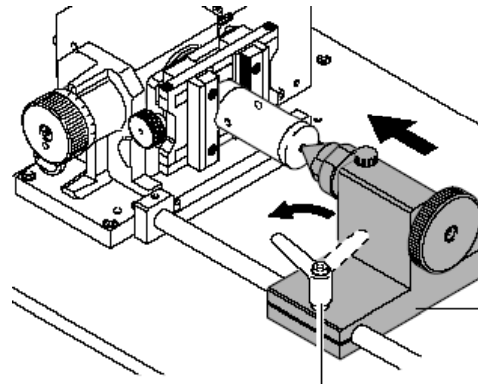
- Install Small y-origin sensor.
 - Make sure knob is facing forward and the hole as well.



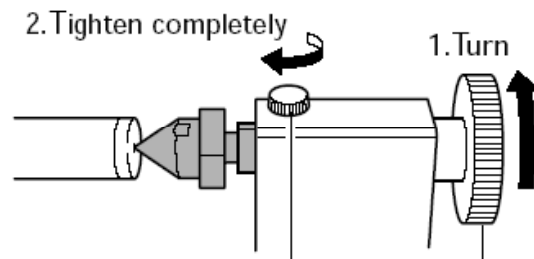
NOTES:

- Placement of knob and hole is important.

- Move in live center support and tighten lever.



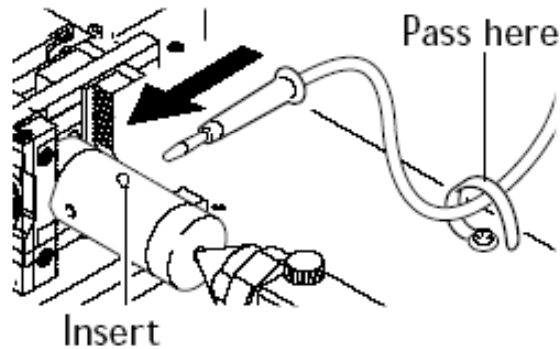
- Tighten knob to secure.



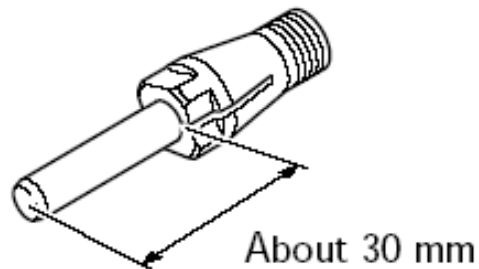


ZCL-40 Setup

- Install cable sensor cable into Y-ordin sensor.



- Install 6mm detection pin into 6mm collet.
 - Machine comes with $\frac{1}{4}$ " collet that is slightly larger than 6mm collet. Ensure you are using the correct collet.
 - Leave about 30 mm exposed.

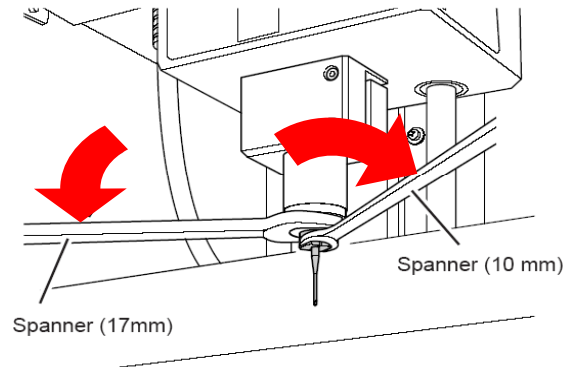


NOTES:

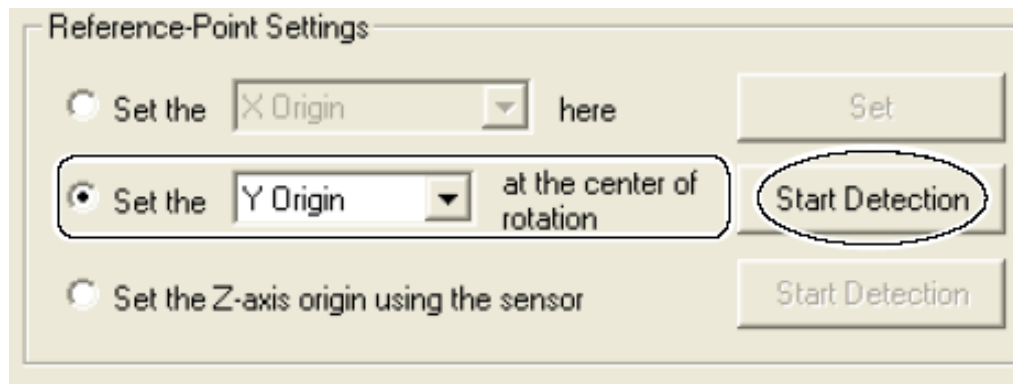


ZCL-40 Setup

- Tighten as previously mentioned.



- Start detection process by select Y-Origin process and clicking on Start Detection.
 - Machine will detect Y sensor at various locations.

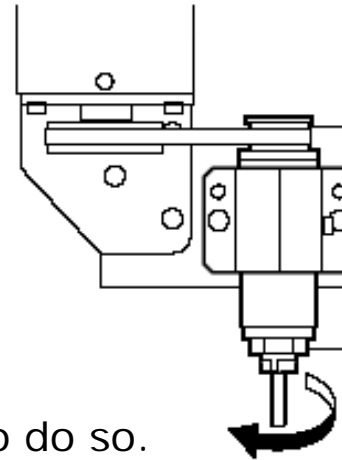
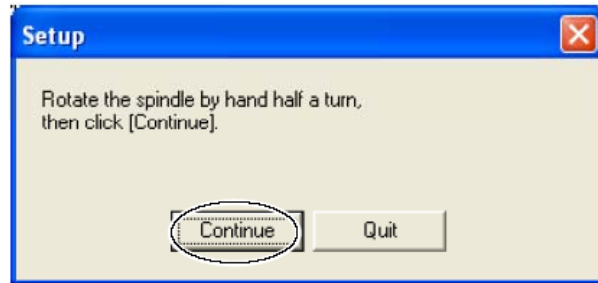


NOTES:

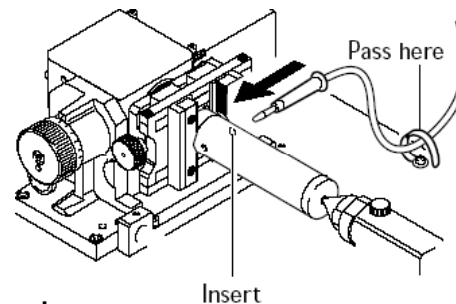
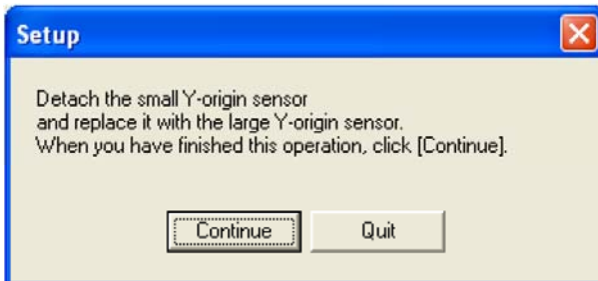


ZCL-40 Setup

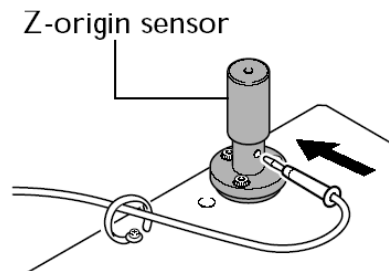
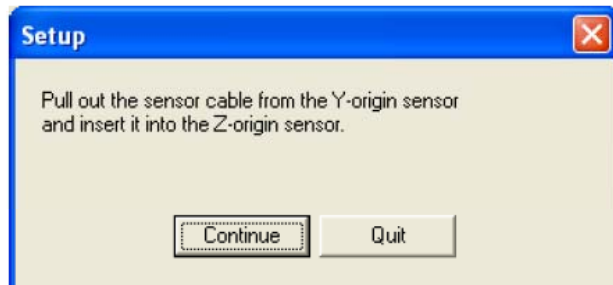
- Rotate detection pin when instructed.



- Replace large sensor when instructed to do so.



- Move sensor cable when instructed.



- Remove Y sensors and detection pin when finished.

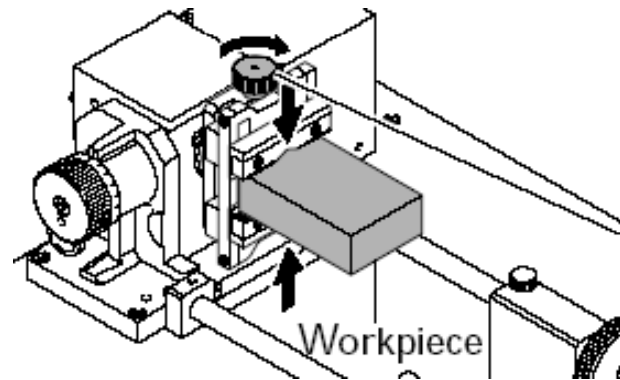
NOTES:

- Leave Z-Origin sensor installed.

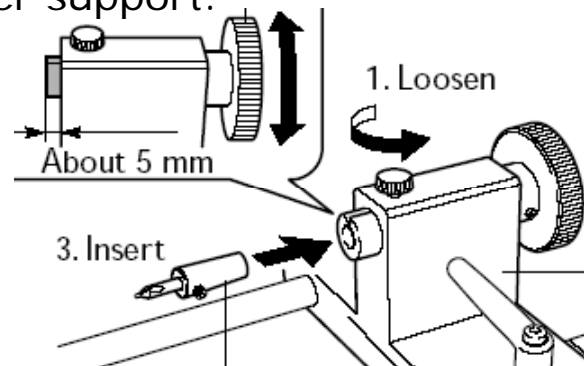


ZCL-40 Material Setup

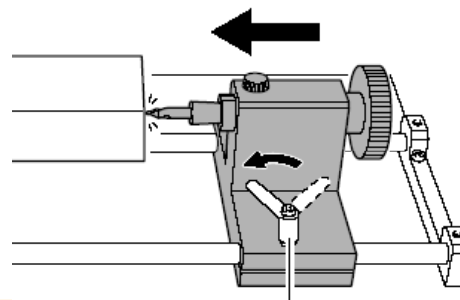
- Install material into clamp.



- Install center drill into live center support.



- Slide support so that live center touches material.



NOTES:

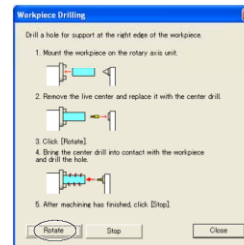


ZCL-40 Material Setup

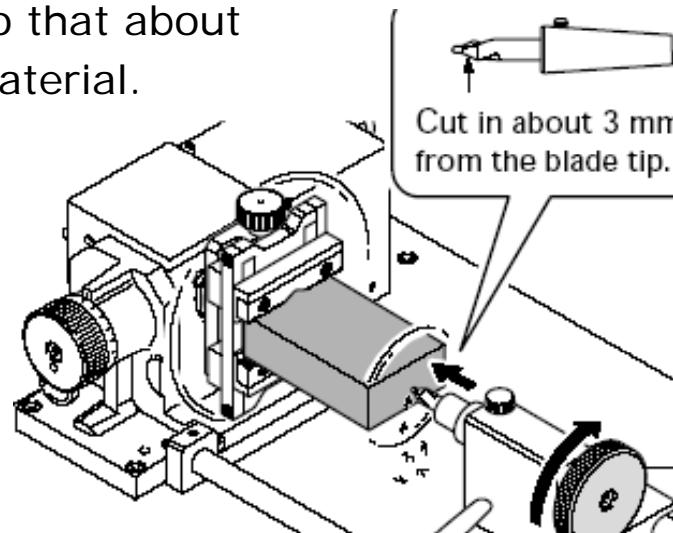
- Click on Workpiece Drilling.



- Click on Rotate to start drilling.



- Slowly turn support knob so that about 3mm of the drill is in the material.



- Click on Stop then Close when finished.

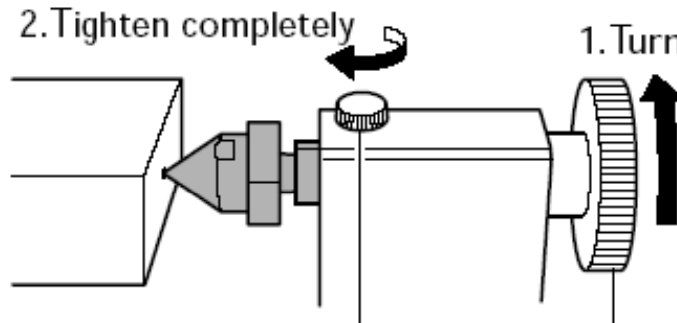


NOTES:



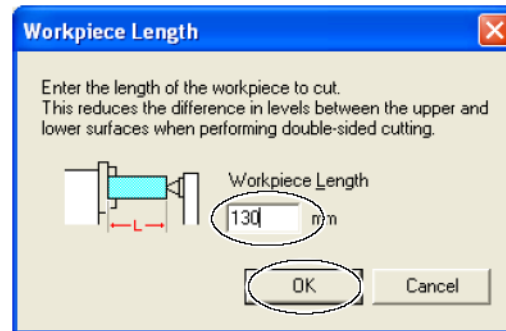
ZCL-40 Material Setup

- Replace drill with support and tighten live center.



NOTES:

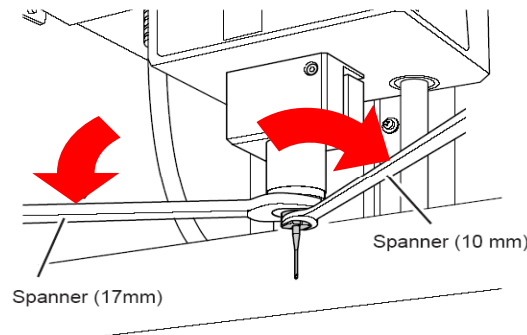
- Click on Workpiece Length and enter the length of material to be used.





ZCL-40 Origin Setting

- ❖ Install tool to be used.



- ❖ When setting origins on the ZCL-40, you only will be setting the X and Z origin. The Y origin was set during Y sensor detection.
 - First set Z Origin at center of rotation. **Use only this option when ZCL-40 is installed.**

Reference-Point Settings

☐ Set the X Origin here

☒ Set the Z Origin at the center of rotation

☐ Set the Z-axis origin using the sensor

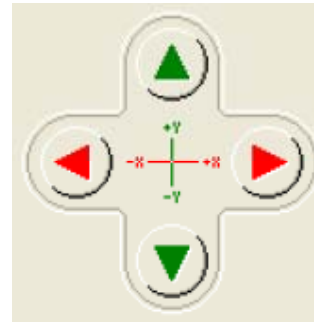
NOTES:

- Every time a tool is replaced, this procedure needs to be performed.
- If you change a tool, the machine won't know that the tool length has changed unless this step is performed.



ZCL-40 Origin Setting

- Set X origin
 - Your software will indicate where to locate the X origin.
 - It will either be located in the center or end of the part.
 - Move tool to appropriate location.



- Set X origin **only** by clicking on Set X origin here.

Reference-Point Settings

☒ Set the **X Origin** here

☐ Set the **Y Origin** at the center of rotation

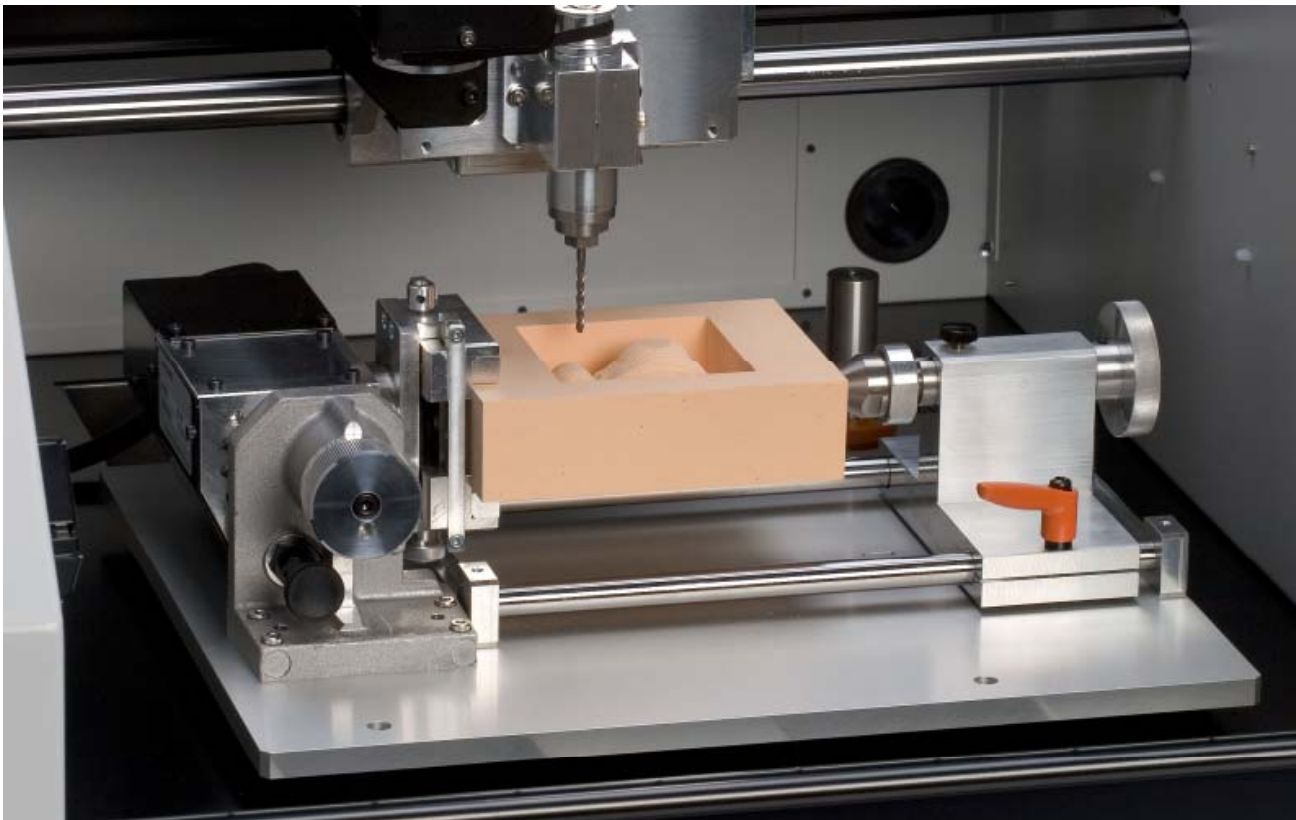
☐ Set the Z-axis origin using the sensor

NOTES:



ZCL-40

- ❖ The MDX-40 & ZCL-40 are now ready to receive commands from software program.



NOTES:



MDX-40 & JWX-10 Maintenance



Maintenance

❖ Recommended Maintenance Items

- Daily
 - Remove chips and dust
- 1,000 hours
 - Lubricate guide rails (21675102)
- 2,000 hours
 - Spindle & Spindle Belt (ZS-40)

❖ Hour firmware check

- Alt + click Close on vpanel
- Spindle time is in seconds
- $(\text{spindle time})/3600 = \text{hours}$
- Firmware versions listed

A screenshot of the Roland JWX-10 Panel interface. The title bar reads "Roland JWX-10 Panel". The interface is divided into several sections. The top section has three columns: "USB ID", "Length", and "Origin3". Under "USB ID", there is a dropdown menu showing "001". Under "Length", there are three rows: "X" with a value of "0", "Y" with a value of "0", and "Z" with a value of "0". Under "Origin3", there are three rows: "X" with a value of "326", "Y" with a value of "105", and "Z" with a value of "-1005". The bottom section is labeled "Firmware" and has two rows: "V" with a value of "V120" and "B" with a value of "B130".

USB ID	Length	Origin3
001	X 0	X 326
	Y 0	Y 105
	Z 0	Z -1005

Firmware
V V120
B B130

NOTES:



Maintenance

❖ Daily Cleaning

- Use inexpensive paint brush
- Wipe away visible chips & dust
- Vacuum away all remaining chips
 - Wet dry vac works great



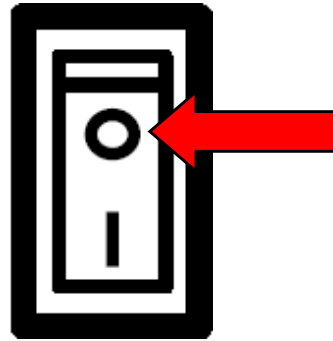
NOTES:



Maintenance

❖ Lubricate guide rails

- Turn off main power to the machine.



- Clean guide rails using a clean lint free rag.

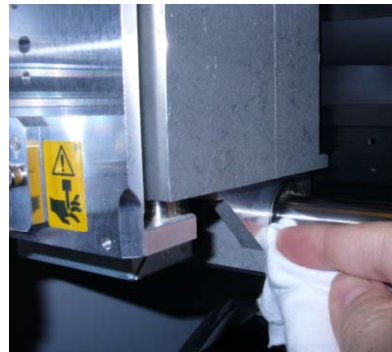


NOTES:



Maintenance

- Clean outside of bushings using clean lint free rag.



- Place small amount of grease (Part # 21675102) on finger and spread a **light** coating on the guide rails.

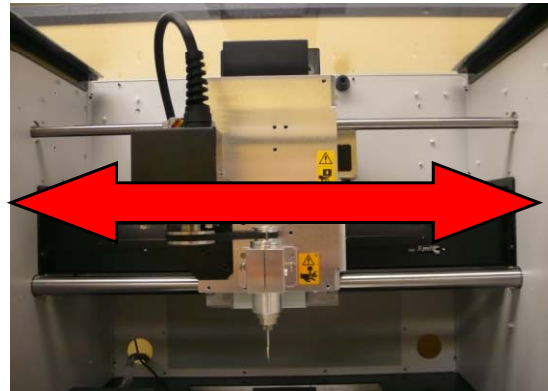


NOTES:



Maintenance

- Move carriage back and forth across the guide rails a few times.



- Clean guide rails and remove excess grease using lint free rag.



NOTES:



Maintenance

- Reapply a small amount of grease on finger and spread a **light** coating on the guide rails.



- Repeat for other Axis.

NOTES:



MDX-40 Resources



Resources

❖ **Plastics**

- Plastics supplier, various US locations
- www.professionalplastics.com



❖ **Special Tooling**

- Long reach tooling
- EXOCARB series by OSG
- www.mscdirect.com



❖ **Tooling Board**

- Renshape tooling board
- Vacuum form board, prototypes, models
- www.freemansupply.com



NOTES:



Resources

❖ Benches

- Sturdy benches for machines in various sizes
- K-series heavy duty benches
- Different countertops, wood, stainless, formica, etc.
- www.benchdepot.com



NOTES:

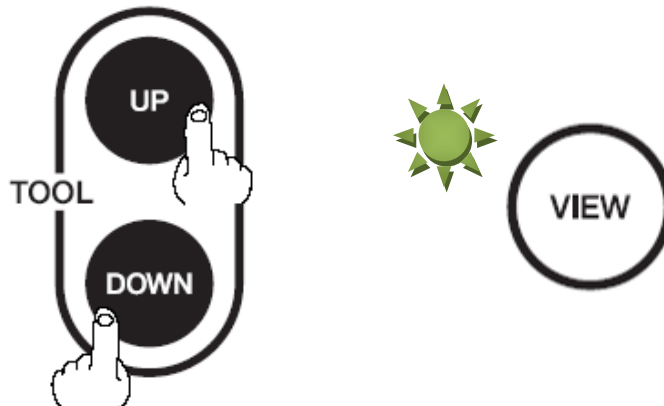
Model: Roland MDX-15/20, MDX-40, & JWX-10
Subject: Delete or Cancel Job Sent to Machine
Author: PG

The following document covers deleting or canceling a job that has been already sent to the machine. The procedure is the same for the MDX-15/20 & 40, JWX-10 and covers clearing the machine and computer.

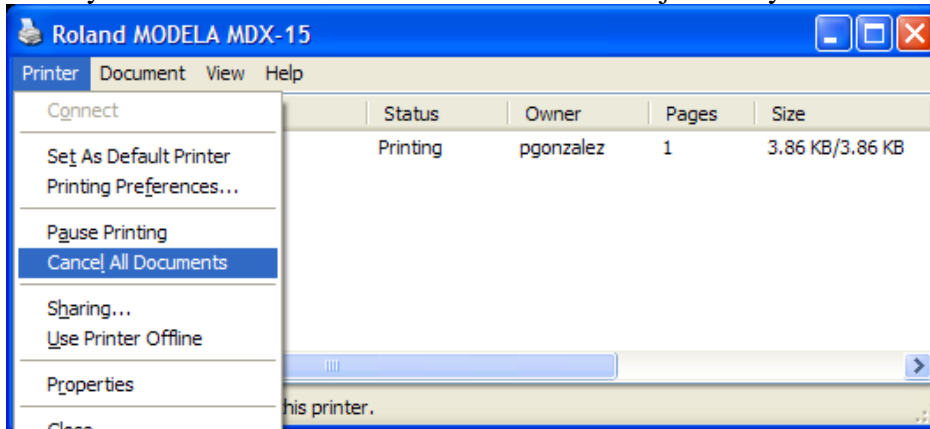
1. Press the view button and wait until the view light stops flashing. It will stop flashing when the machine is in view mode and not moving.



2. Press "tool up" and "tool down" at the same time. The view light will begin to flash indicating it is dumping or removing the program.



3. Go to your Printers and Faxes folder and delete all jobs for your machine.



Model: Roland MDX-15/20, MDX-40, & JWX-10

Subject: Delete or Cancel Job Sent to Machine

Author: PG

-
4. When the view light stops flashing, the buffer is clear. (This may take a few minutes on the MDX-15/20)



5. Press the view light again to bring it back to the origin point.



6. The machine is now ready for the next job.