

# GO2cam V6.10 Tutorial M03 – Caliper



# Process for the Design

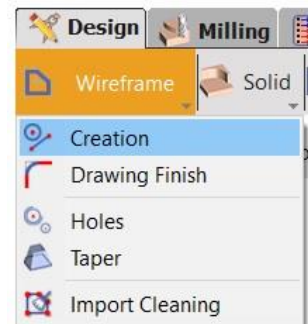
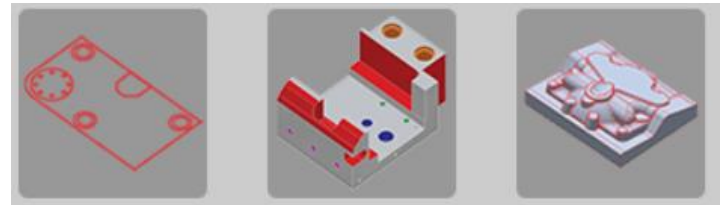
## 1. Choice of the Milling environment in the homepage:

- Left-click on the Milling icon that is rightmost on the image. This is the product containing the most options.



Note: the icons represent the type of product. If your licence do not include it, the product icon is greyed.

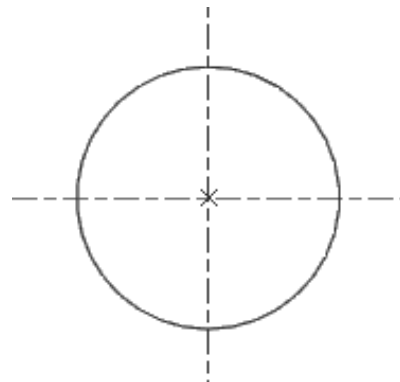
The software opens in Design mode by default

- Left-click on Wireframe
- Left-click on Creation




## 2. Creation of a circle

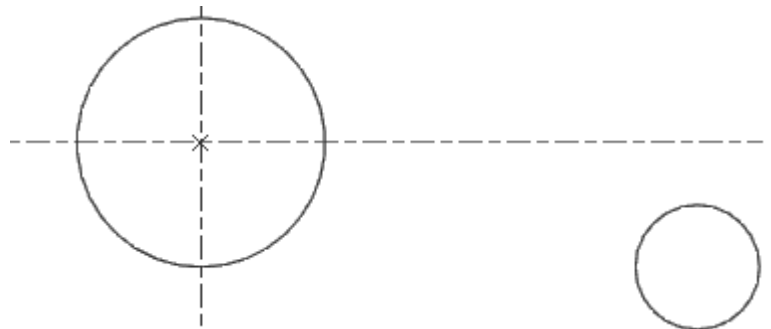
- Left-click on 
- Left-click on the origin of the axes mark (  )
- Type in the value of 20 (Radius), and ENTER



## 3. Creation of a second circle


With the  still active,.

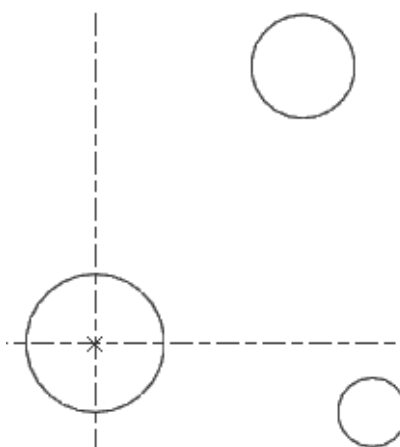
- Type 80 in X, -20 in Y
- Left-click on 
- Left-click in space
- Type a value of 10 (radius)







## 4. Creation of a third circle

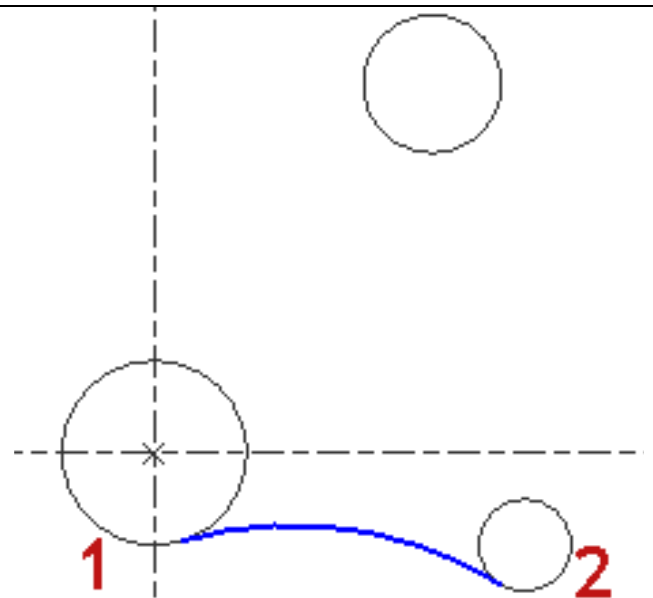
With the  still active,.

- Type 60 in X, 80 in Y
- Left-click on 
- Left-click in space
- Type a value of 15 (radius)







### 5. Creation of one arc

- Left-click on 
- Left-click under the circle 1 () then under the circle 2 ()
- Left-click in the space
- Switch to mode clockwise  CW
- Type value of 85 (Radius)

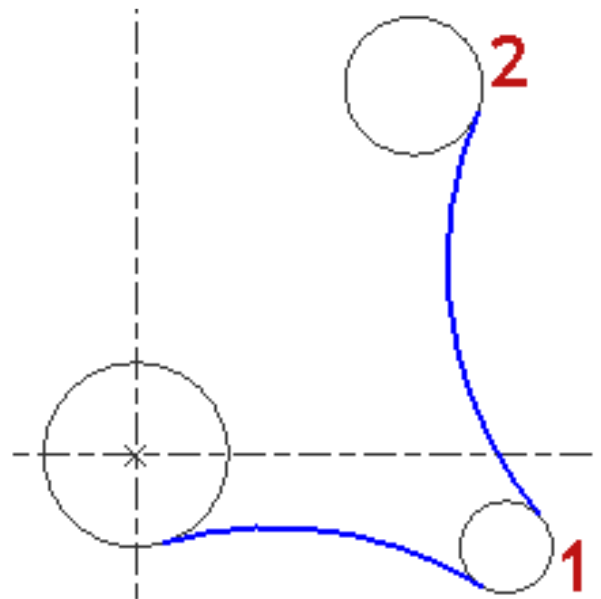


### 6. Creation of a second arc:




With the  still active.

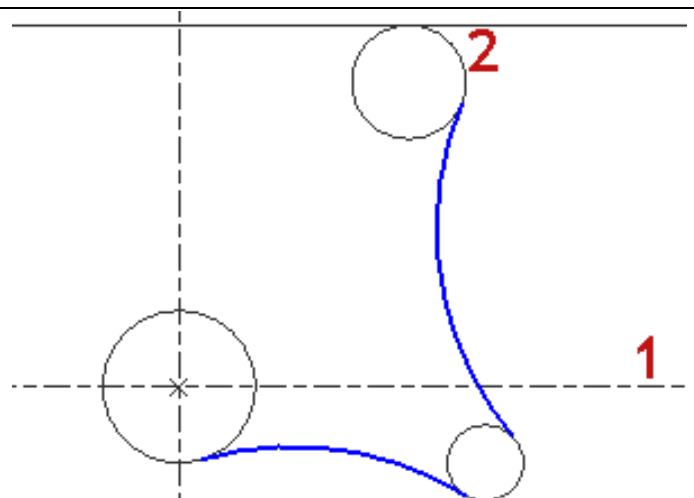
- Left-click on 
- Left-click under the circle 1 () then under the circle 2 ()
- Left-click in the space
- Switch to mode clockwise  CW

Type value of 85 (Radius)






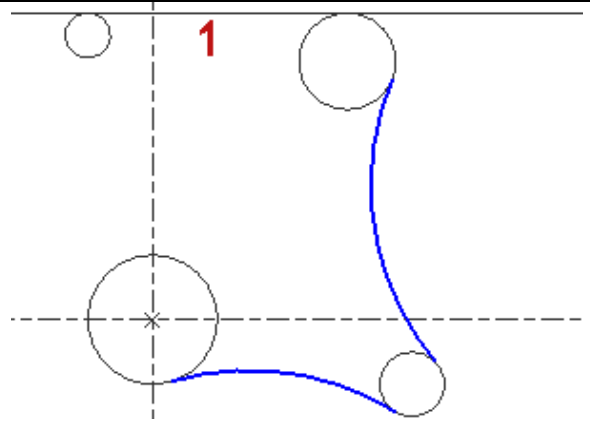
### 7. Creation of a line:

- Left-click on 
- Left-click on horizontal axis 1 ()
- Left-click on top of circle 2 ()






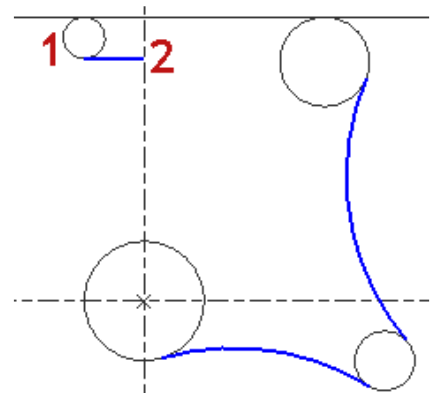
### 8. Creation of a circle tangent to a line:

- Left-click on 
- Left-click on the line 1 ()
- Type in the value -20 (X), and ENTER
- Type in the value 88 (Y), and ENTER
- Left-click on 



### 9. Creation of a segment :

- Left-click on 
- Left-click under the circle 1 ()
- Left-click on vertical axis 2 ()

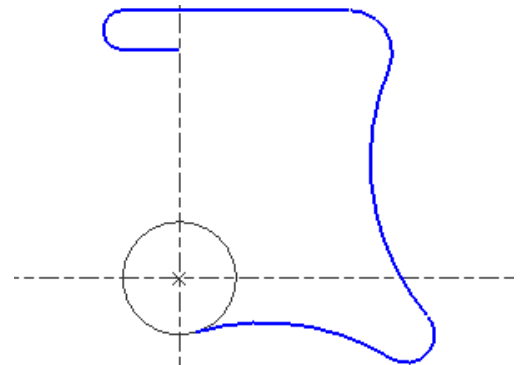


### 10. Final drawing:


- Left-click on 

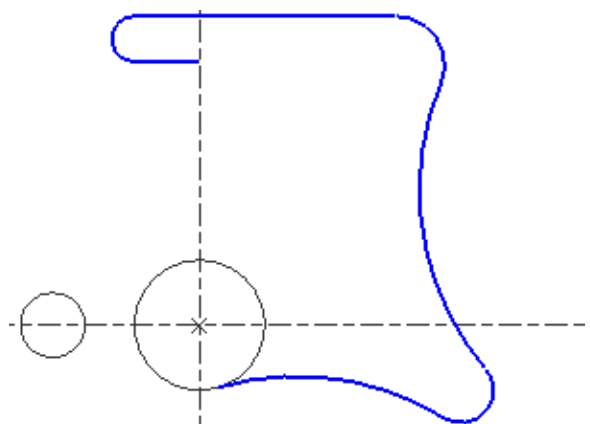
Note: You can preview the click result by moving the cursor on the elements.

- In this case, starting on the 3 circles, then on the horizontal line.






### 11. Creation of a circle

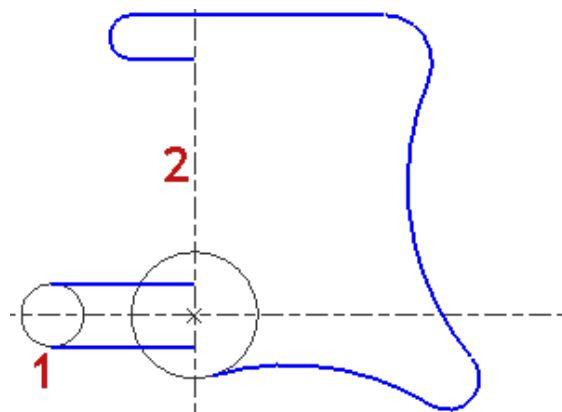
- Left-click on 
- Keep the CTRL key pressed. Define the circle's center using the grid; move your cursor on the horizontal axis and when you see the value -45 in zone DX and 0 in zone DY on top of the screen and left-click to apply the center.
- Keep the CTRL key pressed. We create the circle's radius using the grid again, at the value of 10.





### 12. Creation of 2 segments:

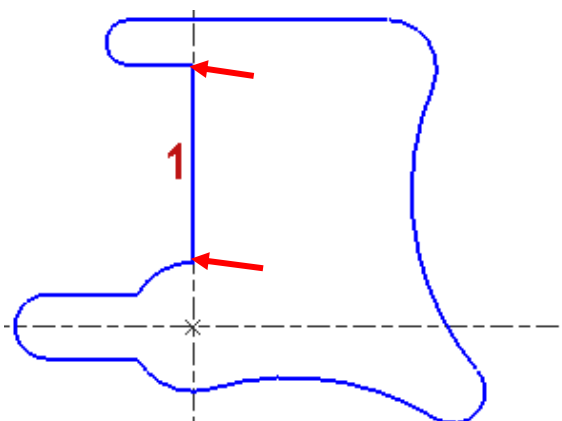
- Left-click on 
- Left-click under the circle 1 (  )
- Left-click on vertical axis 2 (  )
- Press the Escape key

Do the same for the 2<sup>nd</sup> segment on top of circle 1.





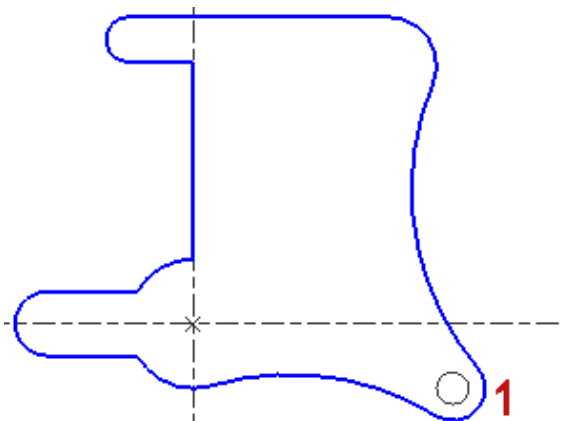
### 13. Finish of the outside shape:

- Left-click on 
- First, click two points at the end of the arrow to create element 1
- Left-click on 
- Then create the others elements by deleting useless fragments.





### 14. Creation of a concentric circle:

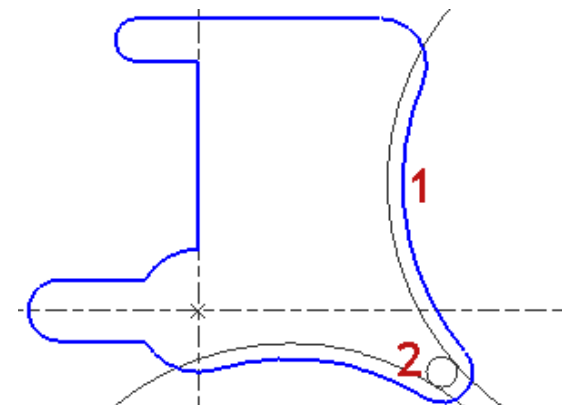
- Left-click on 
- Left-click on the arc of circle 1 (  ), the circle will be concentric (
- Left-click in space
- Type -5 in **Radius**






### 15. Creation of another concentric circle:

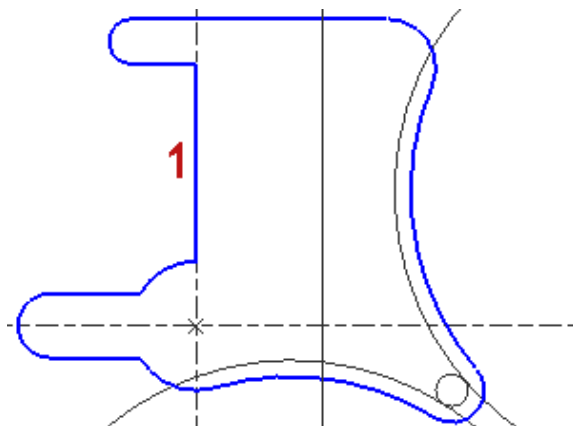
With the  still active.

- Left-click on cycle 1 (  )
- Left-click on right side of cycle 2 (  )
- Do the same for the third





### 16. Creation of a vertical line:

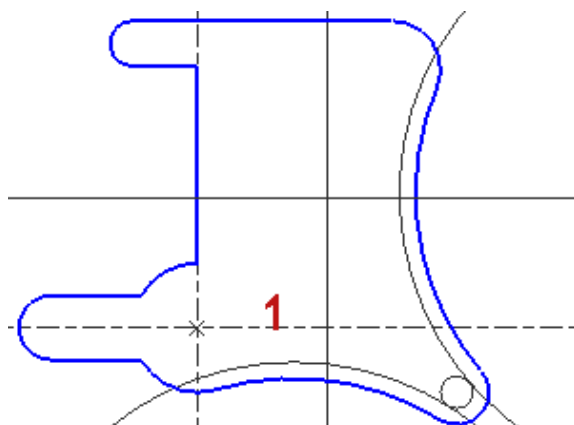
- Left-click on 
- Left-click on vertical axis 1 (   )
- Left-click on right side of axis
- Type in the offset value 40, and ENTER





### 17. Creation of a horizontal line:

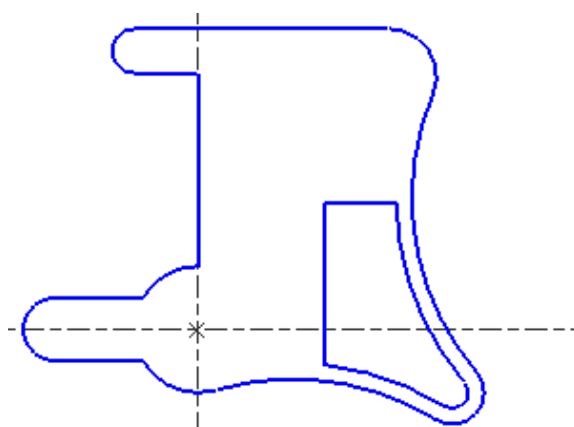
With the function  still active.

- Left-click on the horizontal axis 1 (   )
- Left-click above the axis
- Type in the offset value 40, and ENTER






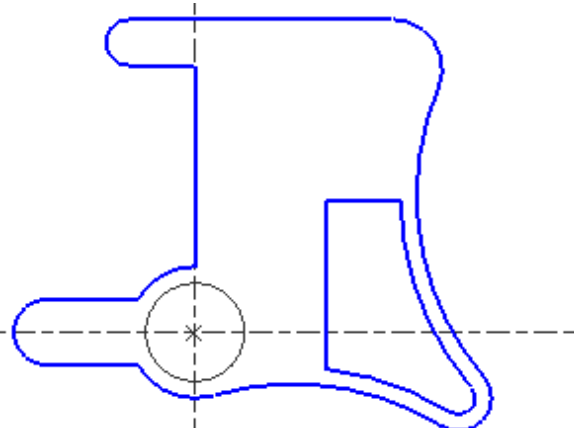
### 18. Finishing of the pocket:

- Left-click on 
- Keep the SHIFT key pressed and  on the elements to be kept : 2 segments and 3 arcs.



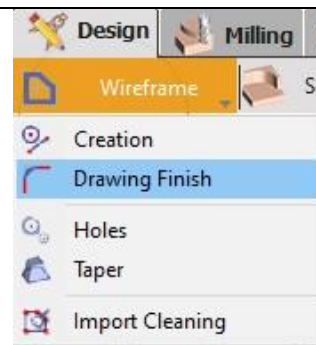
### 18. Creation of a predefined circle :

- Left-click on 
- Left-click on the center on the benchmark (   )
- Left-click in space
- Type value 30H8 (Diameter)





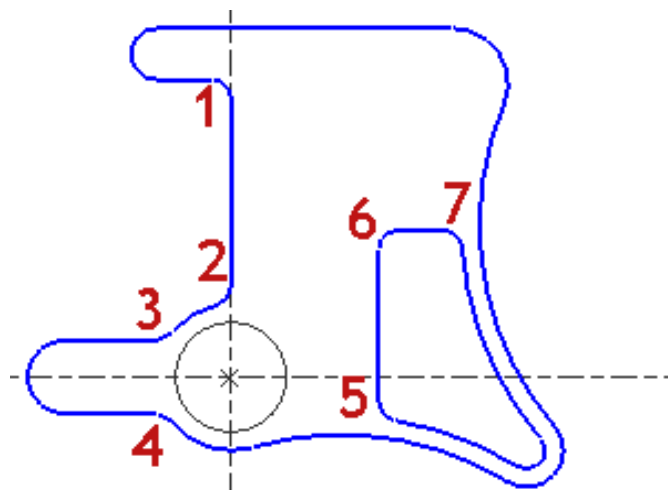
### 19. Change the menu:

- Left-click on Wireframe
- Left-click on Drawing Finish



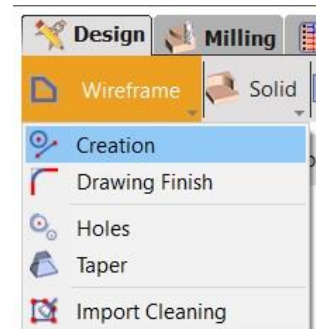
### 20. Creation of fillets:

- Left-click on 
- Type in the value 5 (radius), and ENTER
- Move the cursor next to the corners from 1 to 7 to visualize the right fillet.
- Left-click on  to validate.








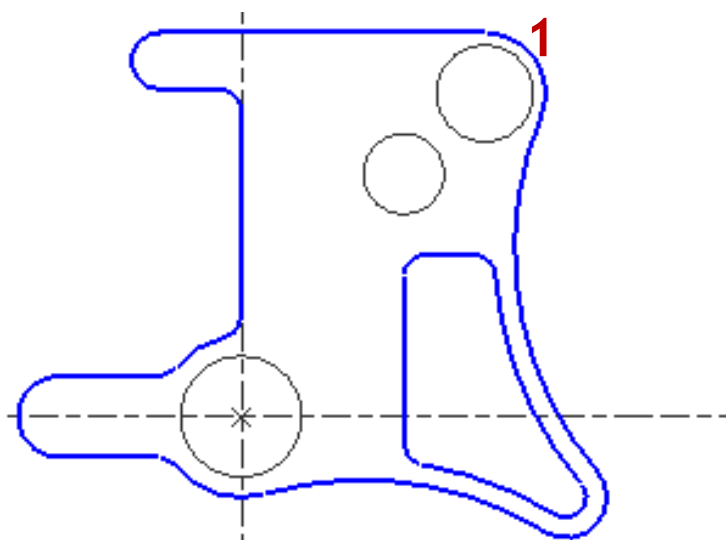
### 21. Back to Drawing menu

- Left-click on Wireframe
- Left-click on Creation




### 22. Draw an island :


- Left-click on  and select centre circle.
- Left-click on arc 1 (  )
- Left-click in space
- Type in the delta value -3, and 
- Left-click on 
- Type value 40 in X, 60 in Y
- Left-click on 
- Type value 10 (Radius)





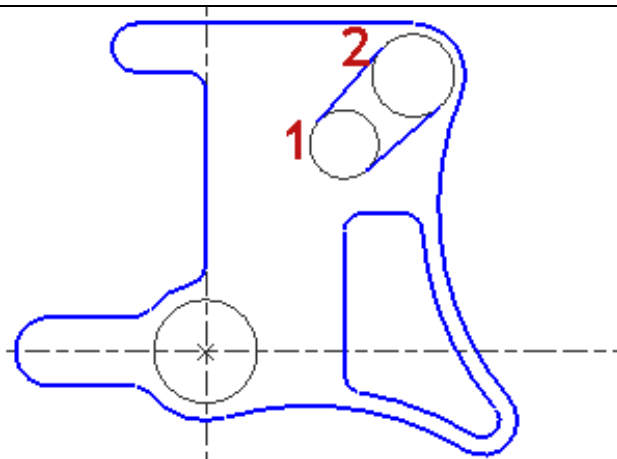
- Left-click on 

- Left-click on left of cycle 1 (  )


- Left-click on left of cycle 2 (  )

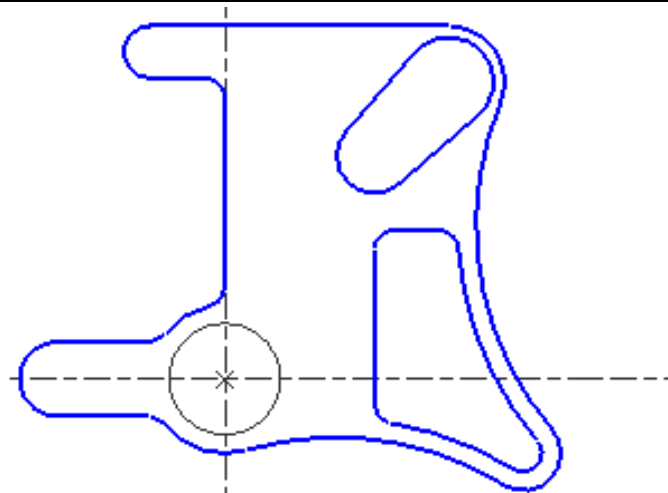
- Press Escape

- Perform the same operation for the second segment to the right of the 2 circles.









### 23. Finishing of the island:

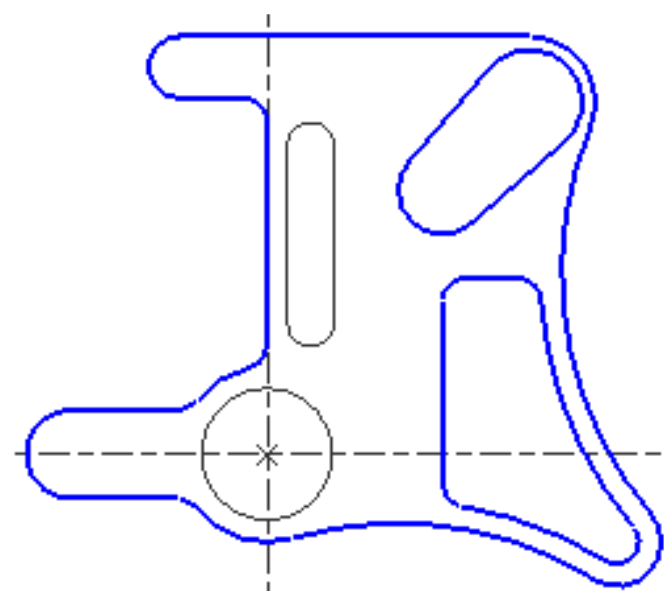
- Left-click on 
- Left-click on the arcs "to be canceled" by respecting what the cursor indicates



### 24. To create an oblong:

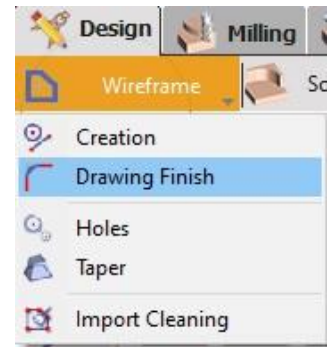
- Left-click on 
- Type value 10 in X, 30 in Y
- Left-click on  Then roughly locate the second point and diameter
- Left-click in Length field, then type 40
- Left-click in Angle field, then type 90
- Select Width, then type 11 and validate.

Length:	40.000 mm	
Width:	11.000 mm	
Radius:	5.500 mm	
Angle:	90.00 deg	




## 25. Change menu :








- Left-click on **Wireframe**
- Left-click on **Drawing Finish**

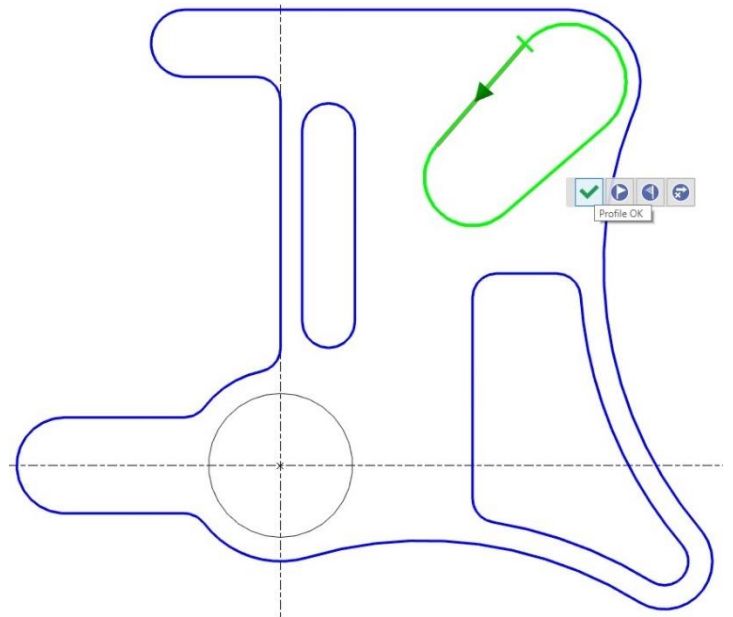


## 26. Create parallel profile:

- Left-click on 
- Fill in the menu in this way :

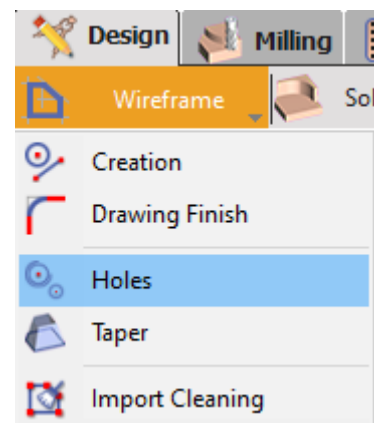
Side: Inside/Left  
Link: Chamfer  
Number: 1  
Offset 1: 2.000 mm  
Curve decomposition: into arcs and segments  
Tolerance: 0.100 mm  
☒ Validate ☐ Cancel

- Left-click on an element of profile
- Left-click on **Closed Profile**  
Click the ending element or  
     
- Left-click on **Profile OK** 
- **Validate**



## 27. Change menu :

- Left-click on **Wireframe**
- Left-click on **Holes**

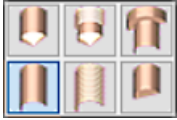


## 28. To create 2 holes Ø6:

- Left-click on Standard Holes





- Left-click on Type of hole
- Left-click on Through smoothed hole

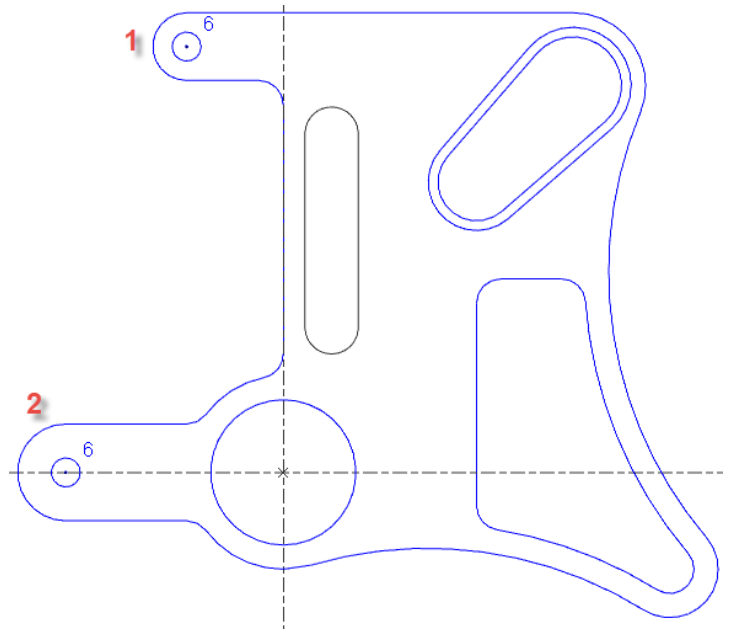


- Left-click twice in the field Diameter and then type value 6

Diam. :

- Left-click on arc 1 (  ) and Press Ctrl+Shift, the holes will be concentric

- Left-click on arc 2 (  ) and Press Ctrl+Shift, the holes will be concentric



# 1. Process for the Machining

## Milling :

- Left-click on Milling tab

The stock is automatically created in relation to the geometry.  
It is a parallelepipedal stock defined with a constant 5 mm overflow around the profile.

Stock modification:

- Left-click twice in **Zmini** then type -20
- Left-click twice in **Zmaxi** then type 20




## Opé 10 Facing with island

### 1. Start:

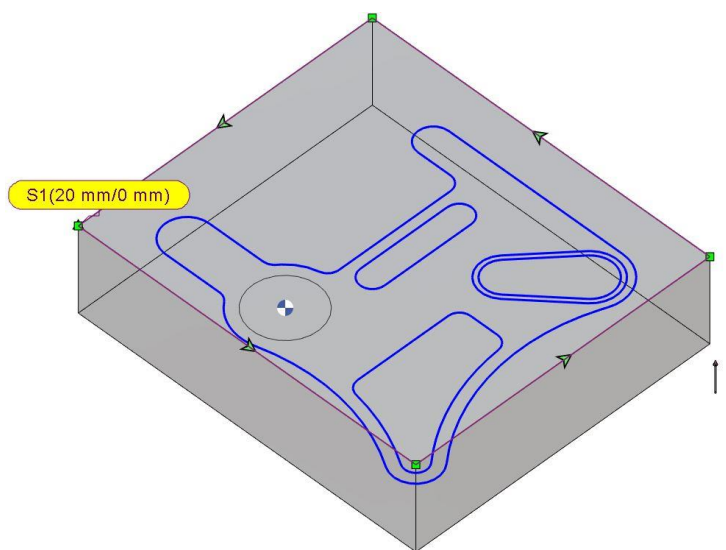
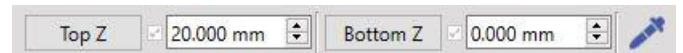
- Left-click on menu **Standard**



### 2. Selection of geometry:

- Left-click on 
- Select the stock
- Left-click on **top Z** (milling start height), then Left-click on top of stock, **GO2cam** reads and displays the value 20
- Left-click twice in the field bottom **Z**(milling end height) the type 0

**Note:** A number label will appear on the selection and indicate the height.

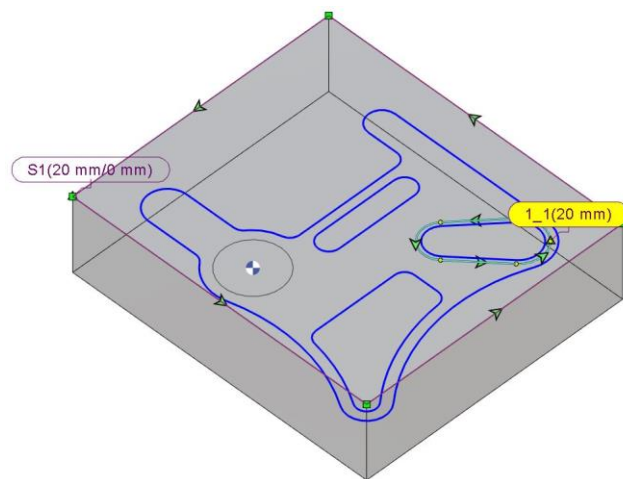


### 3. Island addition:

Profile selection mode is still active.

- Left-click on Outline of the island 1 (Select External Profile).

**Note:** GO2cam automatically reads and displays the value 20.



### 4. Tool selection:



- Left-click on
- Left-click on Square Shoulder Face Mill
- Left-click twice in Diameter and type 40

The light remains orange because the tool is not listed



Square Shoulder  
Face Mill

Tool name	Diameter	Useful length
	40.000 ...	30.000 mm

### 5. Machining cycle selection:



- Left-click on
- Left-click on Facing Pocket



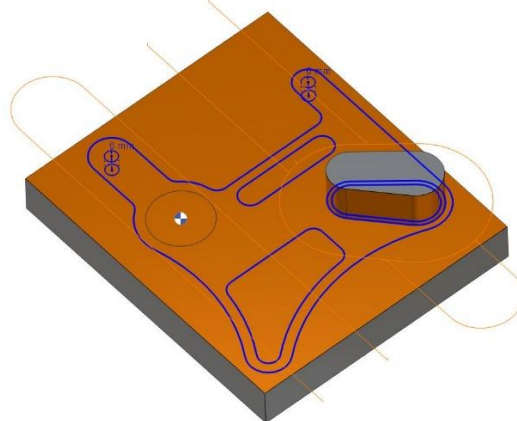
### 6. Modification of strategy parameters:

- Right-click on Facing Pocket
- Select strategy
- In the strategy setting, switch the contouring mode to "after"



### 7. Toolpath calculation:


- Left-click on Cycle Calculation



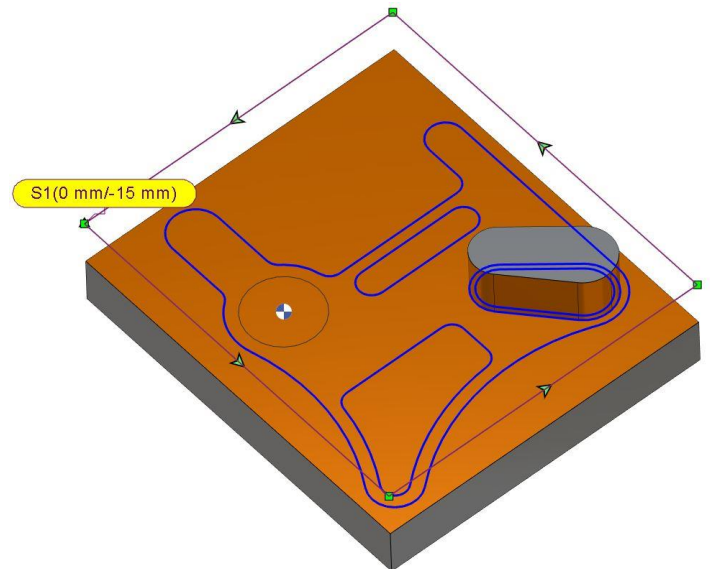
## Opé 20 Contouring of Shape

### 1. Selection of geometry:

The menu  **Standard** is still active.

- Left-click on  then click on the stock
- Check the box of top z, Left-click twice in the field and type 0
- Left-click twice in the field of bottom Z and type -15

Top Z ☒ 0.000 mm Bottom Z ☒ -15.000 mm

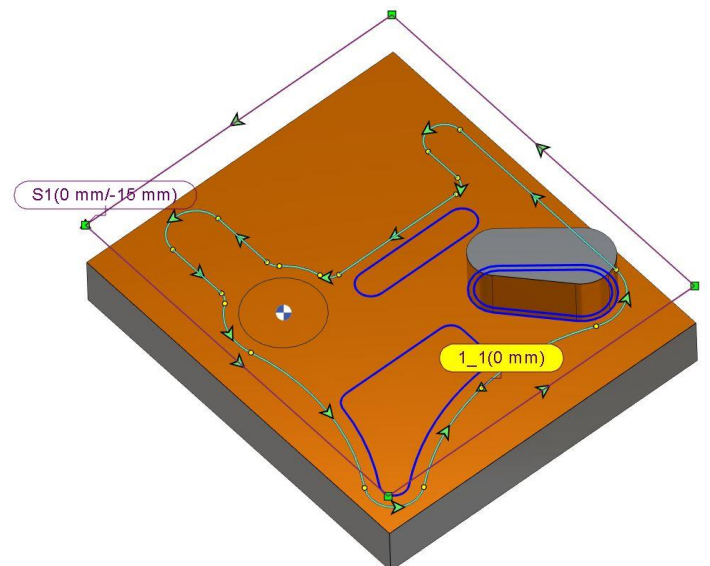


### 2. Island addition:

The outer profile contour is considered as an island here.

- Left-click on Exterior profile of the Caliper
- Check the box of top z, Left-click twice in the field and type 0

Top Z ☒ 0.000 mm



### 3. Tool selection:

Left-click on 


Left-click on **Flat End Mill**

Automatic creation of Ø10 milling cutter  
The light remains orange because the tool is not listed



Tool name	Diameter	Useful length
	10.000 ...	70.000 mm

### 4. Machining cycle selection:

- Left-click on 
- Left-click on **Pocket**



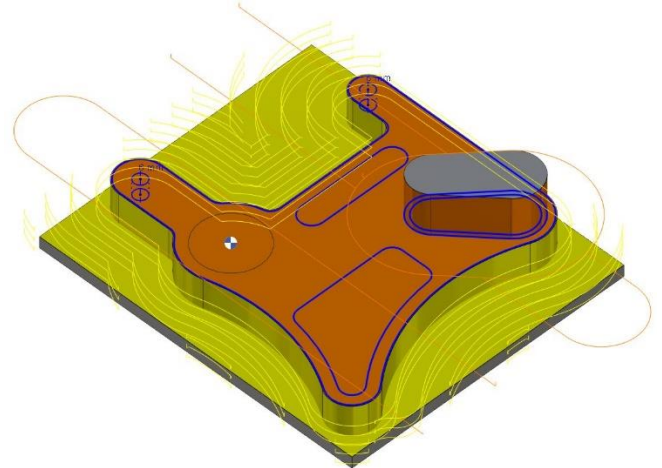
Pocket



- In the Pocket strategy setting, switch the processing method to "start by the sides"
- In **Movement** settings, change retract altitude to **Rapid Plane**

Machining Method ☐ End by the sides  
☒ Start by the sides  
☐ Snail

Retract altitude  
 Rapid plane



## 5. Toolpath calculation:

- Left-click on Cycle Calculation



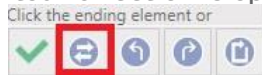
## Opé 30 Finish contour milling

### 1. Selection of geometry:

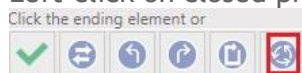
- Left-click on the menu Manual
- Left-click on
- Left-click on profile 1. A cross shows the starting point

An arrow indicates the machining direction, it must respect the strategy "tool on the left of profile".

- If the contour direction is opposite, Left-click on



- Left-click on closed profile

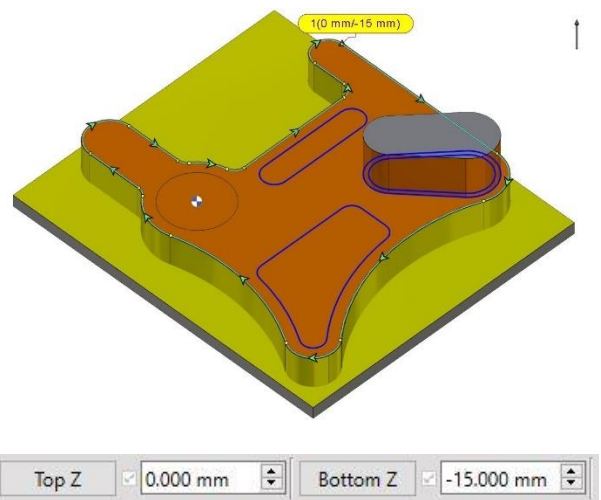
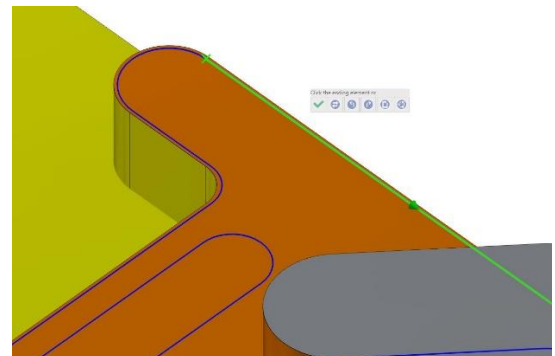


- Left-click on profile OK




- Check the box top Z, Left-click twice in the field and type 0

- Left-click twice in bottom Z and type -15



Top Z ☒ 0.000 mm Bottom Z ☒ -15.000 mm

## 2. Tool selection:

- Left-click on 
- Left-click on **Flat end mill**


Automatic creation of Ø 10 milling cutter



Flat End Mill

Tool name	Diameter	Useful length
	10.000 ...	70.000 mm

## 3. Machining cycle selection:

- Left-click on 
- Left-click on **Contouring**
- Modify the value of **Lead in arc radius** and **Lead out arc radius** to 5

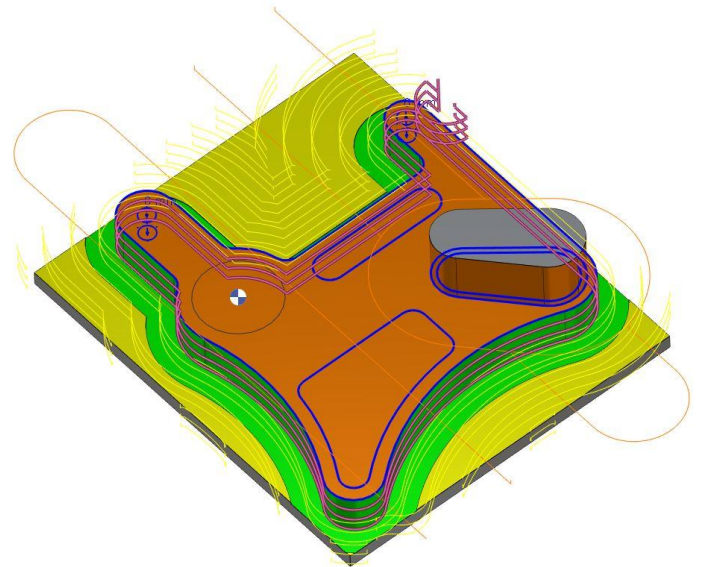


Contouring

Techno. name	Z Step (Ap)	Offset	Toolpa	Lead in arc radius	Lead out arc radius	allowance	allowance
	5.000 mm	Left ▾	Part ▾	5.000 mm	5.000 mm	0.000 mm	0.000 mm

## 4. Toolpath calculation:

- Left-click on Cycle Calculation 

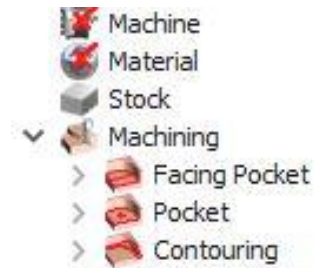




## Opé 40 Finishing of island

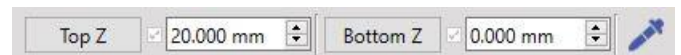
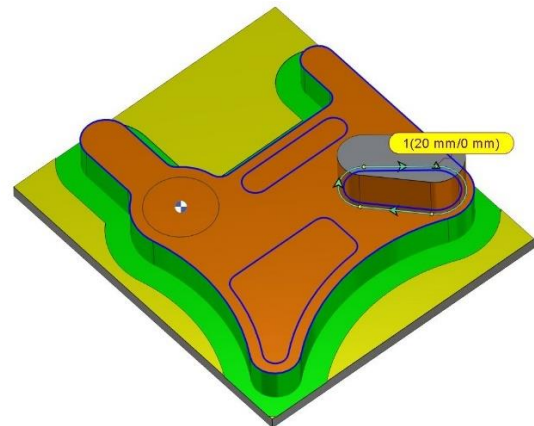
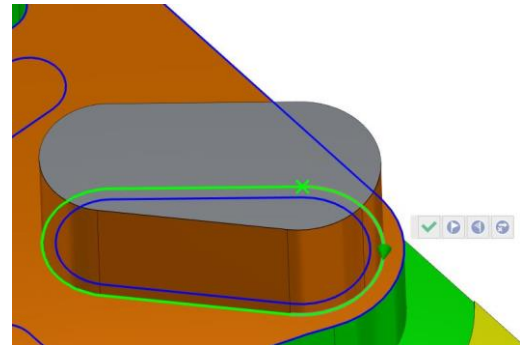
### 1. Start:

- Left-click on 
- Left-click on the cycle **Contouring** in the machining tree: you can now select the same machining strategy to apply it on another shape.



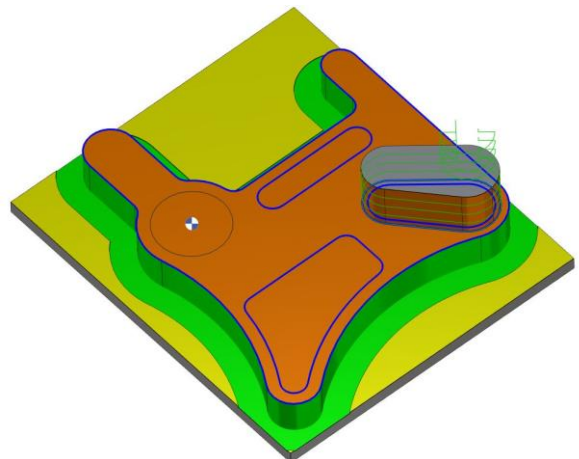
### 2. Selection of geometry:

- Left-click on 
- Left-click on the island profile (for the starting element).
- If the contour direction is opposite, Left-click on 
  - 
  - 
  - 
  - 
  - 
- Left-click on close profile 
  - 
  - 
  - 
  - 
  - 
  - 
- Left-click on profile OK 
- Left-click on Top Z, then Left-click on the top of stock
- Left-click twice on **bottom Z**, type 0



### 3. Toolpath calculation:

- Left-click on Cycle Calculation 



# Modification of a cycle

## 1. Use of machining tree:

The machining tree is a working tool that allows:


- To obtain a series of manufacturing information during your operation, including all relevant information
- To modify operations data (selected geometry, technology, tools)
- Cycle manipulations: copy, move machining cycles

Editing a cycle for modification :

It can be noted that the pocketing cycle leaves extra thickness at Z

We will change this parameter to remove this thickness at Z.

There are 2 possible solutions :

- Left-click on arrow  in front of the cycle name, so you can edit the required steps or
- Left-click twice on cycle name, edit the whole cycle

Therefore, you can access the 3 steps defined for each cycle :

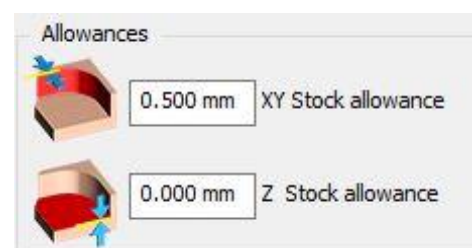
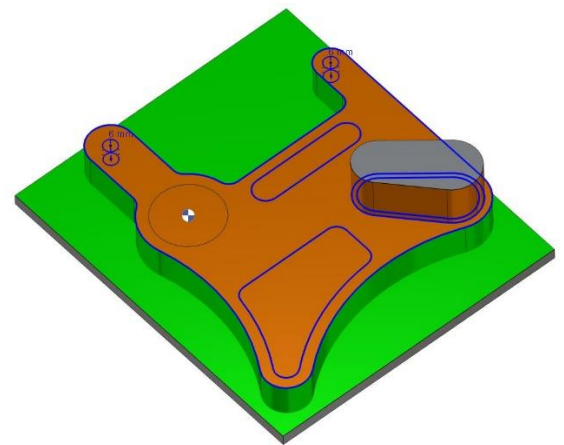
- Geometry Selection
- Choice of Tool
- Choice of Strategy

- Left-click twice on **Pocketing**

This strategy page contains all parameters related to tool path calculation.



- Left-click twice in Z stock allowance, type 0
- Left-click on execute button at the top of the dialog box

The cycle is automatically recalculated.

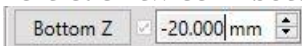



## Opé 50 Machining of Pockets

### 1. Selection of geometry:

- Select mode  Standard
- Left-click on  then click on the three profiles of the pockets.

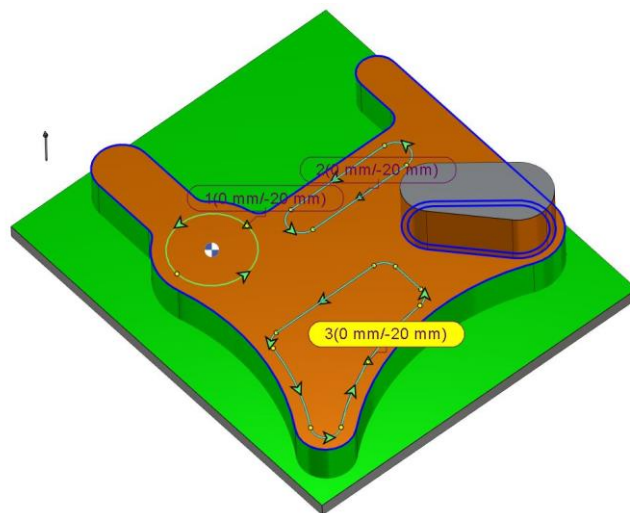
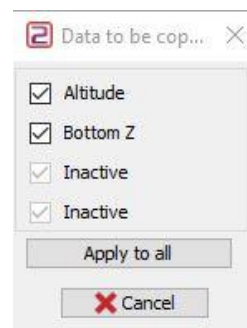
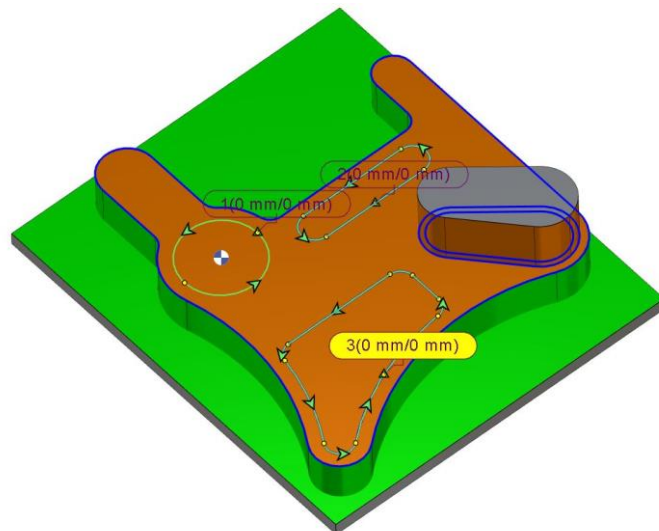
For the three pockets, the Bottom Z value is zero. We will modify one of the profiles and apply its value to the other two profiles.

- Left-click twice in bottom Z , type -20  

- Left-click on the icon  in the window


It opens a window that allows you to set the height that will be applied to other pockets.

- Left-click on “Apply to all”

All heights are now defined appropriately.









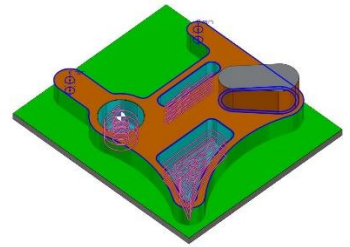
### 2. Tool selection:

- Left-click on 
- Left-click on **Flat end mill**
- Left-click and select a Diameter 9 tool.




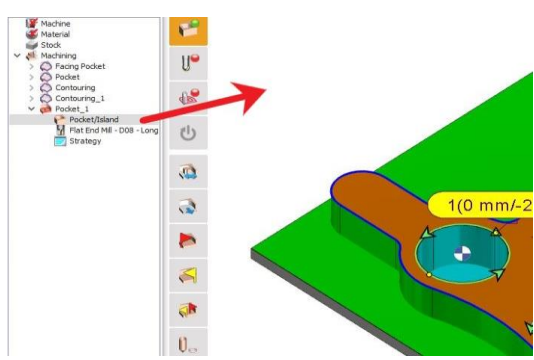
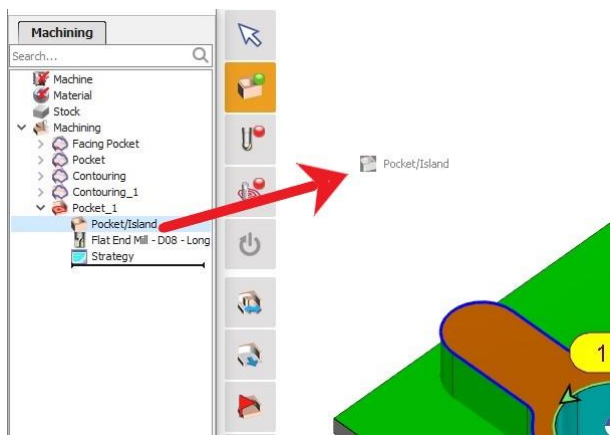




### 3. Machining cycle selection:


M03-18

<ul style="list-style-type: none"> <li>Left-click on </li> <li>Left-click on <b>Pocket</b></li> <li>In the pocket strategy setting, change the Stepover(Tool ratio) to 0.7</li> </ul>	 <p>Pocket</p> <table border="1"> <thead> <tr> <th colspan="2">Stepover Calculation</th> </tr> </thead> <tbody> <tr> <td></td> <td>0.7000 Stepover (Tool ratio)</td> </tr> <tr> <td></td> <td>8.400 mm Stepover value (Ae)</td> </tr> <tr> <td></td> <td>0.000 mm XY Scallop</td> </tr> </tbody> </table>	Stepover Calculation			0.7000 Stepover (Tool ratio)		8.400 mm Stepover value (Ae)		0.000 mm XY Scallop
Stepover Calculation									
	0.7000 Stepover (Tool ratio)								
	8.400 mm Stepover value (Ae)								
	0.000 mm XY Scallop								
<p>4. Toolpath calculation:</p> <ul style="list-style-type: none"> <li>Left-click on Cycle Calculation </li> </ul>									

## Opé 60 Pocket Rework

<p>1. Selection of geometry:</p> <ul style="list-style-type: none"> <li>The mode  <b>Standard</b> is still active</li> <li>Left-click on </li> <li>In the machining tree Left-click on the arrow in front of the cycle name [Pocket_1]</li> <li> Click and drag the "pocket/island" geometry of pocket operation to the window</li> </ul> <p>The profile and height of the pocket operation will be copied into the new operation.</p> <p><b>Note:</b> This operation can also be used to copy tools or strategies.</p>	 
<p>2. Tool selection:</p> <ul style="list-style-type: none"> <li>Left-click on </li> <li>Left-click on <b>Flat end mill</b></li> <li>Left-click and select a Diameter 8 tool</li> </ul>	 <p>Flat End Mill</p>

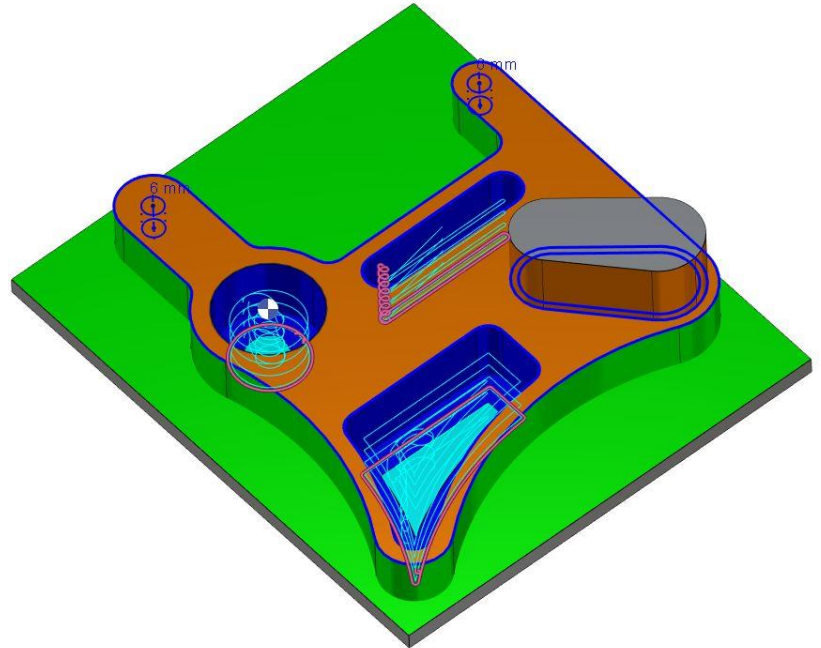
### 3. Machining cycle selection:

- Left-click on 
- Left-click on **Pocket rework**
- In the strategy setting, change the reference diameter to 8 and the allowance to 0.2



### 4. Toolpath calculation:

- Left-click on Cycle Calculation





## Opé 70 Pocket Finishing

### 1. Selection of geometry:

- Left-click on the menu

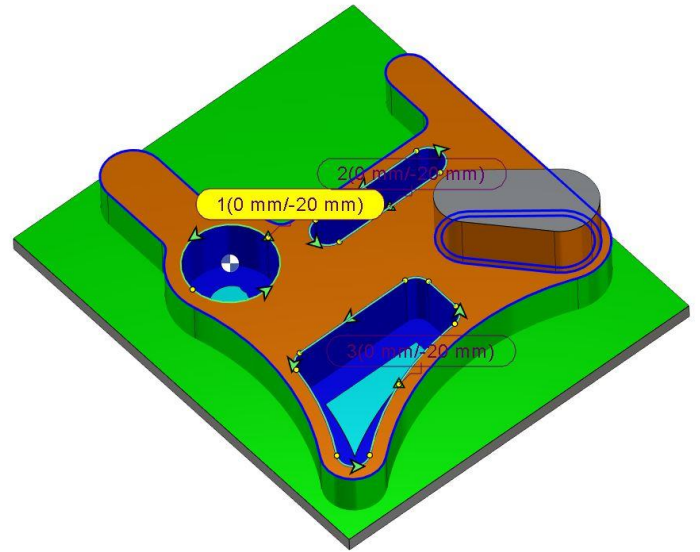


- Left-click on



- Click and drag the pocket/island geometry of the last pocket rework operation to the window.

The profile and height of the pocket rework operation will be copied into the new operation.




### 2. Tool selection:

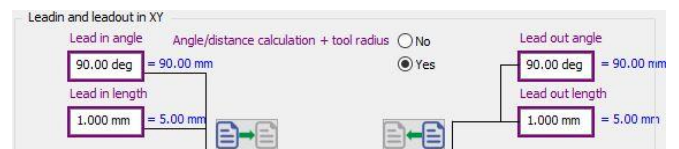
- Click and drag the Pocket Rework tool to enter the window.

The tool of pocket rework operation is now copied to this new operation.



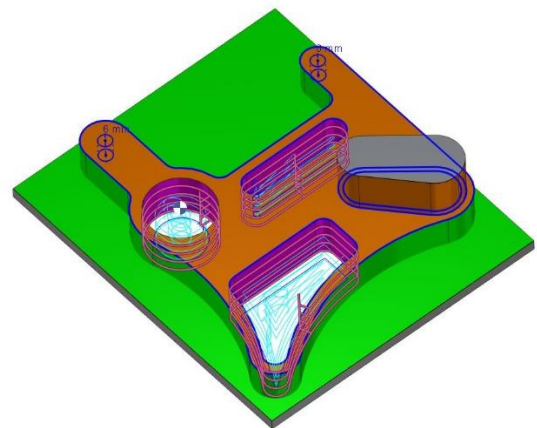
### 3. Machining cycle selection:

- Left-click on
- 
- Left-click on **Contouring**
  - In the Movement window, change the lead in length and lead out length to 1 in the movement settings



### 4. Toolpath calculation:

- Left-click on Cycle Calculation



## Opé 80 Slotting of island

### 1. Selection of geometry:

- Left-click on the menu

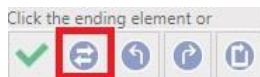


- Left-click on

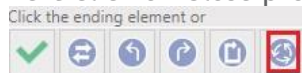


- Left-click on the profile as per the image on the right.

- If the contour direction is opposite, Left-click on



- Left-click on Close profile



- Left-click on



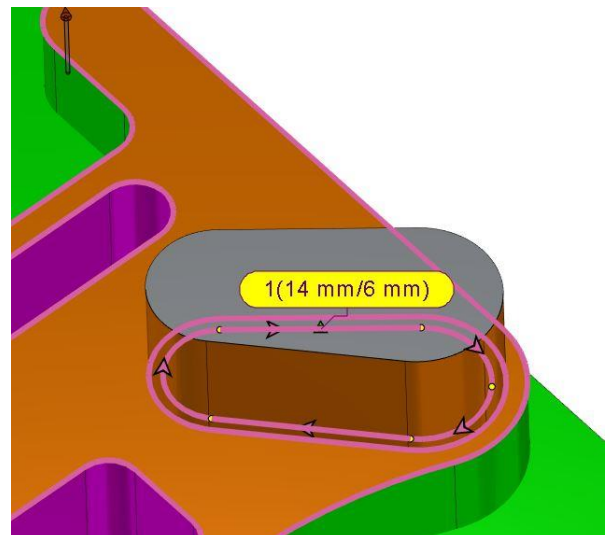
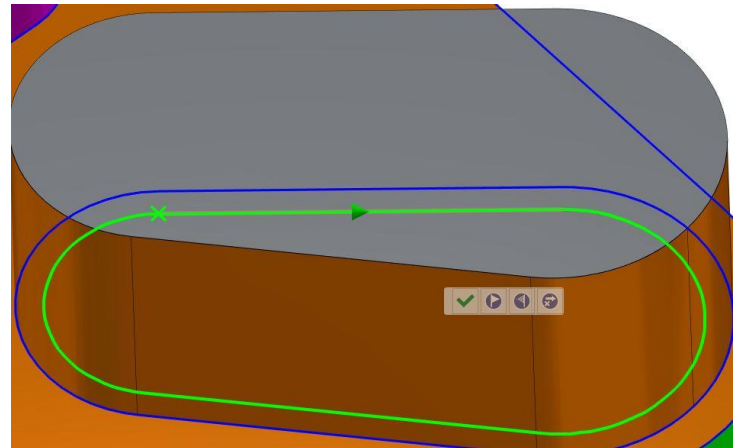
- Use Ctrl+Shift to select the middle of the starting segment

- Left-click on profile OK



- Left-click twice in top Z, type 14

- Left-click twice in bottom Z, type 6



### 2. Tool selection:

- Left-click on

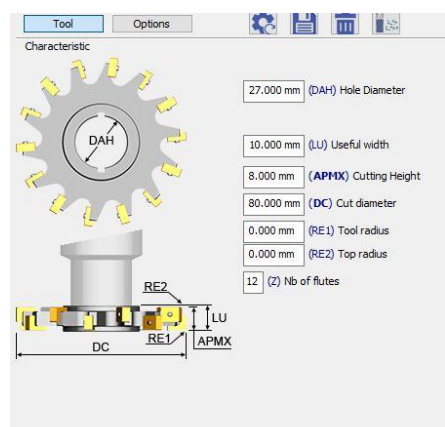


- Left-click on Side and Face Mill Cutter


- Left-click twice on icon

- Modify the tool as follows

Side and Face  
Mill Cutter



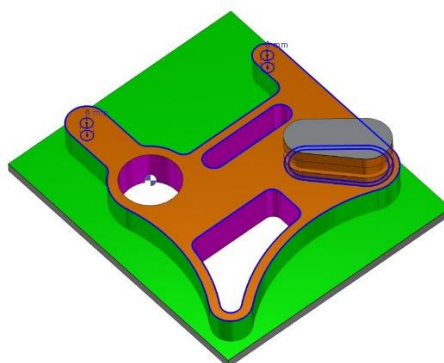
### 3. Machining cycle selection:

- Left-click on 
- Left-click on **Slotting**
- In the "Slotting" strategy, change the slot width to 8, and change the 'profile selected' to "side"
- Change the lead in and lead out length to 30 in movement.






### 4. Toolpath calculation:

- Left-click on Cycle Start 

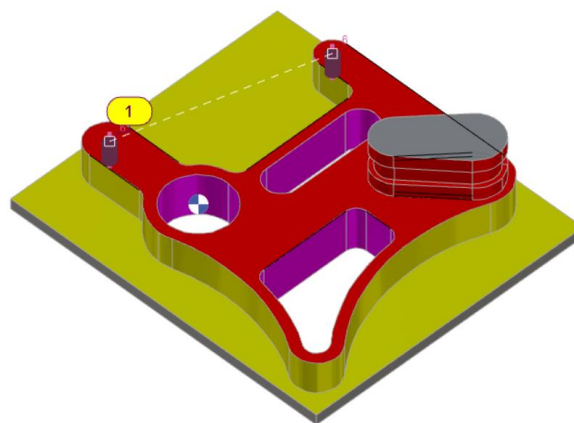
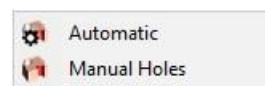


## Opé 90 Drilling of the 2 holes


### 1. Selection of geometry:

- Left-click on the mode  and select **Manual Holes**
- Left-click on 
- Left-click on  to active the multiple selection
- Left-click on the 2 holes

Select all holes with the same diameter.



### 2. Tool selection:




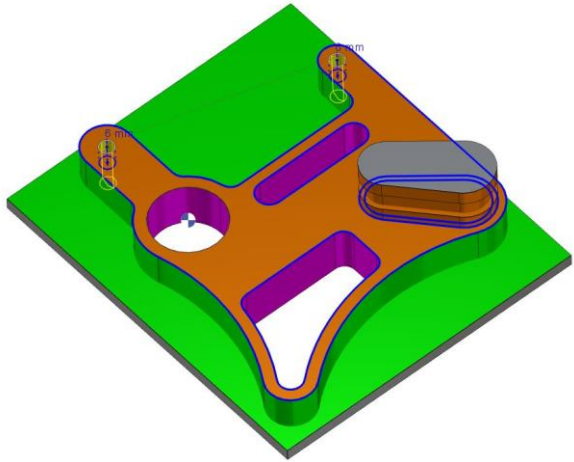
- Left-click on 
- Left-click on **Drill**



Drill





Tool name	Diameter	Point angle	Useful length
	6.000 mm	120.00 deg	55.000 mm

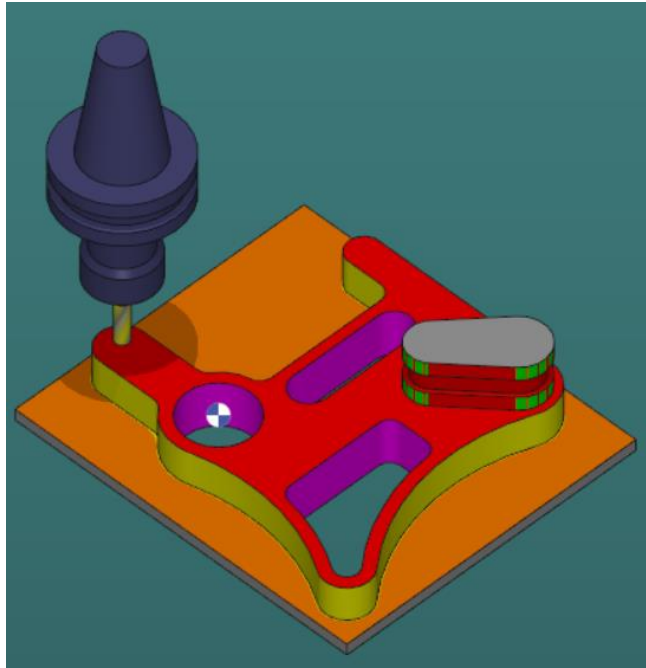


<p>The drill tool of Ø 6 will be created automatically</p>	
<p>3. Machining cycle selection:</p> <ul style="list-style-type: none"> <li>• Left-click on </li> <li>• Left-click on <b>Drilling</b></li> </ul>	 Drilling
<p>4. Tool path calculation:</p> <ul style="list-style-type: none"> <li>• Left-click on Cycle Calculation </li> </ul>	

# Simulation and NC blocks

## 1. Simulation:

- Enter the menu  NC File
- Left-click on 
- Left-click on  to Start simulation on all machining operations
- If you want to switch to step-by-step mode, click the space bar
- Left-click on  Or press the Escape key to stop the simulation



## 2. Generation of NC code:

- Left-click on 
- Select the post-processor M67-FANUC from the list
- Left-click on Open
- Left-click on Confirm
- The NC code is generated.

