Brass Earrings from Coin Blank Tutorial by Directed T3CH

Find a 3d model (.stl or .obj files)

1. https://makerworld.com/en
2. https://www.printables.com/

Blender Operations

1. Download and install Blender
    1. https://www.blender.org/download/
    2. Manual for Blender: https://docs.blender.org/manual/en/latest/index.html
2. Configure Blender environment to work in millimeters (https://www.youtube.com/watch?v=ZI49VIcISaw)
    1. Set scene units to millimeters by clicking on the scene icon on the right side of the scene (Cone and circle icon). Click on Units, make sure it is set to metric, and then type 0.001
    2. Set Length to millimeters
    3. Change Grid Settings – click the down arrow by viewport overlays (Intersecting circles icon in the top right side of the main window)
        i. Enter 0.001 in the scale window, hit enter
3. Create a 40mm outline for reference. If you are working with a different size coin or other blank you can create whatever shape you like.
    1. Click Add (viewport menu) > Curve>Circle
    2. A box will pop up in the lower left corner of the viewport. Enter your desired RADIUS for the circle you want. Leave the X, Y, and Z coordinates at 0.
4. Import STL file
    1. File>Import>STL
    2. Rotate object as needed using the item menu (upper right corner of viewport) – I rotated my mode 270 degrees in the X axis in the video example.
    3. Use scale command (press S on keyboard) to uniformly scale the 3d model to fit in your blank outline.
    4. Move object using the move cursor (upper right icon menu in viewport, 4 arrow icon)
5. Add Ring
    1. Click Add (viewport menu) > Mesh> Torus
    2. A box will pop up in the lower left corner of the viewport. Enter your desired parameters. I used the following:

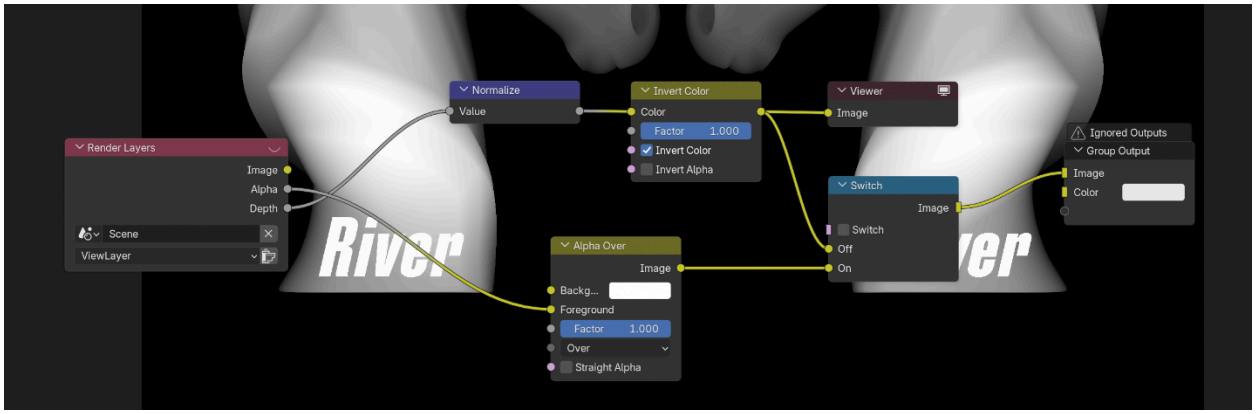
        i. Major Segments: 90
        ii. Minor Segments: 90
        iii. Major Radius: 1.5mm
        iv. Minor Radius: 0.5mm (Remember, total Diameter= 2x(Major Radius + Minor Radius)
        v. Leave the X, Y, and Z coordinates at 0.
    3. Move new torus using the move tool
6. Add Text
    1. Click Add (viewport menu) > Text
    2. Change to Edit Mode (Upper left box in viewport) or hit TAB key and type in the text you want.
    3. Click on “a” icon in the properties area (right of the viewport) then >Font to select the font you’d like to use. The folder icon will allow you to select windos fonts (normally located at C:\WINDOWS\Fonts\)
    4. Click on >Geometry
        i. Enter value in Extrusion to give text some height (I used 0.1 in the video example)
        ii. Bevel is another option you can play with here, but the text is too small in for the earrings in this example to show up.
    5. Position text with the move tool Adjust the z location to get the text visible above the 3d model.
7. Duplicate and position model if desired
    1. Select all objects you want to duplicate by clicking on the first object with the left mouse button, then while holding down the SHIFT key, click on the next item.
    2. Press CTRL+C then CTRL+V to copy and paste new versions of the objects you previously selected. Use the move tool to position them both.
    3. Rotation can be applied if desired.
8. Use the move tool and Location values (in the item box) to ensure everything is symmetric (z axis is the most important)
9. Camera Position (https://youtu.be/7_9uS2ixBCs?si=2cop2wfur95Rb86M)
    1. Set camera position – Click on the camera icon or select it in the scene collection.
    2. Set the location to X:0 Y:0 Z:0 in the Item tab (if you cant see it, press ‘N’ on your keyboard.
    3. Set the rotation to X: 0 Y:0 Z:0 as well
    4. Use the move tool to raise the camera above the 3d models
10. Camera Parameters

1. In the properties area (right of the viewport), select the Output icon (looks like a printer), select >Format, and set Resolution X and Y to 2048
2. Under >Output set color depth to 16 and compression to 0.
3. In the properties area (right of the viewport), select the View Layer icon (looks like a stack of photos), click on >Passes, then >Data and check both “Combined” and “Depth”
4. Make sure the camera is still selected in the viewport, and In the properties area (right of the viewport), select the Camera icon (the one near the bottom that looks like a movie camera), click >Lens and set Type to Orthographic
    i. In the viewport window, press the camera icon below the navigation gizmo to toggle the camera view on. Then click in the Orthographic scale window and move your mouse left and right while holding down the mouse button to get your full model outline in view of the camera.
    ii. Set Clip start to 0 (it will change to 0.000001mm automatically)
    iii. **CRITICAL** This next step determines how deep your camera looks. If not set properly, your depth map won’t be very good. Click in the End box, hold down the mouse button and move the mouse to the left all the way to 0. While still holding down the mouse button, slowly start moving the mouse to the right. You will start to see your model appear again, starting with the objects closest to the camera. Keep slowly moving to the right until the circle comes into view and release the mouse button. Now the camera is only looking at that depth range and you should get a nice depth map with good contrast.
    iv. Test your settings by clicking Render in the main program menu (very top left of the screen (next to File and Edit) and then select “Render Image”

11. Compositing Setup
    1. Click on the Compositing Tab above the viewport window
    2. In the top center of the viewport window, click on the +New button. This will add a Renders Layer node, a Group Output Node, and an Viewer Node. You will also see a rendered image in the background.
    3. Click Add>Utililities>Normalize to add a normalize node. Place it between the Render Lavers node and the Viewer and Group Output Nodes. If you place it on the connecting line, the line will turn white and it will automatically connect when you release the mouse button.

4. Click on the connecting node on the left side of the normalize box, and drag to the depth node on the Render layers box. This will replace the image connection and you will now have a depth map! But we need to reverse the image still.
5. Click Add>Color>Invert Color and drag the box to the right side of the normalize node.
6. In the properties panel (right of the viewport), click on the Render icon (looks like the back of a digital camera), scroll down to >Color Management and change Display to Display P3, and change View to RAW.
7. You now have the first part of the depth map! If you are just making a coin and you don't need to cut anything out, you can skip ahead to the Lightburn section.
8. Select Render, Render Image. In the window that pops up, Click on Image and then Save As. Save your depth map file to use in Lightburn.

12. Creating a Mask for cutout vector creation.
    1. While still in the Compositing view, click Add>Color>Alpha Over and place the new Alpha Over in a free area.
    2. Connect the Alpha Output of the Render Layers node to the Foreground input of the Alpha Over node.
    3. Add a switch by clicking Add>Utilities>Switch. Place this to the right of the Alpha Over node and connect the Image node from the Alpha Over Node to the On input of the Switch Node. Move the Output of the Invert Color Node to the Off input of the Switch Node. Now connect the Image output of the Switch to the Image input on the Group Output Node.
    4. In the properties panel, under Render (icon looks like the back of a digital camera), find >Film and under the Filter Size box, there is a check box for Transparent. Check this box. (You will need to uncheck this anytime you want to create a depth map).
    5. Click the check box next to "Switch" in the Switch Node to turn it on.
    6. Select Render, Render Image (or press F12). In the window that pops up, Click on Image and then Save As. Save this file and name it mask so you can tell it apart from the depth map file created earlier.
    7. You may want to turn off the switch, and uncheck the Transparent box before saving your file. We are now done in Blender!

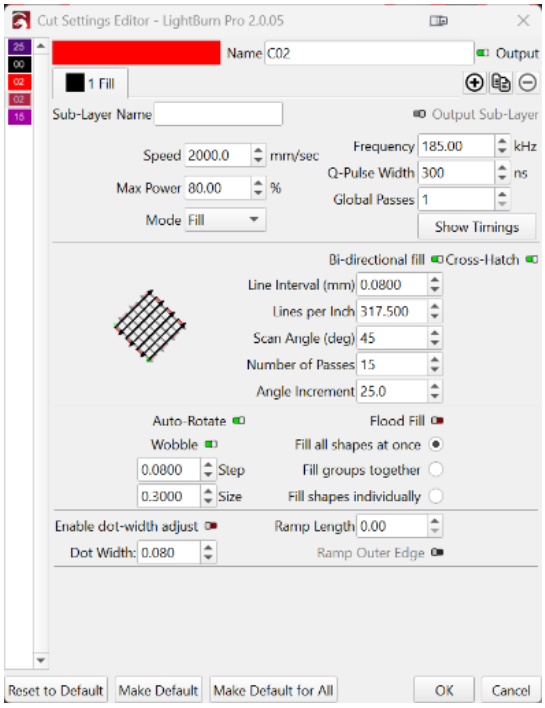


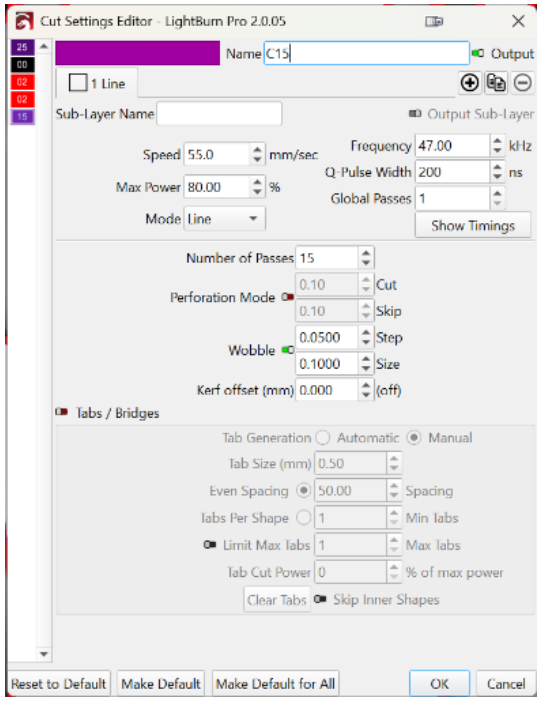
Lightburn Operations

Open Lightburn. I've included a Lightburn file with my coin template for a 40mm coin that has a few concentric circles. You can create your own template if need be. It's best to place the template in the center of the page.

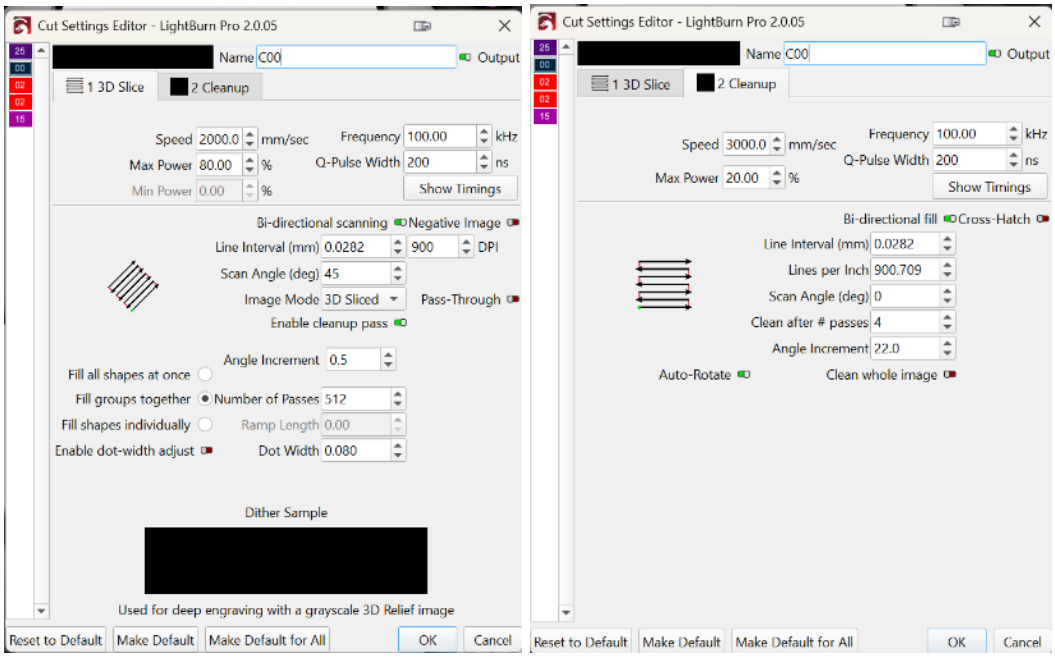
1. Import the depth map (File>Import). Place it in page center and scale it down to fit the template. Holding CTRL while dragging a corner of the image scales it uniformly and keeps it centered. Note the final size and X/Y coordinates
2. Import the Mask file using the same process as above, and place it in the same position with the same size. Change the layer color of this map to keep it separate from the depth map.
3. Hide the depth map from view, and then select the mask. Click on Tools> Trace Image to get a vector from the mask. Turn off the mask image so you can just see the vector. Ungroup the vector and delete the square around the object outline vector.
4. Select the vector you just created, but if you have a ring like in the example, make sure that you don't select the inner circle of the ring yet. Select the Offset Shapes button and choose "Outward" and 0.1mm
5. Now select the inside rings (Hold shift to select multiple objects) and then do the same operation with the Offset shapes button, but this time choose "Inward" and 0.1mm
6. Select the outermost sections of the vectors you created in step 4 and press CTRL+C, then ALT+V to copy and paste new vectors over the ones you just copied. Make these new vectors a new layer color.

7. Select the innermost ring sections of the vectors you created in step 5 and press CTRL+C, then ALT+V to copy and paste new vectors over the ones you just copied. Make these new vectors the same color as you chose in step 6.
8. Select all of the outermost vectors again (created in step 4) and group them together by pressing CTRL+G and make sure that this vector is selected. Press CTRL+C then ALT V to copy and paste a new vector in the same place. Assign a new vector color to this new vector. This will be the outline used to crop the depth map in the next step.
9. Turn on the depth map image and hold SHIFT while clicking on it to select that also. Then right click and choose Crop Image. This will crop your depth map and it will add that thin black outline to ensure it gets cut out (make sure that the inner circle of the ring doesn't get cropped or you'll have a post inside your loop). Then next steps are for a cutting pass if you need one
10. To create an additional cut out area, you can use the vectors you created in steps 4 and 5 and just set the Mode to Fill instead of line. If you want a single line cut vector, just ungroup those vectors, choose the same outermost vectors and duplicate this vector and use my single line cut parameters. These are my Outline Final Cut and Slow Line Cut settings:





11. Set the depth map image for a 3D sliced process. Here are the parameters that I use for this:



12. Save the file and send it! I turn off the outline cut and slow line cut and just run the image depth map (3D slice) layer first. If it doesn't fall out, I'll run either of the two other layers depending on how much material is left. You can change the number of passes from 15 to 50 or 100 if need be. Just alternate between the two layers until the object is cut out from the blank.

Useful Links (Amazon Affiliate):

40mm Coin Blank - https://amzn.to/498hYsA

Magnetic Tumbler - https://amzn.to/3LpiNpe

Shine Bright Burnishing Compound - https://amzn.to/3LtdgxT

Bench Buffer/Polisher - https://amzn.to/44S43G5

Earring Hooks – https://amzn.to/3Lg6mMr

Earring Cards – https://amzn.to/3Yhw46f

Earring Backs - https://amzn.to/4beEwdY