3DESIGN
SOFTWARE SOLUTION

TRAINING MATERIAL

GRAVOTECH
by BRADY

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Legal

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Content

Essential Software Controls

Mouse:

In the main window:

- Click left : Select
- Double Left Click: Change Selection
- Swipe left: select in frame
- Right-click: shortcut menu or iris
- Swipe right: rotate the object
- Drag + shift right: rotate the object around the vertical axis
- Swipe right + mouse wheel click: move the object
- Swipe Right + Alt: Zoom in on the frame
- Rotate the mouse wheel: zoom in or out
- Left + right click: central display on the cursor
- Hold down the right key + Alt + Ctrl: zoom in on the cursor

In a data field in the Properties window:

- Mouse wheel: increase/decrease value by 0.1 mm
- Mouse Wheel + Offset: Increase/decrease value by 1mm
- Mouse Wheel + Alt: Increase/decrease value by 10 mm

In the Sketch module:

- Select → Drag Left + Shift: Duplicate a Shape
- Select → Drag Left **+** Ctrl: Separate two overlapping line points
- Double-click on a point: line on point / curve via
- Double-click on a curve: add a point (on a curve)

Keyboard:
In a data field in the Properties window:

- TAB: Skip to the next text box / confirm the entered values
- ENTER: Confirm

In the Sketch module:

- Spacebar: To complete a curve
- Delete: To delete a point
- Ctrl: To draw shapes with sharp angles
- Shift + drag: to copy lines
- Ctrl + drag: to disassemble the overlapping points
- Ctrl+ window to select multiple points

Menu Options: Tools with * after name: Submenu available: Shift + click and the menu opens in Properties

In the Sketch module: Tab key to switch views. (Good for 3D fit)

Appendix: Keyboard shortcuts

Mac users should use Command for Ctrl and Option for Alt. Some keyboard shortcuts may be slightly different or may not be available. The most common keyboard shortcuts are:

Shortcut keys

MENU	**ORDER**	**SHORTCUT**
File	Open the document	Ctrl + O
	Save the document	Ctrl + S
	Close Document	Ctrl + F4
	Exit	Alt + F4
	New document	Ctrl + N
Modifier (**EDIT**)	Cancel	Ctrl + Z
	Repeat	Ctrl + Y
	Copy	Ctrl + C
	Glue	Ctrl + V
VIEW	Zoom	Ctrl + '+'.
	Zoom out	Ctrl + '-
	Top view	Ctrl + 1
	Bottom view	Ctrl+2
	Front view	Ctrl + 3
	Rear view	Ctrl + 4
	Left side view	Ctrl+5
	Right view	Ctrl+6
	Isometric	Ctrl+ 7
	Perspective	Ctrl+8
	Normal to	Ctrl+9
Tools	Options	F12
HELP	Contextual help	F1
	Automatic	Via the menu

Viewpoints

	3-button mouse	2-button mouse
Zoom	Mouse wheel	Alt + Ctrl + Drag Left1
Move the plan	Swipe right	Alt + Drag Left
Field rotation	Press the mouse wheel + Right-drag	Alt + Shift + Drag-Left
Turn the plan Around the Y-axis	Shift + Swipe Right	Shift + Alt + Left-click*
Zoom in detail	Alt + Right Click + Window Selection	
Focusing on a certain point	Left-right click	
Zoom in on the position of the mouse cursor	Right click (held) + Alt + Ctrl	

Sketch Module

Order	Shortcut keys
Select all	Ctrl + A
Duplicate	Select the parts to duplicate, Shift + Drag to Left
Separating two overlapping points of two different curves	Select the element to be separated and then Ctrl + Swipe left
Separating two overlapping points on the same curve	Ctrl + Select the point to separate, drag left
Duplicating a Curve Part	Selecting the points to duplicate with Ctrl then Shift + Drag to the left

Delete points (Freeform curves only)	Delete
Delete the last point (By drawing the curve)	Flashback
Change the artboard	TAB
Point in/out of the curve	Double-click the point
Add a point on a curve	Double-click on the curve
Break a point (on the curve)	Ctrl + Double-click on a point on the curve
Automatic connection of curves	Shift + Curve Selection
Move the point	Click on the point and move with the arrow keys

[1] Swipe Left: Hold down the left mouse button and move.
[2] Right Click: Hold down the right mouse button and move.
***Not available for Mac users.**

Notes:

3DESIGN

Step-by-step exercise

Introduction

Note:
To work with the different perspective views, it is recommended to use a mouse with a scroll wheel. For mice without wheels, it is necessary to use the various shortcuts given in the appendix of this document.

Exercise: Solitaire ring

This exercise guides you step-by-step through creating a solitaire ring using curves as a base and specific 3D design tool.

Here is the result:

This exercise includes:

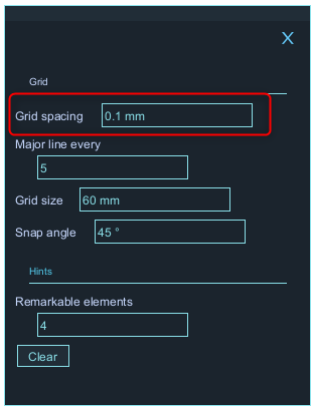
- Draw a curve.
- Use of the Sweeping Wizard.
- The use of the deformation tool.
- Creating volumes (Solids).
- The use of Boolean operations.
- Create a setting for a stone.
- Create detailed 3D views of the ring

A. Drawing a Section

1. On the 3DESIGN home page, click  .

2. Click the **Go to Sketch Module**  icon to access the Drawing Module. To make drawing easier, use a grid. At the top of the sketch window are the **Snaps icons**.

Click the Snap **dialog icon**  and set **the grid spacing** to 0.1 mm.



Click the **Enable/Disable Snapping to Grid icon**  . This will cause the cursor to jump from one intersection to the next instead of moving freely across the grid.

3. Select the **Symmetrical Vertical curve (Plane) tool** in the Draw section  . Click the points in the main window or enter the coordinates in the Properties window.

To draw a curve in the main window

First, in the Properties window**, make sure that the Close Curve check box** is selected. Make sure the **Edit Mode check box** is cleared.

Click on the points with the coordinates. They are indicated in blue at the bottom of the main screen

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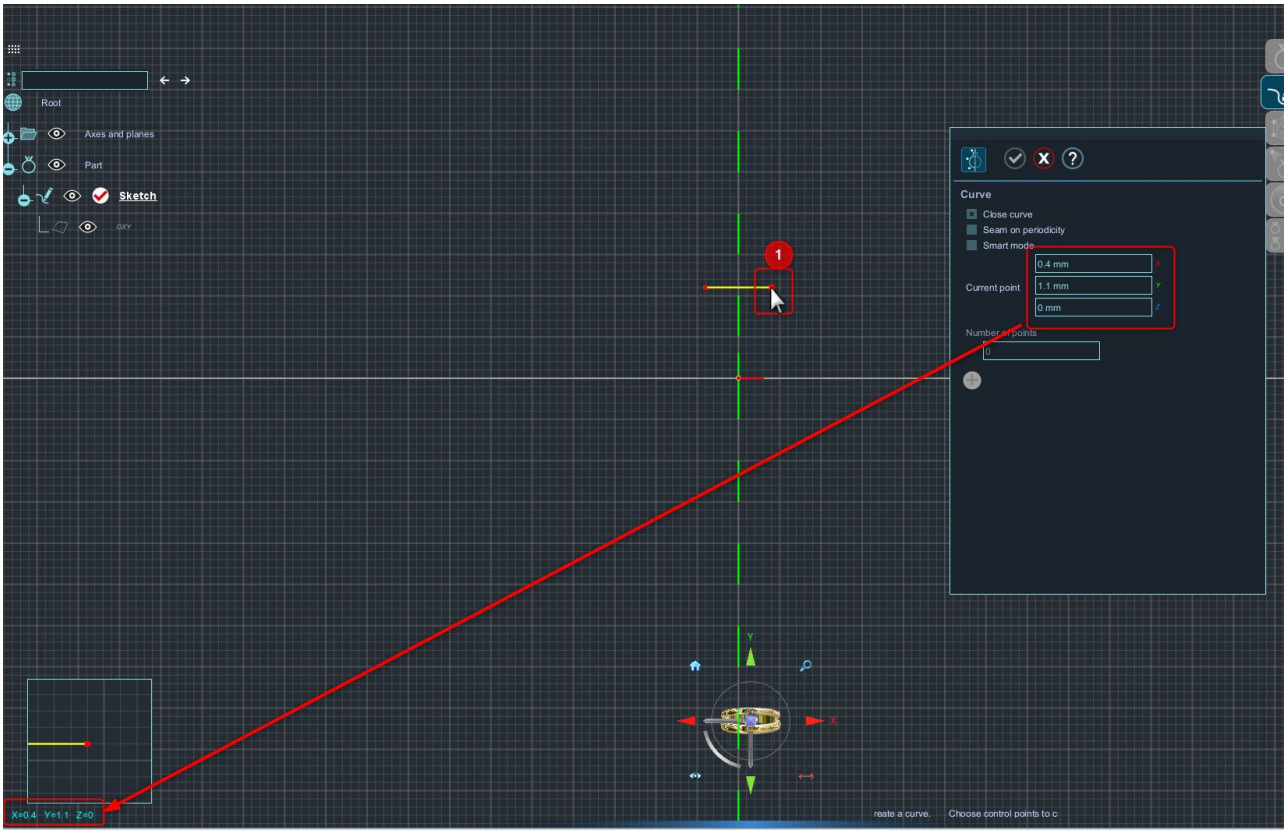
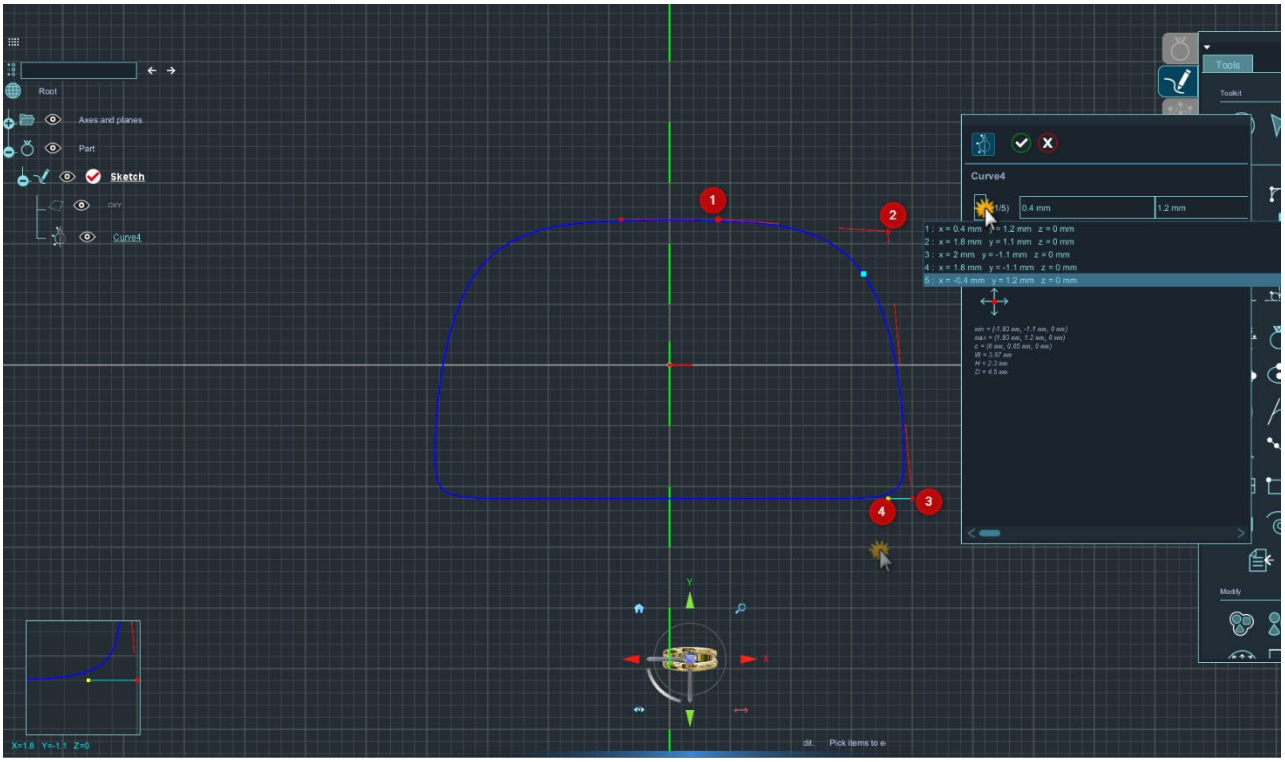
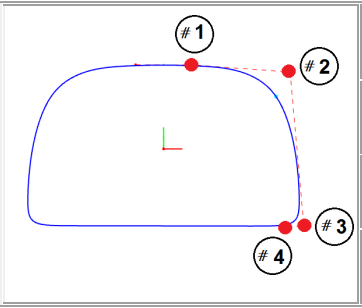

Root
Axes and planes
Part
Sketch
Curve
Close curve
Seam on periodicity
Smart mode
Current point
0.4 mm
1.1 mm
0 mm
Number of points
1


Root
Axes and planes
Part
Sketch
Curve4
Tools
Toolkit
Curve4
0.4 mm
1.2 mm
1 : x = 0.4 mm y = 1.2 mm z = 0 mm
2 : x = 1.8 mm y = 1.1 mm z = 0 mm
3 : x = 2 mm y = -1.1 mm z = 0 mm
4 : x = 1.8 mm y = -1.1 mm z = 0 mm
1
2
3
4



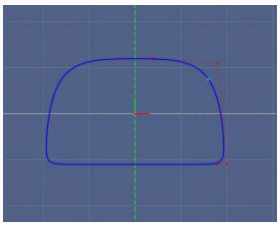
Item #1	X = 0.4 mm Y = 1.2 mm
Item #2	X = 1.8 mm Y = 1.1 mm
Item #3	X = 2.0 mm Y = -1.1 mm
Point #4	X = 1.8 mm Y = -1.1 mm

Create the points one at a time (left click on the appropriate grid trim point). Draw the curve to the right, clockwise. This Symmetrical Vertical Curve tool creates an exact mirror image of the curve on the other side of the mirror field.

Press the green checkmark to complete the curve.

Select the curve again by selecting it and check the coordinates of the curve points in the Properties window or click the curve points one at a time (except for the additional point, mirror image of the first point) and check the **X** and **Y** coordinates. Correct them if necessary. Correct them if necessary. Use the Tab key to move from **the X** field to the **Y field**.

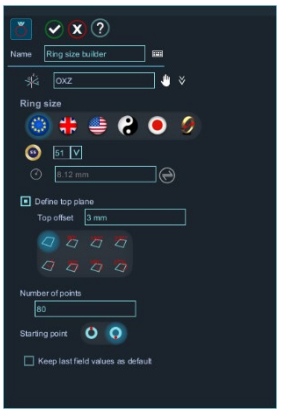
The following curve will appear in the main window:



4. Click the Output Sketch module icon to switch to the SOLIDS module.

Click on **the Exit Sketch module** icon to return to the Solid Creation part

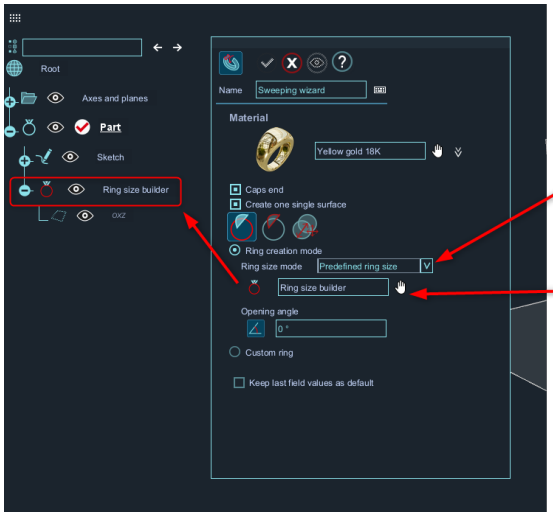
B. CREATE A RING



5. Go to Jeweler's workbench and click on the Finger **Size builder** icon. Set the finger size to size "Europe" 51.

Press the green checkmark .

6. Open the **Sweeping Wizard** tool in the ring creation



In the Properties window, in the "Rail" tab , the ring creation mode is selected. Select "**Predefined ring size**" in the **Ring Body Type window** and select the Ring **size builder** in the tree using the hand .

In the "Profile(s)" tab , in the Profile list box, click Add .

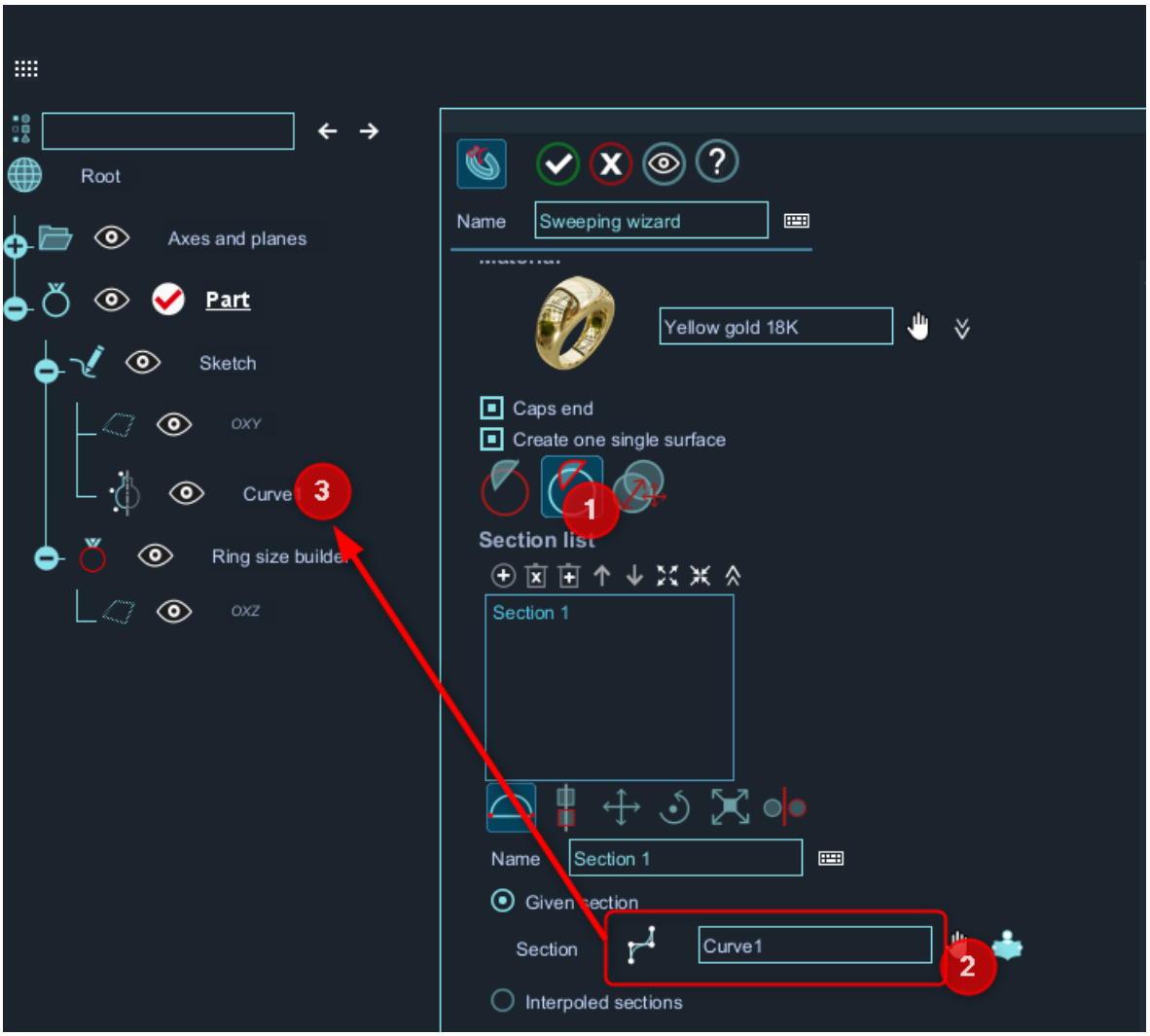
Six new tabs will automatically appear at the bottom (see below).

If necessary, the light blue scroll bar can be pulled down to make the menu screen visible.

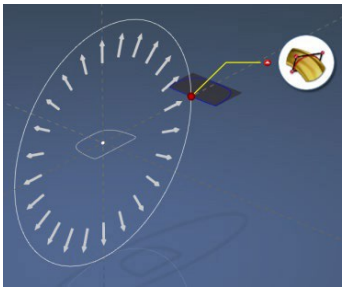
Click on the hand to select

Now we need to select the section, i.e. the curve that has just been drawn.

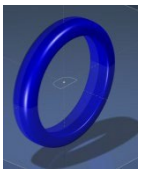
On the tab , select the **given Profile plan, click the Hand,** and select the curve by clicking it in the main window. The curve turns dark blue, and its name is automatically displayed in the plane of the given Profile section.



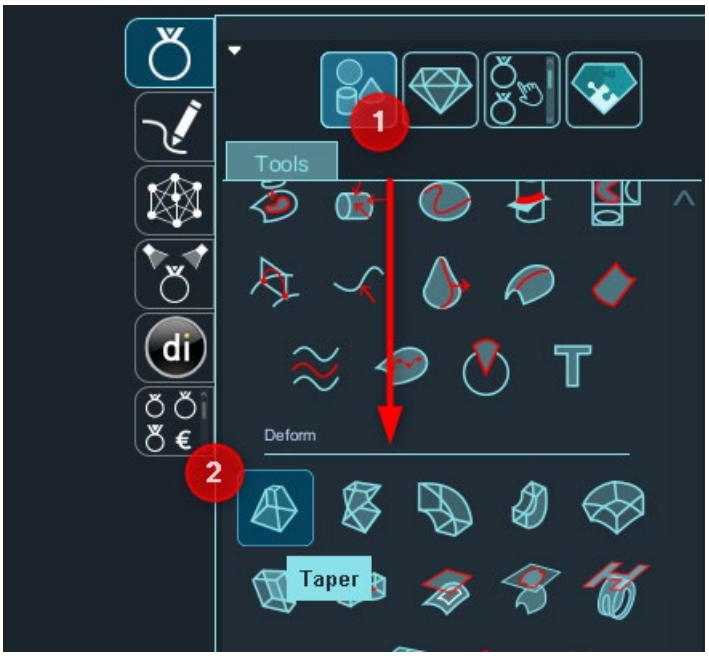
Press the green checkmark .



C. DEFORM THE RING

7. Select the ring from the main window. The ring turns dark blue: 

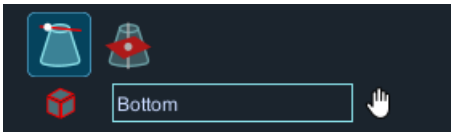
8. Click Create solid tools  Open the **Taper**  tool in the **Deform tools**.



The main screen is now displayed:

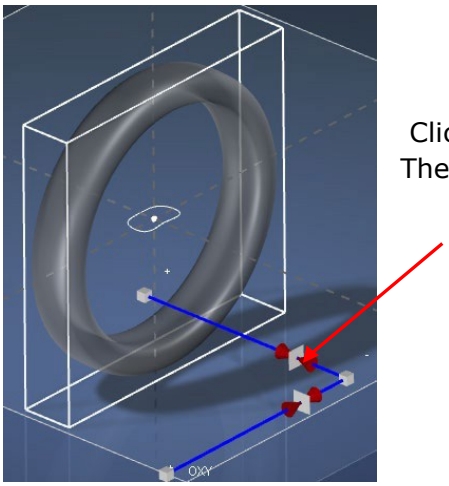
To make it easier to select the side you want to warp, click  . On the compass at the bottom of the screen

In the Properties window**, in the** Main tab**, in the**  Side to deform **plane, select the "Bottom" by clicking on the red arrows at the bottom of the ring:**



"Underneath" will be automatically placed in the Side to Warp plane**.**

The main tab is now displayed:



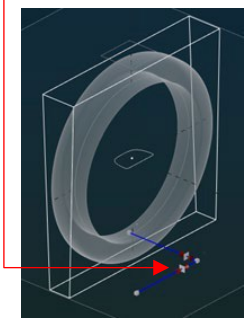
Click the lower red arrows to select the bottom side of the ring. These then turn into sliding zones.

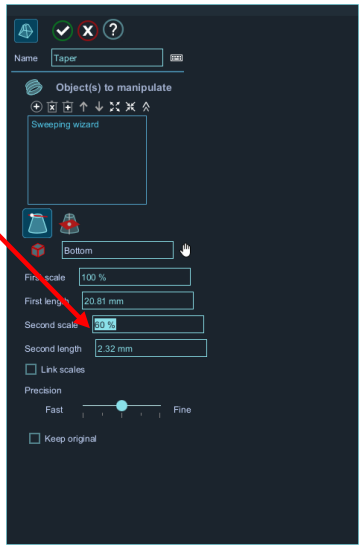
The ring will be deformed.

For this purpose, still in the Main tab  , the Second Scale is set at 60%.

Fill in the **Second Scale** 60%

Or shoot the arrows





Press the green checkmark  .

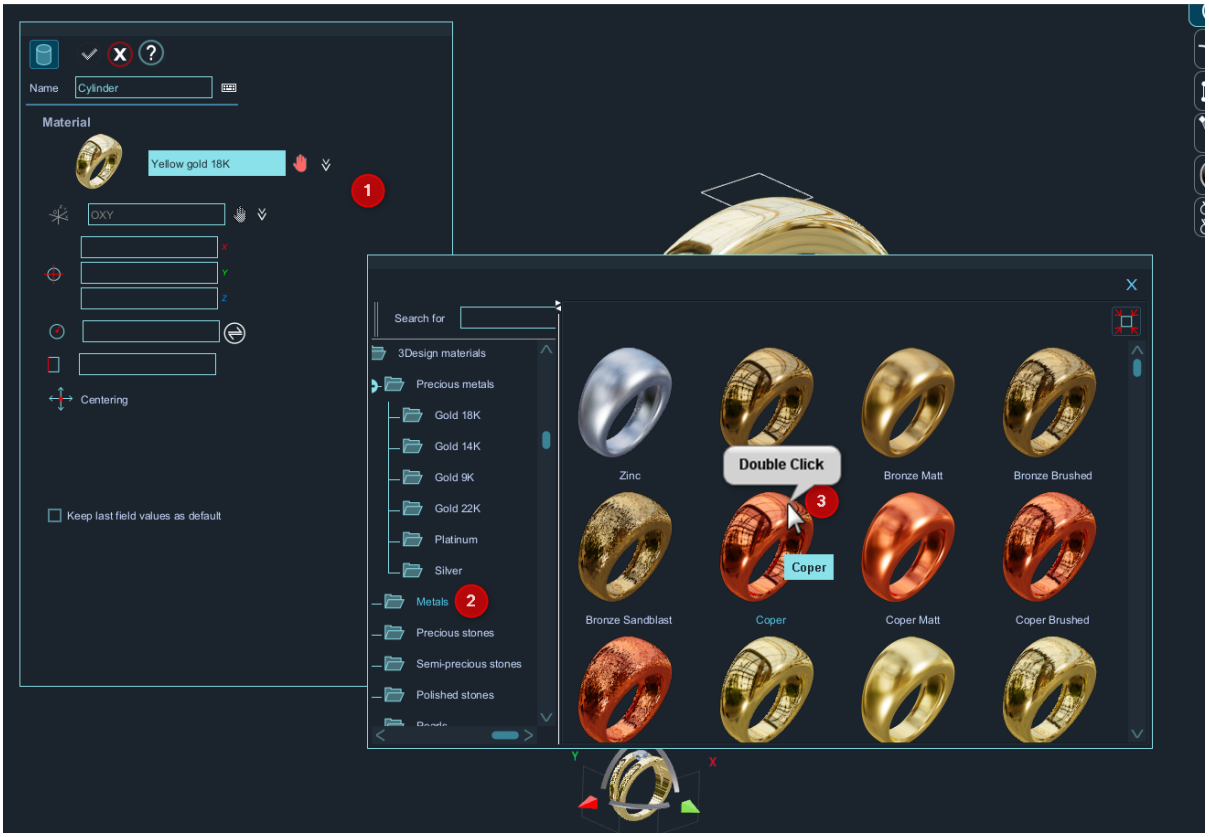
D. USING BOOLEAN OPERATIONS

The purpose of this chapter is to create an opening in the body of the ring to place the setting.

9. Select the **OXY plan**. Create a cylinder.

In the section Create solids tools  , open the Cylinder tool  .

(To make it clear that this cylinder is a tool, use for example **Coper** (Copper) as the metal)



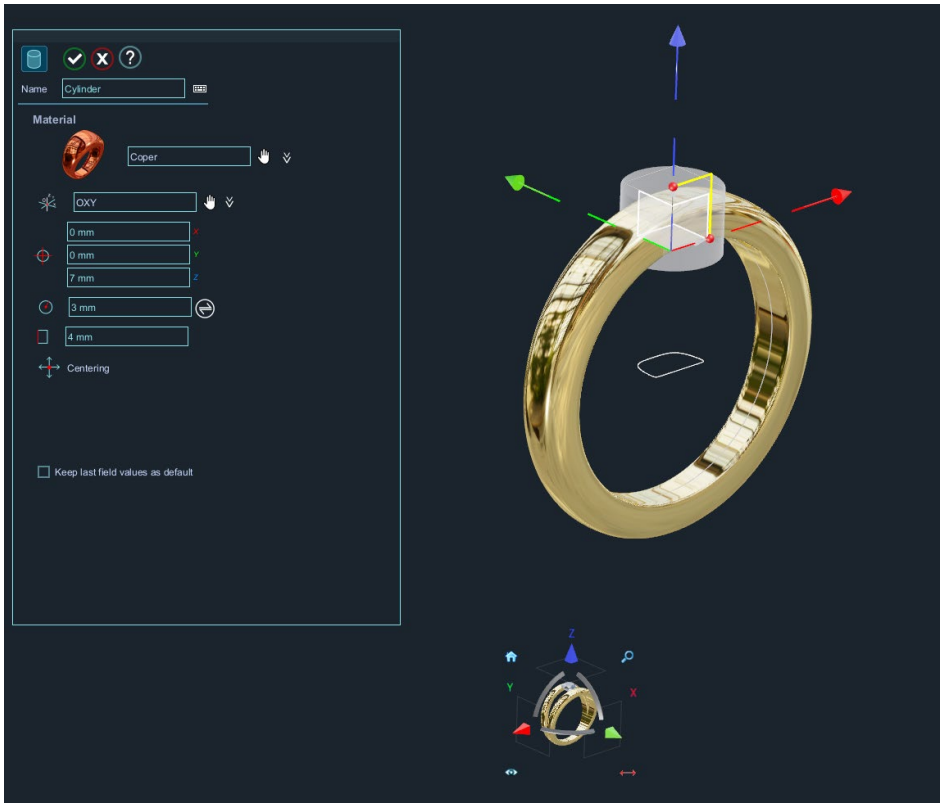
In the Properties window, set the following value:

Center X and **Y** to 0, **Z** to 7

("mm" is automatically entered)

Radius at 3

Height to 4



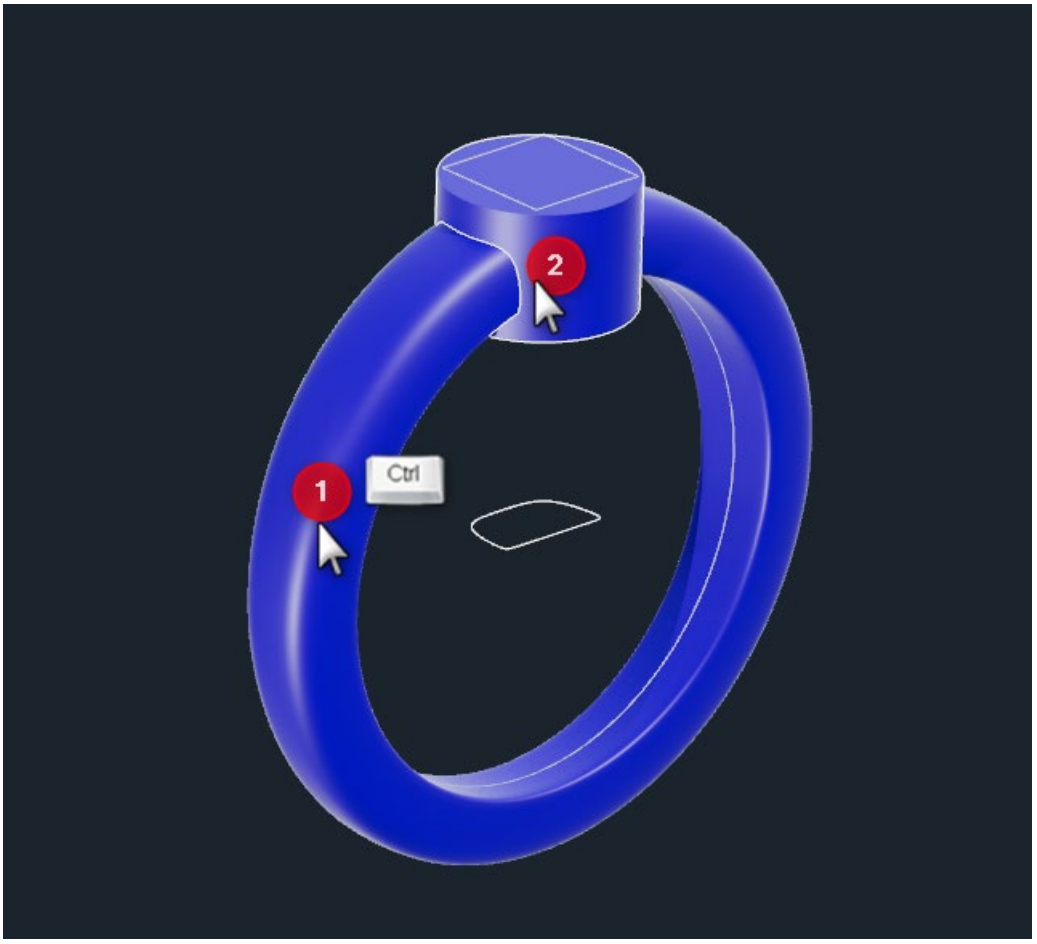
The cylinder is automatically placed in ***the correct position.***

Press the green checkmark .

Here, we work with **Boolean operations**, to remove the cylinder from the ring and to "drill" an opening in the ring to insert the setting.

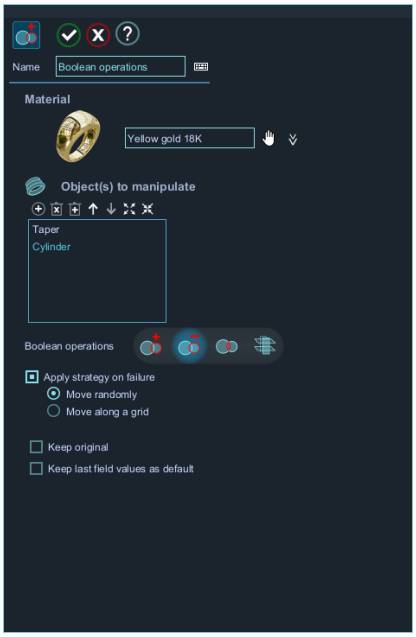
The various parts required for this operation have already been selected, i.e. the ring and the cylinder.

With the **Ctrl key pressed**, click on the ring (**Thread** in the tree) and then on **the cylinder**.



Open the **Boolean Operations** tool in the **Special Effects section**. In the Properties window, the parts that have already been selected will appear in the list of **Objects to be manipulated**.

Choose the **Subtract** function from the four possibilities of Boolean operations. The Properties window should look like this:



Press the green checkmark .

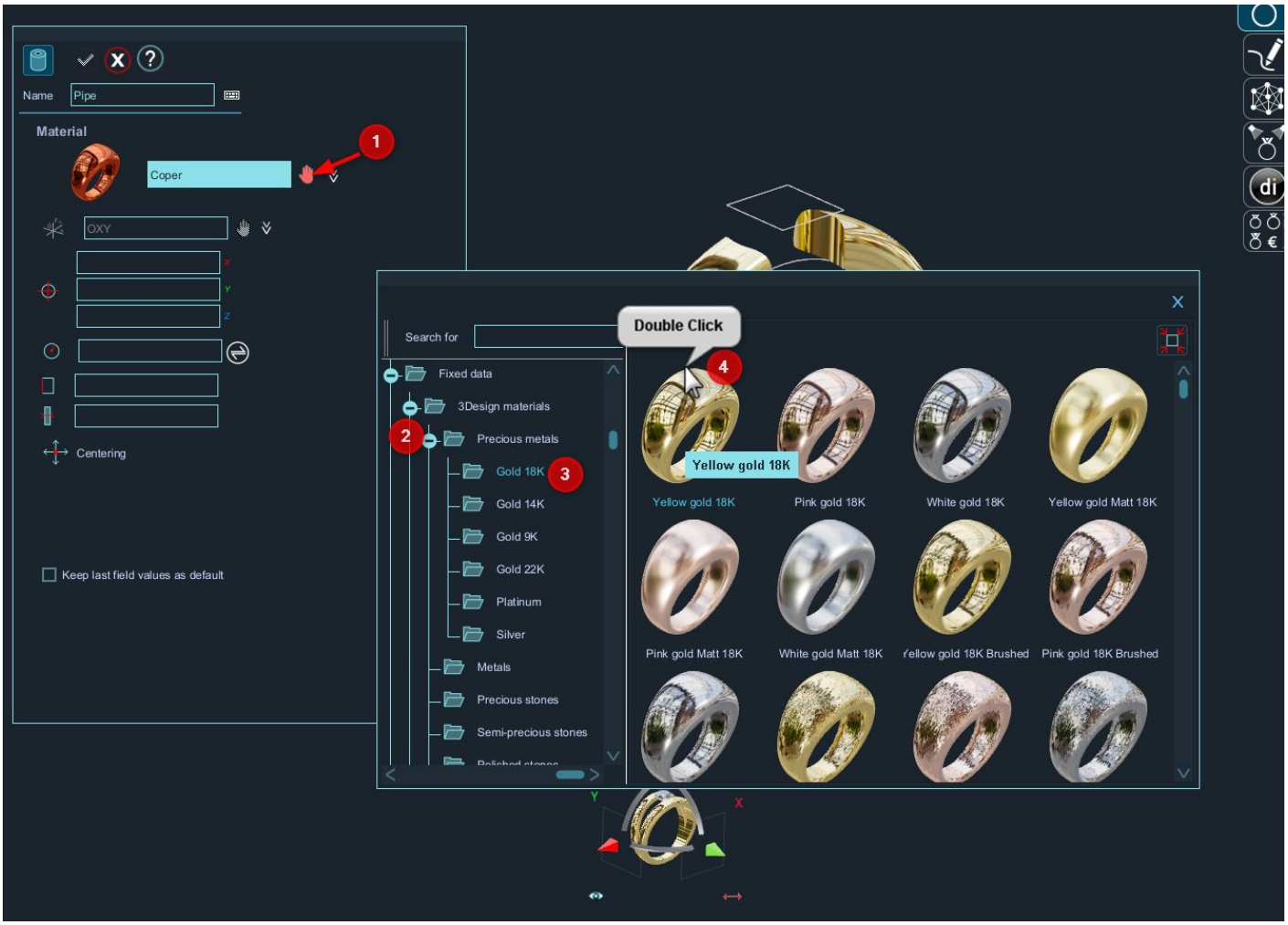
The main screen will then be displayed:

E. CREATE A SETTING

10. Select the **OXY plan**. Make a tube. In the  **Solid tools** section,

11. open the **Tube tool**  .

12. Change to Yellow gold 18K



In the Properties window, set the following values:

Center **X** and **Y** to 0. **Z** to 7 ("mm" is entered automatically).

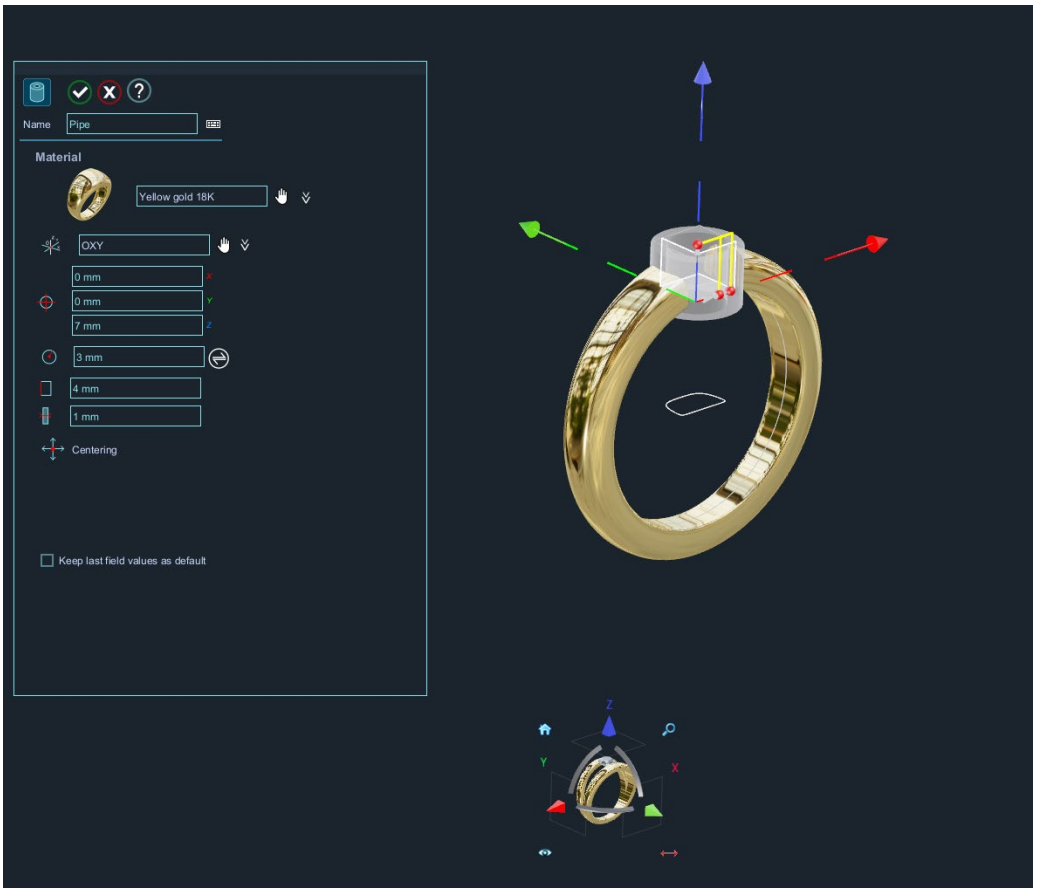
Radius at 3

Height to 4

Thickness at 1

The tube is automatically placed ***in the right place***.

In the main screen :

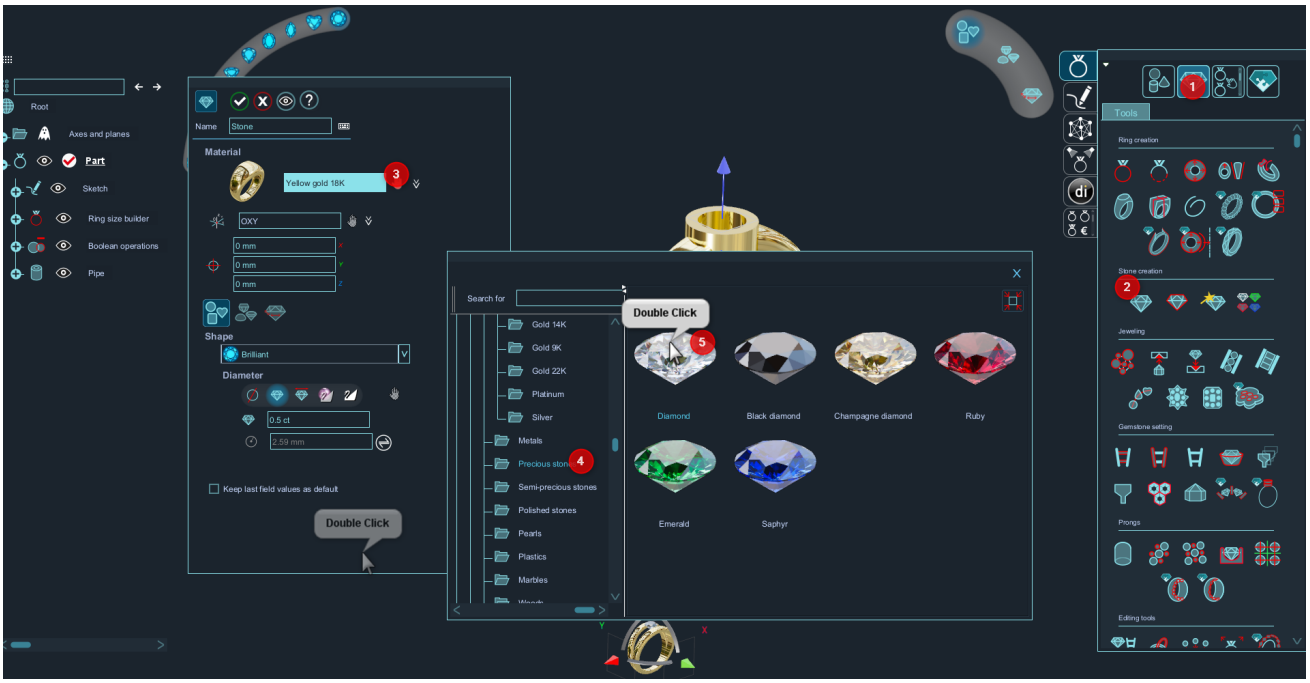


Press the green checkmark .

13. Click on **Jeweler's bench**  .

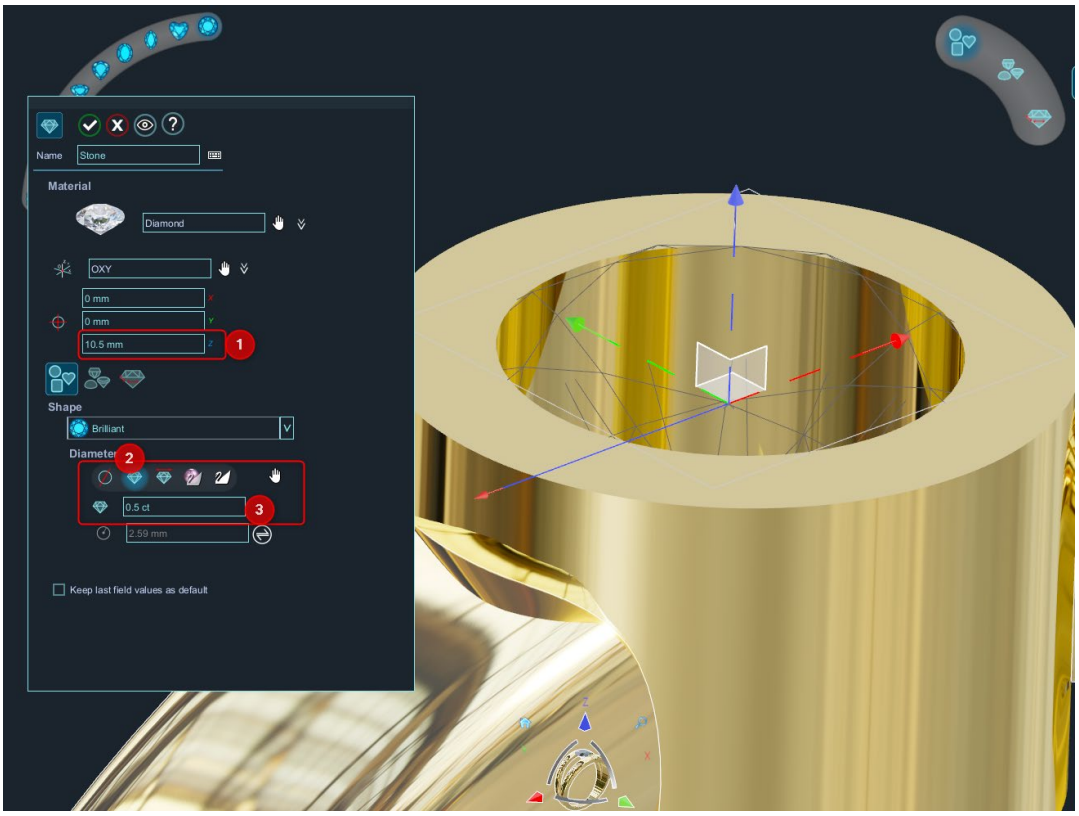
14. Open the **Stone Creation**  tool in the **Stone Creation section**.

Create a stone using Diamond as a material.



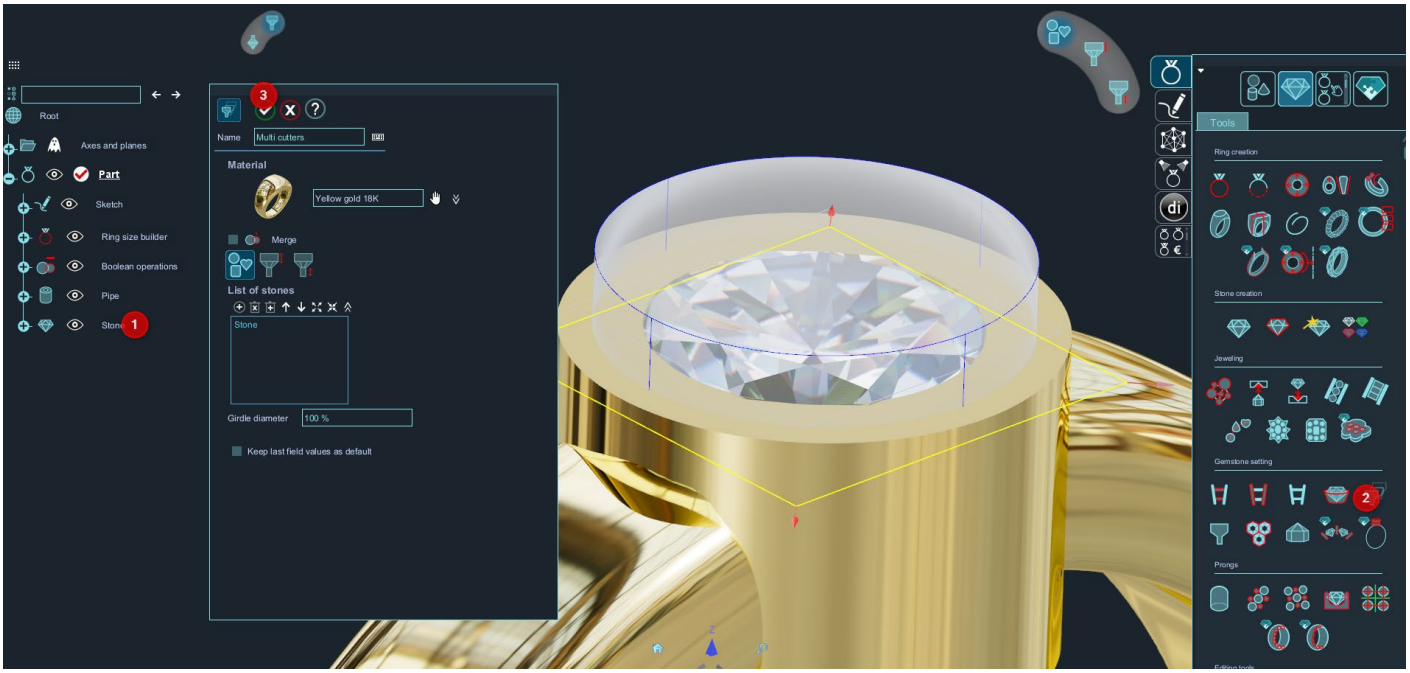
Set the **X** and **Y values** of the center to 0. **Z** to 10.5.

The size of the stone remains at 0.5 Ct. by default.



Press the green checkmark .

15. In order to match the stone to the setting, first select the created stone in the working window and click on the **multi cutters**  icon in the **Gemstone setting** section.



The drilling automatically adjusts to the size and position of the stone.

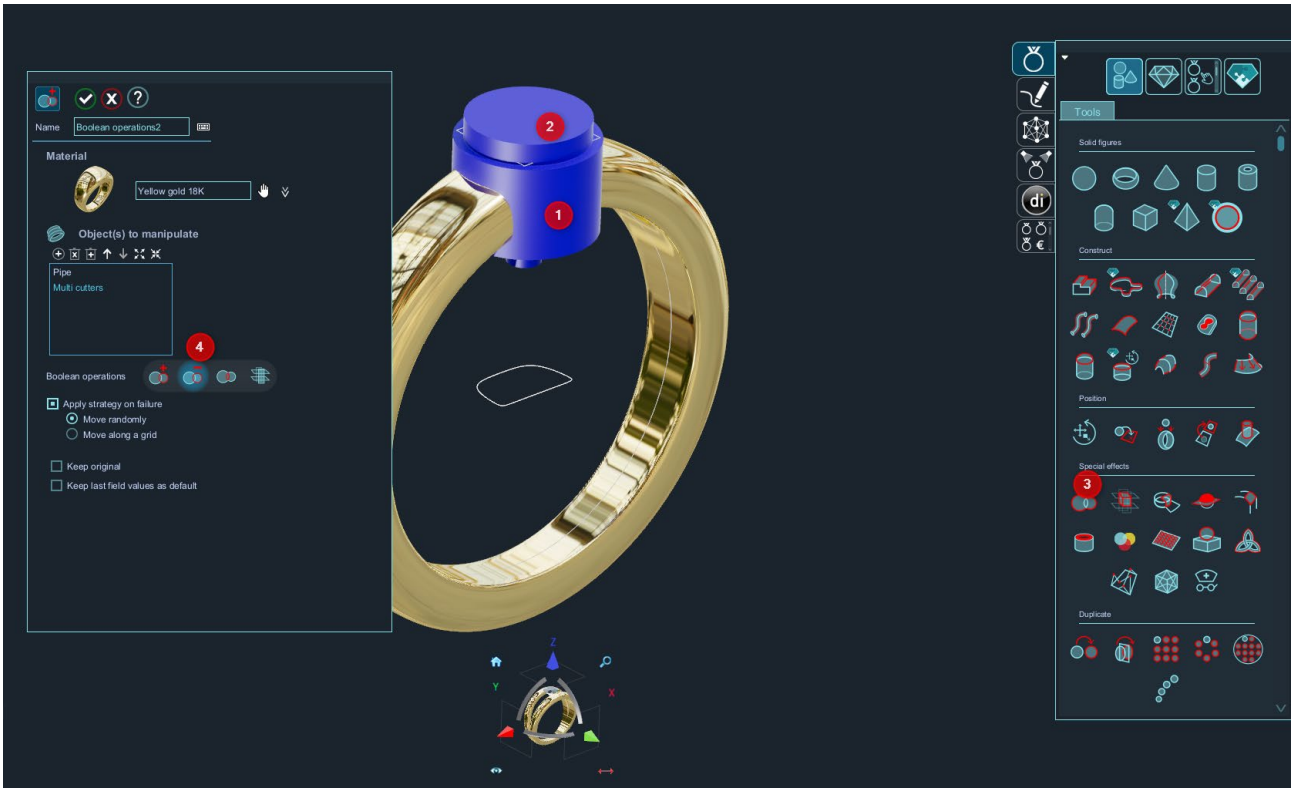
Press the green checkmark  .

16. Then select the created Tube **parameter** and the **previously created Multiple cutters** and click on the

Boolean Operation icon  (in Create solids )

Select the **Subtract option**  .

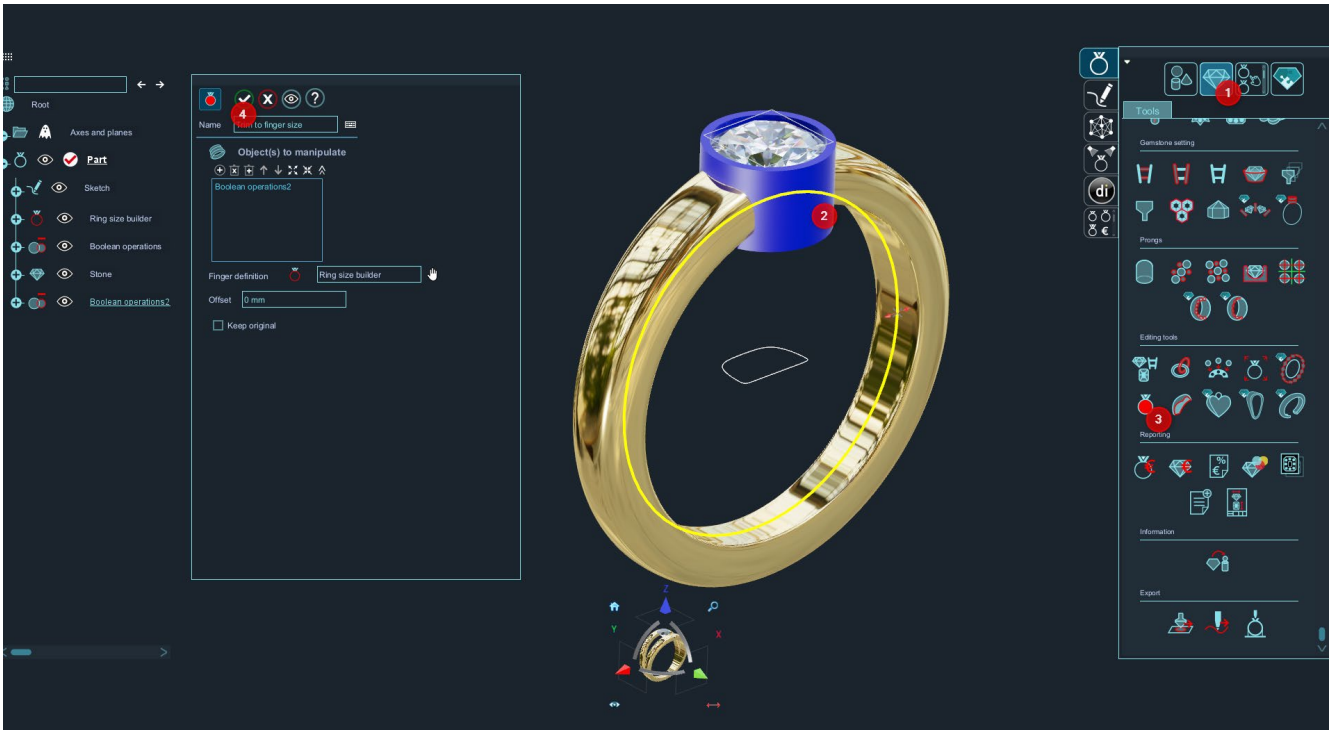
(Always make sure that the object you want to preserve is at the top of the Objects to Handle list



Press the green checkmark  .

17. To adjust the setting inside the ring, select the setting, go to **Jeweler's Workbench**  ,

18. and click Trim to finger size  .



Press the green checkmark  .