



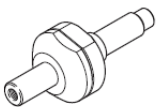

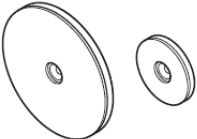
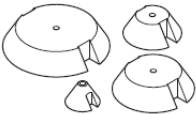
Engraving a Pewter Tankard (Cylindrical Metal Objects)




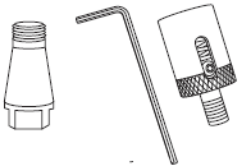




Cylindrical Engraving of Metal Objects

❖ Tools required for Cylindrical Engraving

Jigs			
			
Free-end spigot	Cup-cone spigot	Face plates (included items)	Cup cones (included items)
Cylindrical-engraving adapter (included items)			

Cutting Tools		
Material and engraving method used	Suitable cutter types	Other necessary cutting tools
Scribing metal material (aluminum, brass, or stainless steel)	Diamond scraper (diameter 4.36 mm, included item; ZDC-A4000) *1 	Solid collet for diamond scraper (φ 4.36 mm, included item) *2 
	Diamond scraper (diameter 3.175 mm, optionally available; ZDC-A2000) *3 	Solid collet (diameter 3.175 mm, included item) Burnishing Attachment (optionally available; ZB-20) 

*1. The optional 1/8" (c2-125-DGK) diamond scraper can be used as well.

*2. When using the optional 1/8" diamond scraper, use the supplied 1/8" solid collet.

*3. When using the optional burnishing adapter (ZB-20 or BT-BA1M), only an 1/8" diamond scraper (C2-125-DGK) can be used.



Cylindrical Engraving of Metal Objects

❖ Parameter Settings for EGX-360:

- AXIS SWITCHING: XAZ
- CUT IN: OUTSIDE
- REVOLUTION: OFF
- AUTO Z CONTROL: ON
- UP: 200
- DWELL IN PD. POS: 0 sec.
- LOCK LEVER: 1

❖ Parameter Settings for EngraveStudio:

- TOOL: [Diamond (11/64", 120deg. 0.005")]
- FEED RATE: 10-30mm/sec.
- PLUNGE RATE: 5-20mm/sec.
- DEPTH/PRESSURE: 2mm



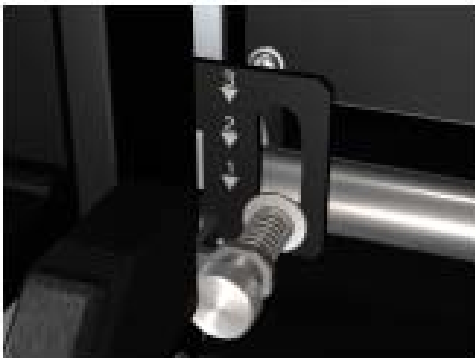
Cylindrical Engraving of Metal Objects

- ❖ Workflow (For details, please refer to the “Engraving Guide, Chapter 1 – Cylindrical Engraving Metal and Resin”)



Step 1 – Setting Up the Machine

- Turn the power ON.
- Using the Handy Panel, set the following parameters.
- OTHERS Menu:
 - ✓AXIS SWITCHING: XAZ
 - ✓CUT IN: OUTSIDE
 - ✓REVOLUTION: OFF
 - ✓AUTO Z CONTROL: ON
 - ✓UP: 200
 - ✓DWELL IN PD POS: 0 sec.

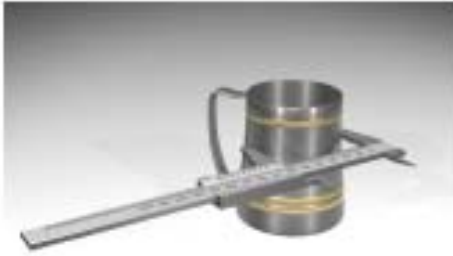


Step 2 – Setting the Lock Lever

- Push and set Lock Lever to the 1 position.

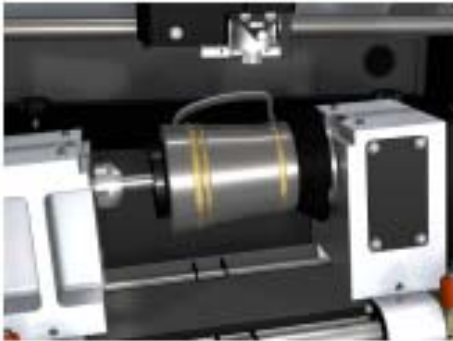


Cylindrical Engraving of Metal Objects



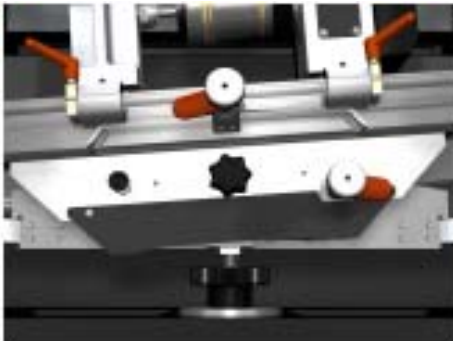
Step 3 – Measure the Diameter of the Object to be Engraved

- a. Measure the outside diameter of the object to be engraved and write down the value in inches or millimeters.



Step 4 – Setting the Tools

- a. Choose the jigs that best fits the object.
- b. Install the solid collet that fits the tool being used.

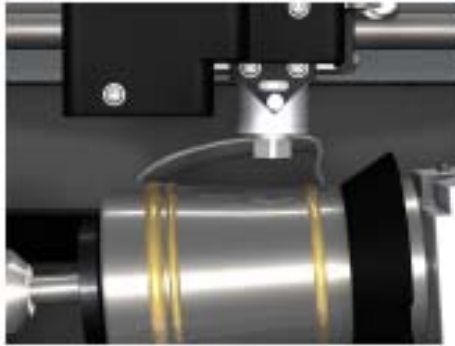


Step 5 – Tilting the Vise Unit and Setting the Collet.

- a. If the object is not an even cylindrical object , tilt the vise unit using the handles located in the front to adjust the angle so that the engraving area is horizontal.

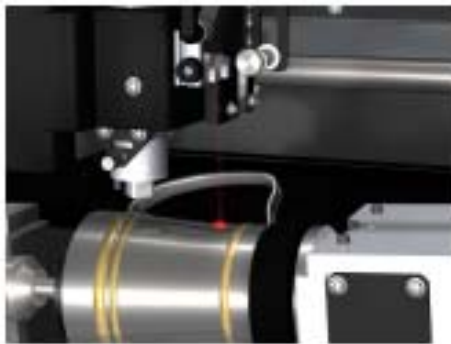


Cylindrical Engraving of Metal Objects



Step 6 – Bringing the Spindle to the Y0 Position

- Close the Cover.
- Using the arrow keys on the Handy Panel, move the spindle in over of engraving area.
- Press the [MENU] key on the Handy Panel, select [Y0] and press the [ENTER] key to move the spindle over the work area.
- Adjust the vise unit up/down handle so that the distance between the collet and the material is about 40mm.



Step 7 – Setting the Work Area

- Select “AREA” in the Handy Panel menu and select the 2 diagonal points on your material you wish to engrave on.
- Confirm the work area by pressing the [ENTER] key. The laser pointer will move to the next position every time the [ENTER] key is pressed.
- Press the [MENU] key to end the preview mode.



Cylindrical Engraving of Metal Objects

The image shows the "Material Setup" dialog box in EngraveStudio. The "Cylinder" radio button is selected and circled in red. The "Diameter (d)" input field is also circled in red. A small diagram of a cylinder with a dashed rectangle around its top surface is circled in red. The "Z Zero" input field is also circled in red. The "XY Origin Position" section shows a square with a central dot and four corner handles. The "Use origin offset" checkbox is unchecked. The "X" and "Y" input fields are both set to "0.0". The "Center vectors in material" checkbox is unchecked. The "Units" section shows the "mm" radio button selected. The "OK" and "Cancel" buttons are at the bottom.

Material Setup

Plate
 Cylinder

Width (x): mm
Height (y): mm
Diameter (d): mm

Thickness (z):
Z Zero mm

XY Origin Position

Use origin offset
X: 0.0 Y: 0.0

Center vectors in material

Units
 inches mm

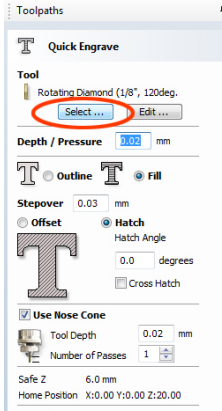
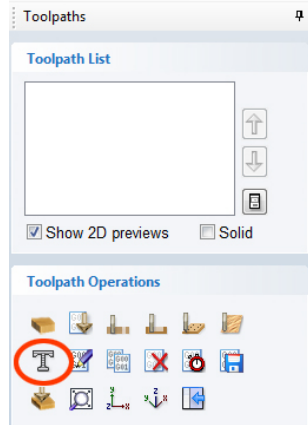
OK Cancel

Step 8 – Setting the Work Area Using EngraveStudio

- Launch EngraveStudio.
- On Material Setup window select Cylinder.
- Input the diameter of the object that was measured in Step 3.
- Click on the Auto Detect button to import the engraving area from the machine.
- Create the design you wish to engrave taking in account the orientation of the material.



Cylindrical Engraving of Metal Objects



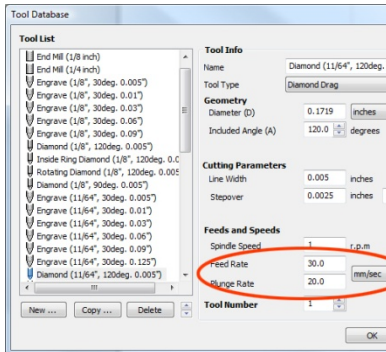
Step 9 – Setting the Cutting Parameters

- Open the Toolpaths window.
- Click on the Quick Engrave Icon.
- Click on Select and choose the [Diamond (11/64", 120deg. 0.005")] cutter from the list.
 - Set the Feed Rate to a range between 10-30mm/sec.
 - Set the Plunge rate to a range between 5-20mm/sec.
- Set Depth/Pressure to 2.0mm



Step 10 – Setting the Cutting Parameters

- Set depth to 2mm
- Click on Output Toolpaths to create the toolpath and transfer the data to the machine.



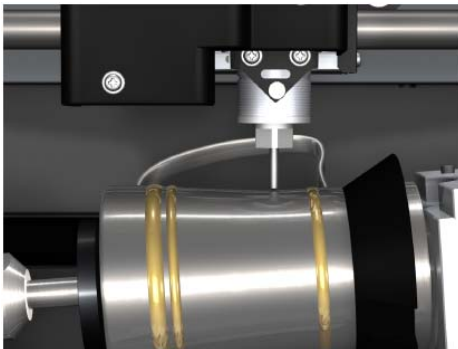


Cylindrical Engraving of Metal Objects



Step 11 – Confirming the Engraving Area

- Select AREA PREVIEW on the Handy Panel to confirm the final output.
- The laser pointer will move to the next corner each time the [ENTER] key is pressed.
- Press the [MENU] key to end the preview mode.

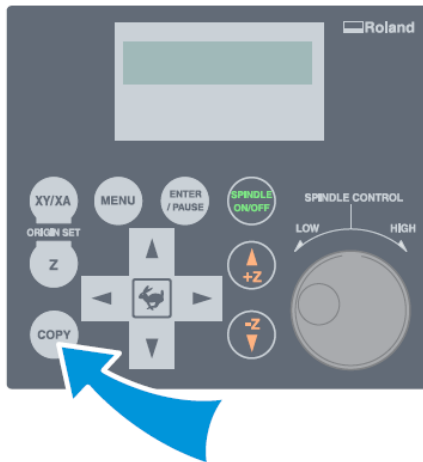


Step 12 – Setting the Tool to the Material

- Insert the diamond scraper from the top of the cutter holder
- Set the tool so that it is approximately 15mm from the bottom of the spindle.



Cylindrical Engraving of Metal Objects

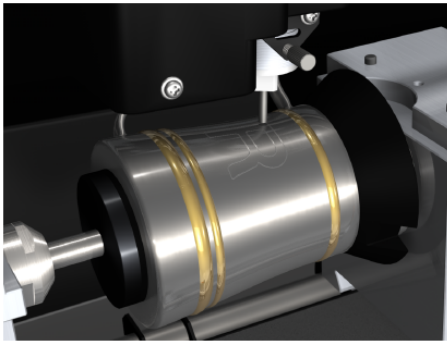


Step 13 – Engraving

- a. Press the [COPY] key, select OK and press the [MENU] key on the handy panel to start engraving.

Step 14 – Confirming the Results

- a. Once engraving is completed, select VIEW from the Handy Panel menu and remove the item from the machine.





Cylindrical Engraving of Metal Objects





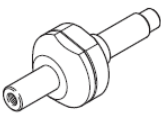
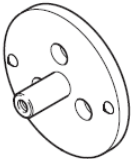
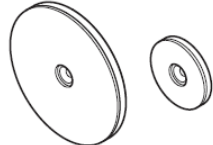
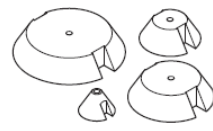
Engraving Wine Bottles (Cylindrical Glass Objects)










Cylindrical Engraving of Glass Objects

❖ Tools required for Glass Engraving

Jigs			
			
Free-end spigot	Cup-cone spigot	Face plates (included items)	Cup cones (included items)
Cylindrical-engraving adapter (included items)			

Cutting Tools	
Cutter types	Other necessary cutting tools
	Burnishing attachment (ZB-20; optionally available) 
	Water nose attachment (included item) 
Rotating diamond cutter (ZDC-A2000R, diameter 3.175 mm; optionally available) 	Nose unit (included item) 
	Solid collet (diameter 3.175 mm; included item) 

1. The 1/8" rotating diamond cutter is optional (C2-125-RDC).
2. When using the optional 1/8" rotating diamond cutter, use the supplied 1/8" solid collet.
3. When using the optional burnishing adapter (ZB-20 or BT-BA1M), only an 1/8" tool can be used.



Cylindrical Engraving of Glass Objects

❖ Parameter Settings for EGX-360:

- AXIS SWITCHING: XAZ
- CUT IN: OUTSIDE
- REVOLUTION: ON
- AUTO Z CONTROL: ON
- DWELL IN PD. POS: 0 sec.
- LOCK LEVER: 1

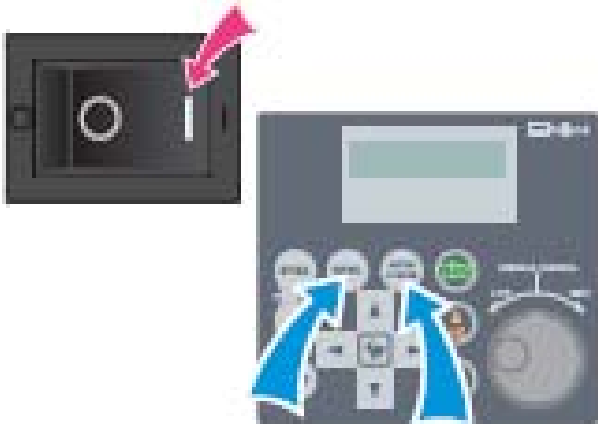
❖ Parameter Settings for EngraveStudio:

- TOOL: [Rotating Diamond (1/8", 120deg. 0.010")]
- FEED RATE: 20-25 mm/sec.
- PLUNGE RATE: 30 mm/sec.
- DEPTH/PRESSURE: 1 mm



Cylindrical Engraving of Glass Objects

❖ Workflow



Step 1 – Setting Up the Machine

- a. Turn the power ON.
- b. Using the Handy Panel, set the following parameters.
- c. OTHERS Menu:
 - ✓AXIS SWITCHING: XAZ
 - ✓CUT IN: OUTSIDE
 - ✓REVOLUTION: ON
 - ✓AUTO Z CONTROL: ON
 - ✓DWELL IN PD POS: 0 sec.

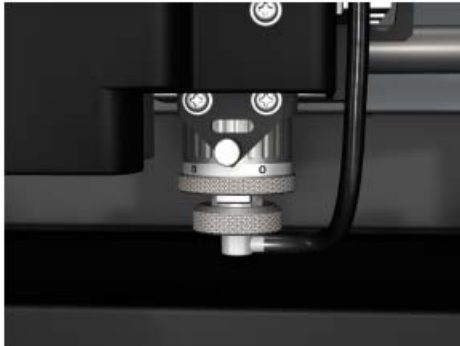


Step 2 – Setting the Lock Lever

- a. Push and set Lock Lever to the 1 position.



Cylindrical Engraving of Glass Objects



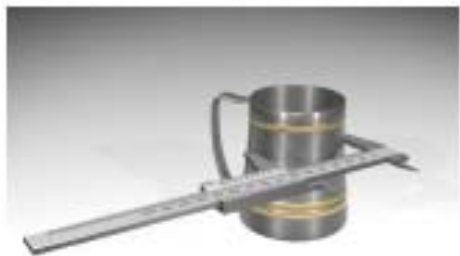
Step 3 – Setting the Tools

- Install the 1/8" solid collet.
- Install the water nose attachment and hose.



Step 4 – Filling the Water Tank

- Pour in 0.3 to 0.5 liter of water in the tank.

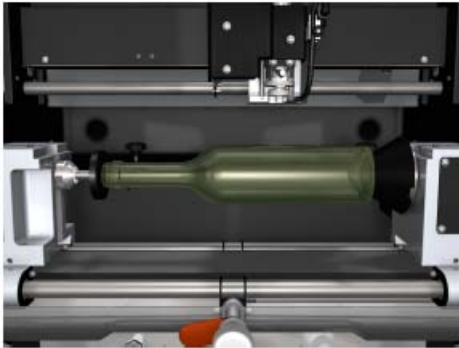


Step 5 – Measure the Diameter of the Object to be Engraved

- Measure the outside diameter of the object to be engraved and write down the value in inches or millimeters.

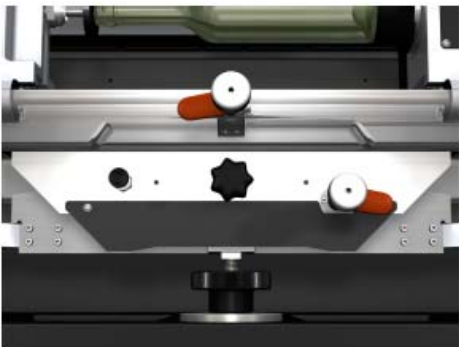


Cylindrical Engraving of Glass Objects



Step 6 – Setting the Jigs

- Choose the jigs that best fits the object.
- Setup the object securely in place.

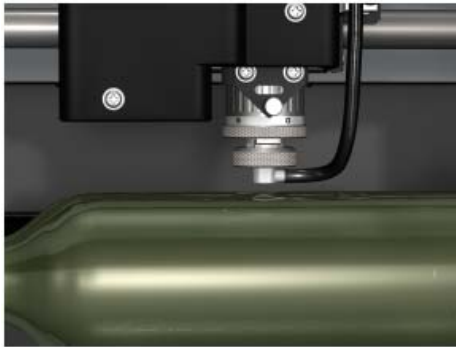


Step 7 – Tilting the Vise Unit.

- If the object is not an even cylindrical object , tilt the vise unit using the handles located in the front to adjust the angle so that the engraving area is horizontal.



Cylindrical Engraving of Glass Objects



Step 8 – Bringing the Spindle to the Y0 Position

- Close the Cover.
- Using the arrow keys on the Handy Panel, move the spindle in over of engraving area.
- Press the [MENU] key on the Handy Panel, select [Y0] and press the [ENTER] key to move the spindle over the work area.
- Adjust the vise unit up/down handle so that the distance between the water nose attachment and the material is about 15mm.



Step 9 – Turning on Pump Unit

- Turn the pump switch ON.
- Hold down the [SPINDLE ON/OFF] key on the Handy Panel to start the spindle.
- Wait until water starts to flow freely.
- Hold down the [SPINDLE ON/OFF] key on the Handy Panel to stop the spindle.



Cylindrical Engraving of Glass Objects



Step 10 – Setting the Work Area

- a. Select “AREA” in the Handy Panel menu and select the 2 diagonal points on your material you wish to engrave on.
- b. Confirm the work area by pressing the [ENTER] key. The laser pointer will move to the next position every time the [ENTER] key is pressed.
- c. Press the [MENU] key to end the preview mode.



Cylindrical Engraving of Glass Objects

The image shows the 'Material Setup' window in EngraveStudio. The 'Cylinder' option is selected under the material type. The 'Diameter (d)' is set to 80 mm. The 'Width (x)' and 'Height (y)' are both set to 40 mm. The 'Thickness (z)' is set to 2.0 mm. The 'Units' are set to 'mm'. The 'Output Direction' is set to 'ABC'. The 'Auto Detect' button is highlighted with a red circle.

Material Setup

Plate
 Cylinder

Width (x): 40 mm
Height (y): 40 mm
Diameter (d): 80 mm

Thickness (z): 2.0 mm

Z Zero

XY Origin Position

Use origin offset
X: 0.0 Y: 0.0

Center vectors in material

Units
 inches mm

Output Direction
 ABC ABC ABC

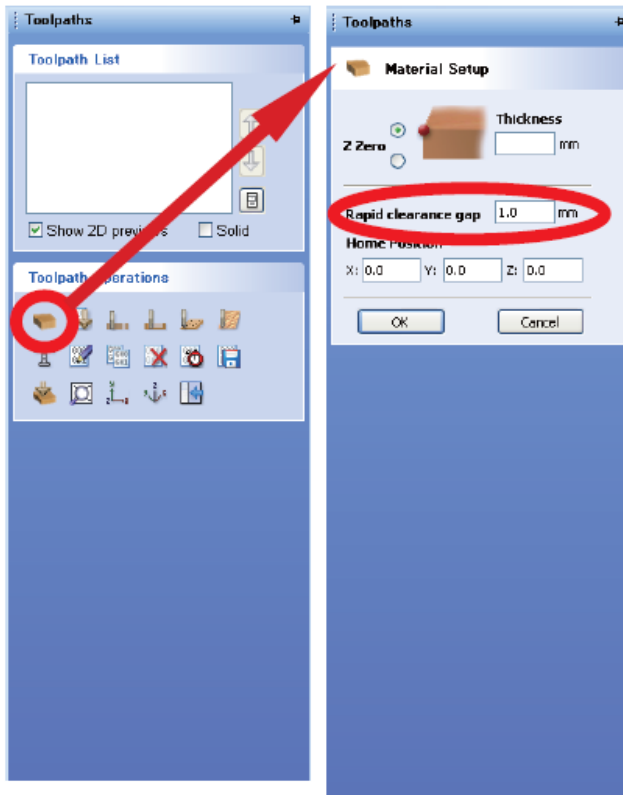
OK Cancel

Step 11 – Setting the Work Area Using EngraveStudio

- Launch EngraveStudio.
- On Material Setup window select Cylinder.
- Input the diameter of the object that was measured in Step 3.
- Click on the Auto Detect button to import the engraving area from the machine.
- Create the design you wish to engrave taking in account the orientation of the material.



Cylindrical Engraving of Glass Objects



Step 12 – Setting the Rapid Clearance Gap

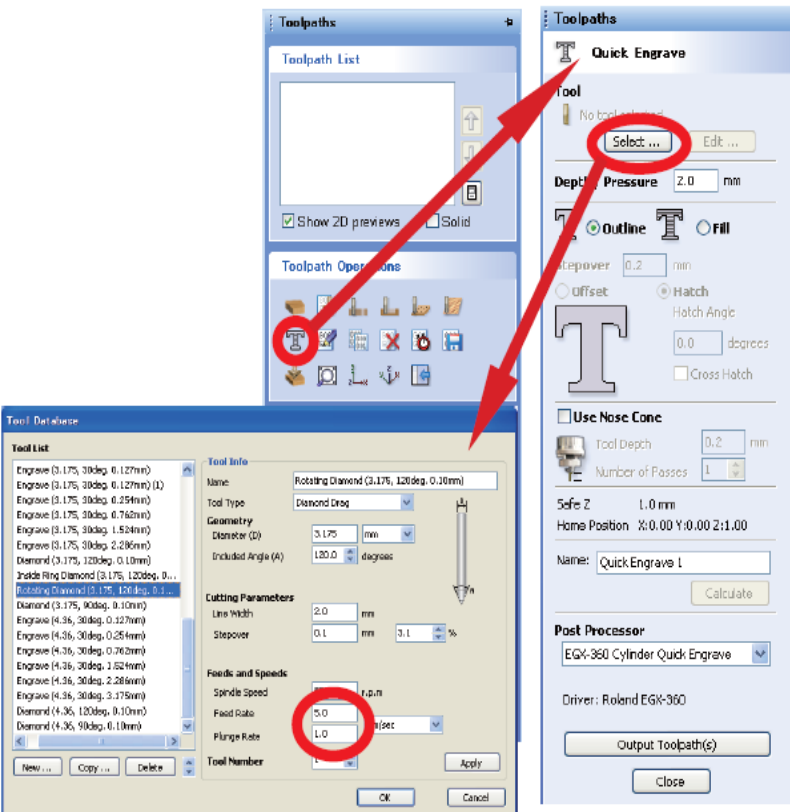
- Click on the Material Setup icon on the toolpath tab.
- Input 1mm in the Rapid Clearance Gap box.
- Click OK.



Cylindrical Engraving of Glass Objects

Step 13 – Setting the Cutting Parameters

- Click on the Quick Engrave icon.
- From the Tool menu click Select
- Select the [Rotating Diamond 1/8", 120deg. 0.010"]]
- Set the Feed Rate to 20-25mm/sec.
- Set the Plunge Rate to 30mm/sec.





Cylindrical Engraving of Glass Objects

Step 14 – Creating the Toolpath

- Input 1mm in the Depth/Pressure box.
- Click on Output Toolpath(s) to create the toolpath and send the data to the machine.





Cylindrical Engraving of Glass Objects



Step 15 – Confirming the Engraving Area

- Select AREA PREVIEW on the Handy Panel to confirm the final output.
- The laser pointer will move to the next corner each time the [ENTER] key is pressed.
- Press the [MENU] key to end the preview mode.

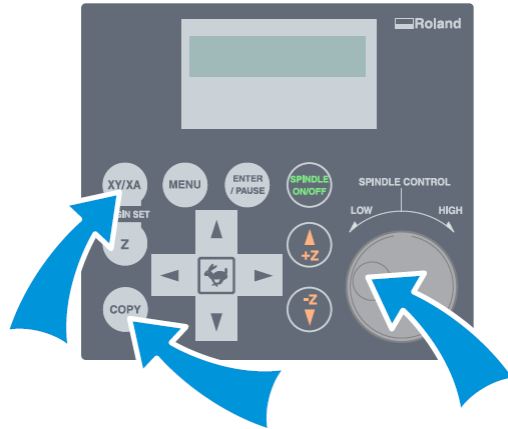


Step 16 – Setting the Tool to the Material

- Set the burnishing attachment to the top of the spindle.
- Insert the rotating diamond cutter (C2-125-RDC) until it protrudes from the bottom of that water nosecone about 1/8".



Cylindrical Engraving of Glass Objects

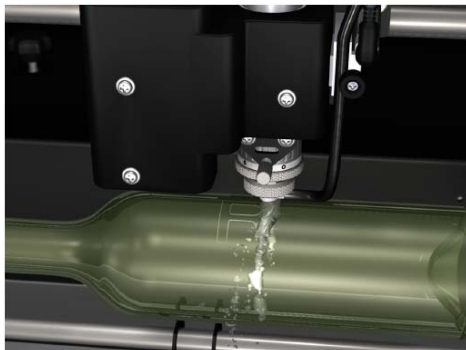


Step 17 – Engraving

- Dial the [Spindle Control] knob to set the spindle speed to between 12,000 & 14,000 rpm.
- Press the [COPY] key and select the OK on the Handy Panel.
- Select CUT on the Handy Panel and press the [ENTER] key to send output the job.

Step 14 – Confirming the Results

- Once engraving is completed, select VIEW from the Handy Panel menu and remove the item from the machine.





Cylindrical Engraving of Glass Objects





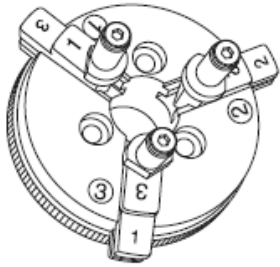

Inside Ring Engraving

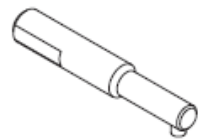
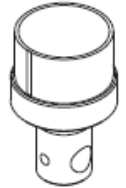




Inside Ring Engraving

❖ Tools required for Inside Ring Engraving

Jigs	
Ring chuck (ZRC-36; optionally available)	
	
Ring chuck unit	Cap screws (M4 x 25 mm)

Cutting Tools	
For inner-surface engraving	
	
Inside ring drug diamond (ZDC-N8000; optionally available)	Tool holder (ZTH-36; optionally available)



Inside Ring Engraving

❖ Parameter Settings for EGX-360:

- AXIS SWITCHING: XAZ
- CUT IN: INSIDE
- AUTO Z CONTROL: OFF
- DWELL IN PD. POS: 0 sec.
- LOCK LEVER: 3

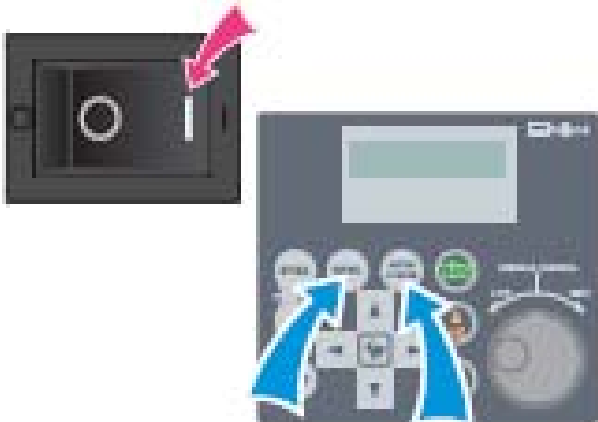
❖ Parameter Settings for EngraveStudio:

- TOOL: [Inside Ring Diamond (1/8", 120deg. 0.010")]
- FEED RATE: 5 mm/sec.
- PLUNGE RATE: 1 mm/sec.
- DEPTH/PRESSURE: 0.1 mm



Inside Ring Engraving

- ❖ Workflow (For details, please refer to the “Engraving Guide, Chapter 3 – Ring Engraving)



Step 1 – Setting Up the Machine

- Turn the power ON.
- Using the Handy Panel, set the following parameters.
- OTHERS Menu:
 - ✓AXIS SWITCHING: XAZ
 - ✓CUT IN: INSIDE
 - ✓AUTO Z CONTROL: OFF
 - ✓DWELL IN PD POS: 0 sec.



Step 2 – Setting the Lock Lever

- Push and set Lock Lever to the 3 position.

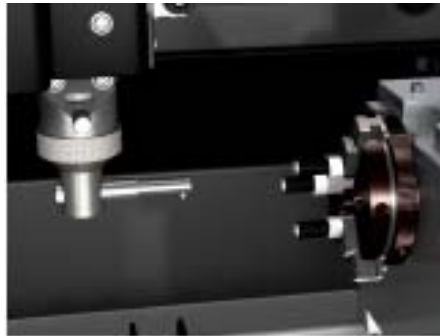


Inside Ring Engraving



Step 3 – Measure the Diameter of the Object to be Engraved

- a. Measure the inside diameter of the ring to be engraved and write down the value in inches or millimeters.



Step 4 – Setting up the Tools

- a. Install the ring chuck (ZRC-36)
- b. Install the tool holder (ZTH-36)
- c. Install the diamond scraper tool (ZDC-N8000)



Inside Ring Engraving

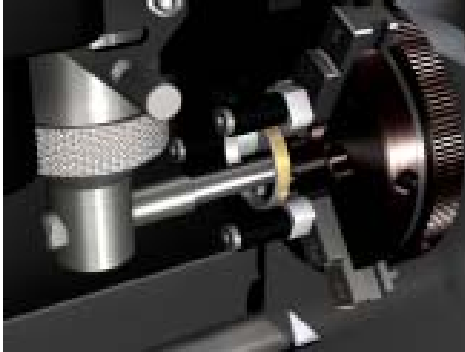


Step 5 – Bringing the Spindle to the Y0 Position

- a. Close the Cover.
- b. Using the arrow keys on the Handy Panel, move the spindle over of engraving area.
- c. Press the [MENU] key on the Handy Panel, select [Y0] and press the [ENTER] key to move the spindle over the work area.
- d. Adjust the vise unit all the way to the top.
- e. Lower the spindle so the tool will be able to go inside of the ring.



Inside Ring Engraving

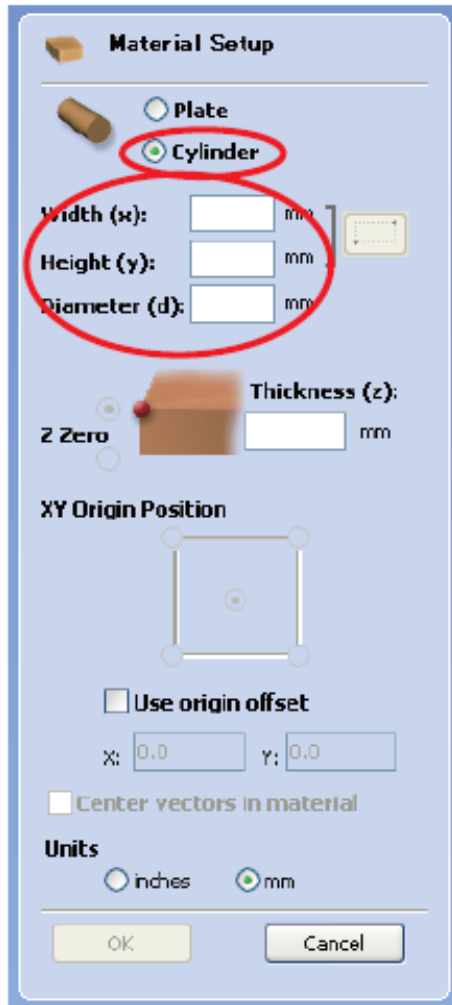


Step 6 – Setting the Origin Point

- Use the Handy Panel move the X and A axis so the tip of the tool is located in the center of the ring.
- Lower the Z axis so the tip of the tool touches the inside of the ring.
- Press the [ORIGIN SET Z] key, select Z0 and press the [ENTER] key to set this position as the Z Origin.
- Press the [ORGIN SET XY/XA] key on the Handy Panel and select X0 and A0.
- Press the [ENTER] key on the Handy Panel to set this as the X0A0 origin point. **NOTE: ensure that you set the origin point as precise as possible as this can affect the engraving area and quality.**
- Move the Z axis spindle up about 2mm and press [Z ORIGIN SET] key on the Handy Panel, select Z2 and press the [ENTER] key to set this as your Z2 (clearance) position.



Inside Ring Engraving

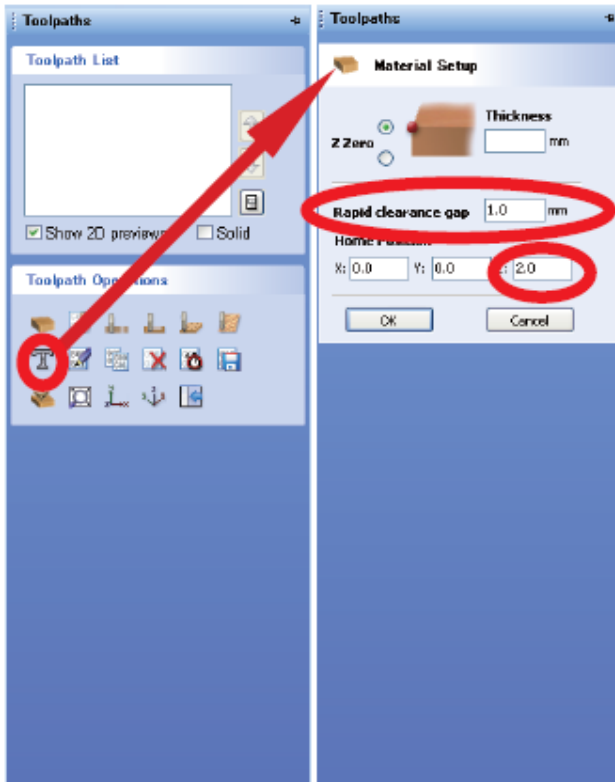


Step 7 – Setting the Work Area Using EngraveStudio

- Launch EngraveStudio.
- On Material Setup window select Cylinder.
- Input the size of the object [Width(X)] and [Height(Y)] .
- Input the inner diameter of the ring you measured back in Step 3.
- Create the design you wish to engrave taking in account the orientation of the material.



Inside Ring Engraving



Step 8 – Setting the Rapid Clearance Gap

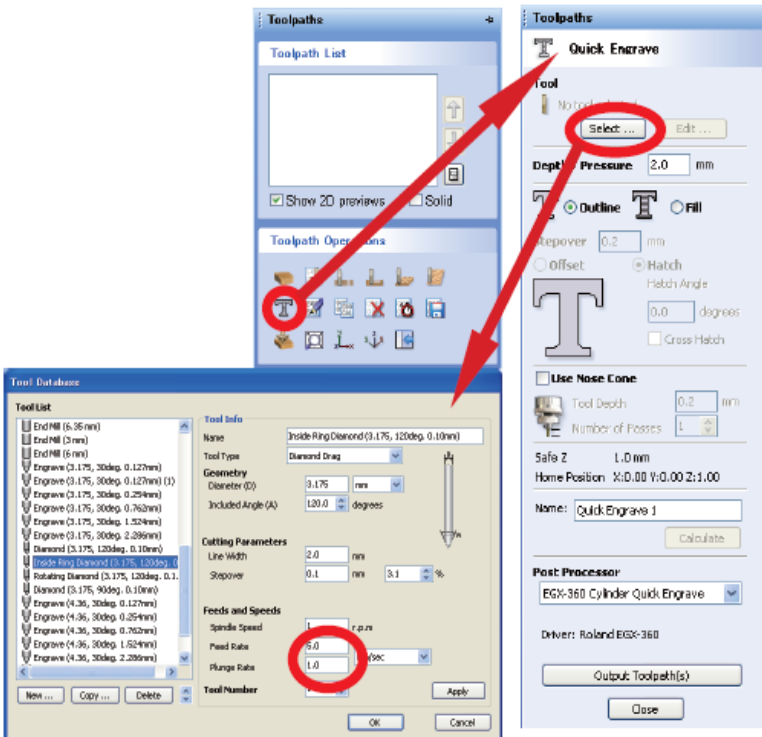
- Click on the Material Setup icon on the toolpath tab.
- Input 1mm in the Rapid Clearance Gap box.
- Input 2mm in the Z located under Home Position.
- Click OK.



Inside Ring Engraving

Step 9 – Setting the Cutting Parameters

- Click on the Quick Engrave icon.
- From the Tool menu click Select
- Select the [Inside Ring Diamond (1/8", 120deg. 0.010")]
- Set the Feed Rate to 5mm/sec.
- Set the Plunge Rate to 1mm/sec.

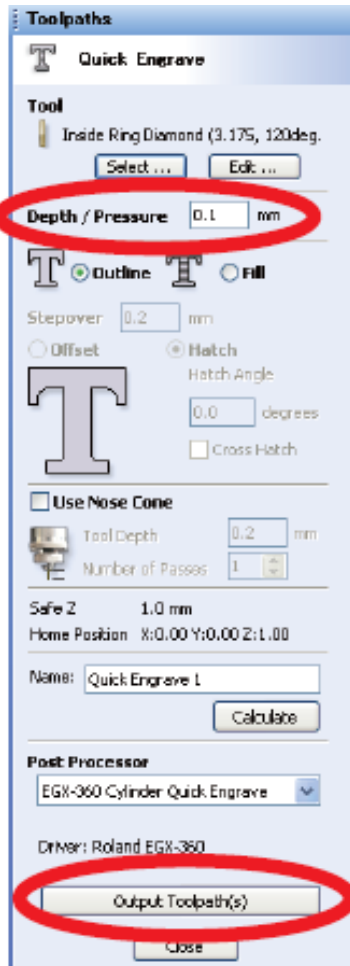




Inside Ring Engraving

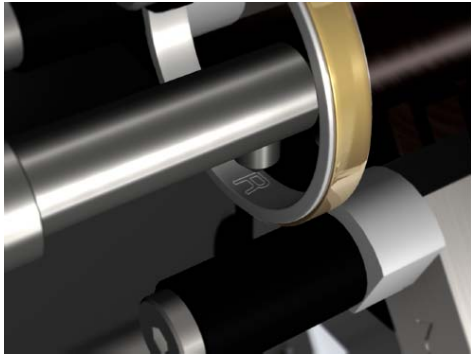
Step 10 – Creating the Toolpath

- Input 0.1mm in the Depth/Pressure box.
- Click on Output Toolpath(s) to create the toolpath and send the data to the machine.





Inside Ring Engraving



Step 11 – Engraving the Inside of the Ring

- a. Select CUT on the Handy Panel to start engraving.
- b. Select VIEW on the Handy Panel after the engraving is completed.
- c. Remove the ring from the ring chuck.



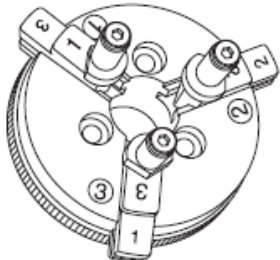




Outside Ring Engraving





Outside Ring Engraving

❖ Tools required for Inside Ring Engraving

Jigs		
Ring chuck (ZRC-36; optionally available)		
		
Ring chuck unit	Cap screws (M4 x 25 mm)	
Cutting Tools		
For outer-surface engraving		
		
Burnishing attachment (ZB-20; optionally available)	Diamond scraper (ZDC-A2000, diameter 3.175 mm; optionally available)	Solid collet (diameter 3.175 mm; included item)



Outside Ring Engraving

❖ Parameter Settings for EGX-360:

- AXIS SWITCHING: XAZ
- CUT IN: OUTSIDE
- REVOLUTION OFF
- AUTO Z CONTROL: OFF
- DWELL IN PD. POS: 0 sec.
- LOCK LEVER: 3

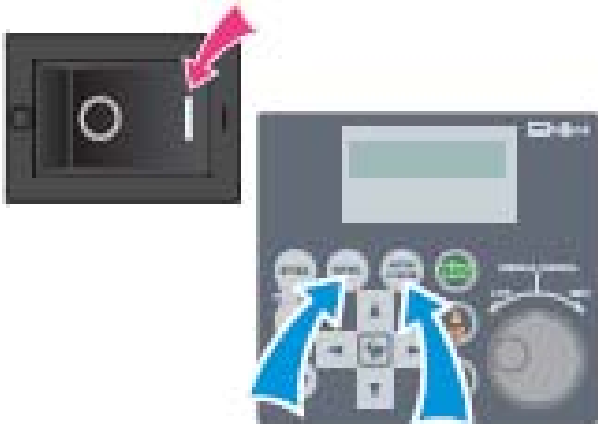
❖ Parameter Settings for EngraveStudio:

- TOOL: [Diamond (1/8", 120deg. 0.010")]
- FEED RATE: 5 mm/sec.
- PLUNGE RATE: 1 mm/sec.
- DEPTH/PRESSURE: 2 mm



Outside Ring Engraving

- ❖ Workflow (For details, please refer to the “Engraving Guide, Chapter 3 – Ring Engraving)



Step 1 – Setting Up the Machine

- Turn the power ON.
- Using the Handy Panel, set the following parameters.
- OTHERS Menu:
 - ✓AXIS SWITCHING: XAZ
 - ✓CUT IN: OUTSIDE
 - ✓REVOLUTION OFF
 - ✓AUTO Z CONTROL: OFF
 - ✓DWELL IN PD POS: 0 sec.



Step 2 – Setting the Lock Lever

- Push and set Lock Lever to the 3 position.

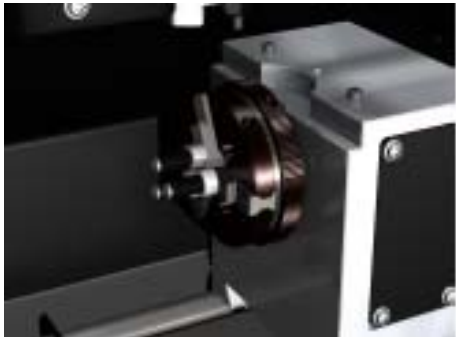


Outside Ring Engraving



Step 3 – Measure the Diameter of the Object to be Engraved

- a. Measure the outside diameter of the ring to be engraved and write down the value in inches or millimeters.



Step 4 – Setting up the Tools

- a. Install the ring chuck (ZRC-36).
- b. Install the 1/8" solid collet.



Outside Ring Engraving

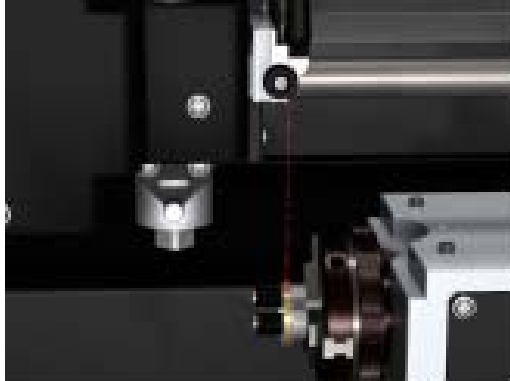


Step 5 – Bringing the Spindle to the Y0 Position

- a. Set the ring into the ring chuck.
- b. Close the cover.
- c. Using the arrow keys on the Handy Panel, move the spindle over of engraving area.
- d. Press the [MENU] key on the Handy Panel, select [Y0] and press the [ENTER] key to move the spindle over the work area.
- e. Adjust the vise unit all the way to the top.



Outside Ring Engraving



Step 6 – Setting the Work Area

- a. Use the Handy Panel select AREA.
- b. Set the 2 diagonal reference points on the ring using the laser pointer.
- c. Confirm the engraving area by pressing the [ENTER] key.
- d. The laser pointer will move to each corner point each time the [ENTER] key is pressed.
- e. Press the [MENU] key to end the preview mode.



Outside Ring Engraving

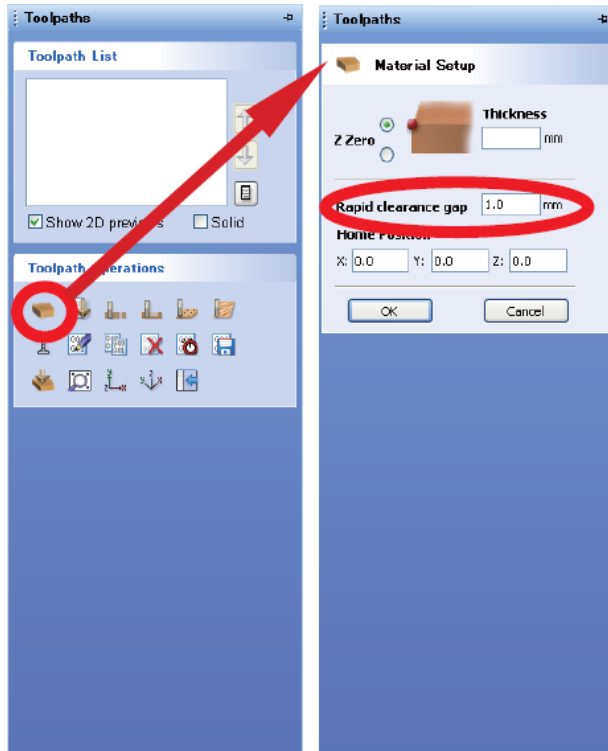
Step 7 – Setting the Work Area Using EngraveStudio

- Launch EngraveStudio.
- On Material Setup window select Cylinder.
- Input the diameter of the ring you measured back in Step 3.
- Click on the Auto Detect button to import the engraving area automatically from the machine.
- Create your design you want to engrave.

The image shows the 'Material Setup' dialog box in EngraveStudio. The 'Cylinder' radio button is selected and circled in red. The 'Diameter (d):' input field is also circled in red. A small inset window shows a diagram of a cylinder with a dashed line indicating the diameter measurement. Other fields include 'Width (x):', 'Height (y):', 'Thickness (z):', and 'Z Zero'. The 'XY Origin Position' section has a diagram of a square with a central dot and a 'Use origin offset' checkbox. The 'Units' section has 'mm' selected. 'OK' and 'Cancel' buttons are at the bottom.



Outside Ring Engraving



Step 8 – Setting the Rapid Clearance Gap

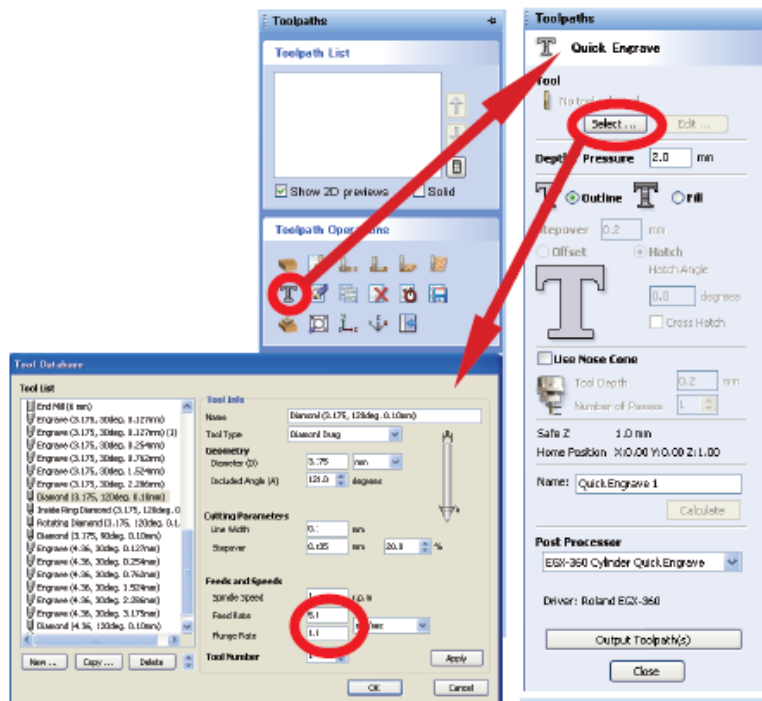
- Click on the Material Setup icon on the toolpath tab.
- Input 1mm in the Rapid Clearance Gap box.
- Click OK.



Outside Ring Engraving

Step 9 – Setting the Cutting Parameters

- Click on the Quick Engrave icon.
- From the Tool menu click Select
- Select the [Diamond (1/8", 120deg. 0.010")]
- Set the Feed Rate to 5mm/sec.
- Set the Plunge Rate to 1mm/sec.





Outside Ring Engraving

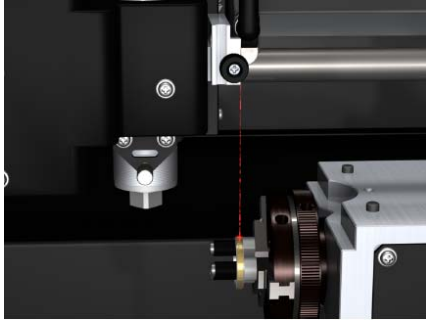
Step 10 – Creating the Toolpath

- Input 2 mm in the Depth/Pressure box.
- Click on Output Toolpath(s) to create the toolpath and send the data to the machine.



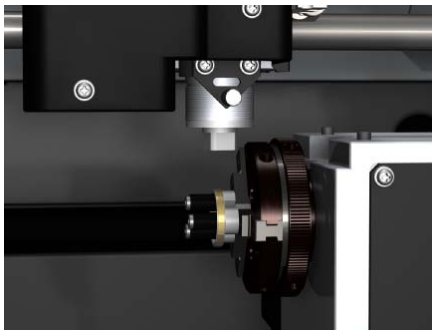


Outside Ring Engraving



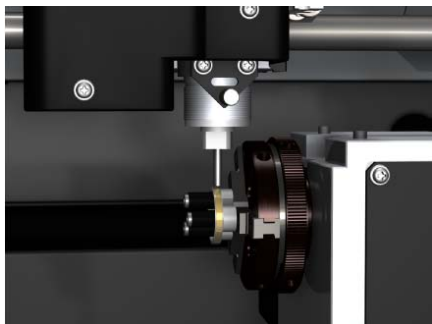
Step 11 – Confirming the engraving area

- Select AREA PREVIEW on the Handy Panel to confirm the engraving area.
- The laser pointer will move from one corner to the next every time you press the [ENTER] key.
- Press the [MENU] key to exit the preview mode.



Step 12 – Preparing to set the Tool

- Use the Handy Panel to move the spindle to the X0/A0 position.
- Use the Handy Panel to lower the Z axis so the bottom of the collet is about 15 mm from the edge of the material.

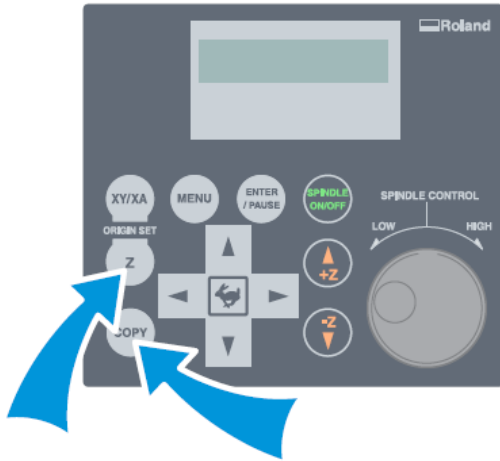


Step 13 – Setting the Tool

- Install the burnishing attachment (BT-BA1M) and tool (C2-125-DGK) to the top of the spindle unit.
- Lower the tool until it touches the surface of the ring.

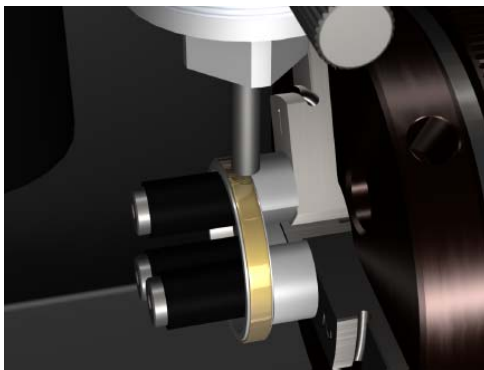


Outside Ring Engraving



Step 14 – Setting the Origin Point

- Press the [ORIGIN SET] key on the Handy Panel.
- Select Z0 and press the [ENTER] key to set the Z0 origin point.
- Press the [COPY] key on the Handy Panel and select OK on the Handy Panel menu.
- Select CUT on the Handy Panel to start engraving.



Step 15 – Checking the Engraving Results

- Select VIEW from the Handy Panel after engraving is complete.
- Remove the ring from the ring chuck



Outside Ring Engraving

