



TP 3

CATIA V5 SURFACE



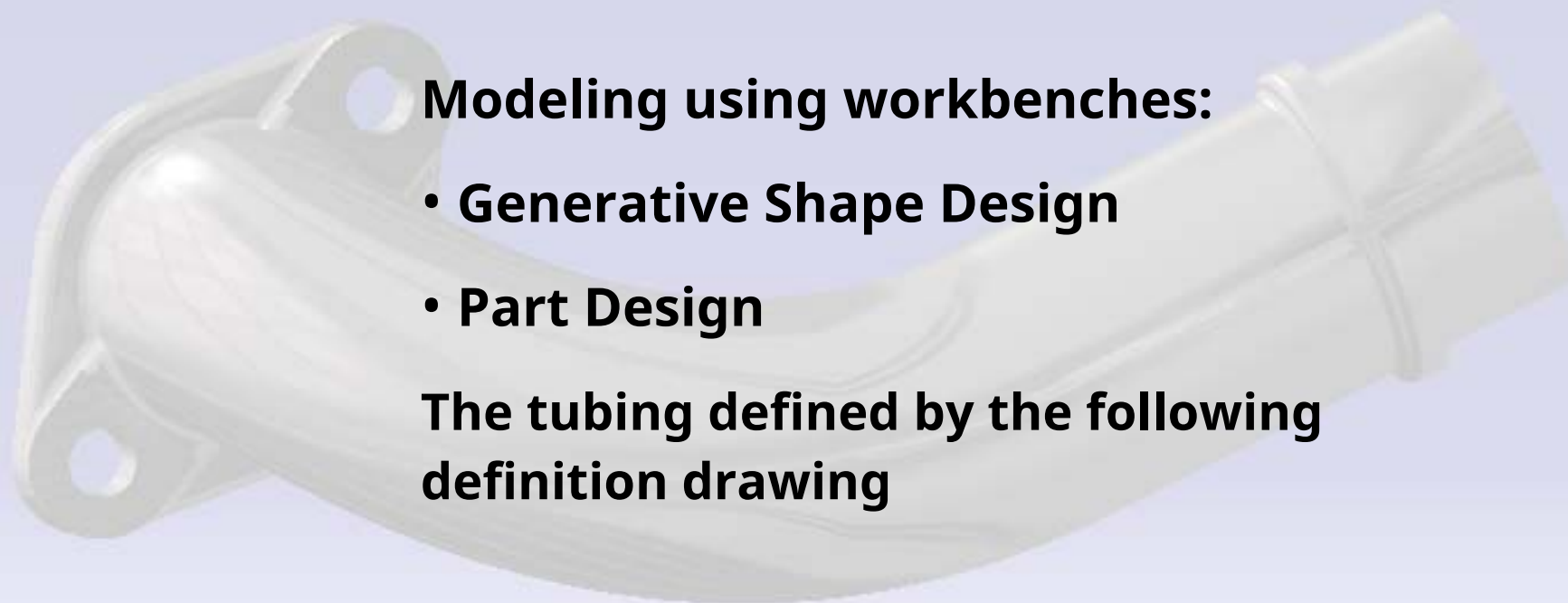


PURPOSE

Modeling using workbenches:

- **Generative Shape Design**
- **Part Design**

The tubing defined by the following definition drawing

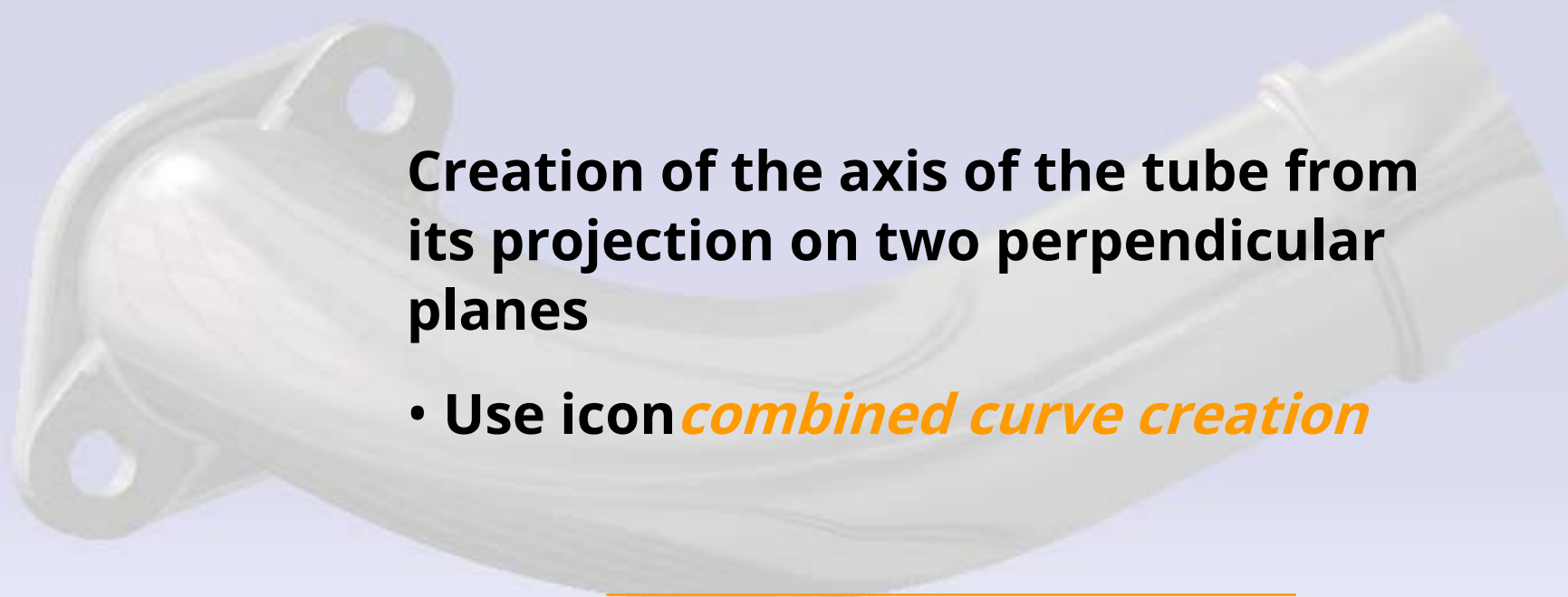




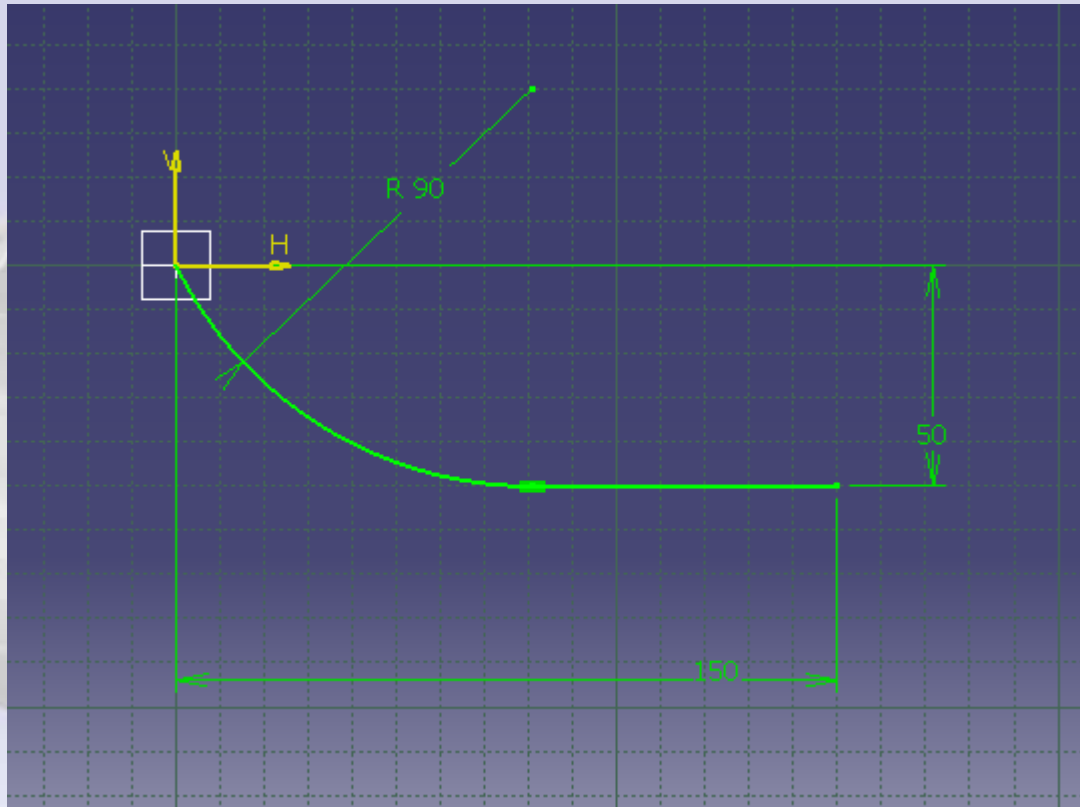
1° STAGE

Creation of the axis of the tube from its projection on two perpendicular planes

- Use icon ***combined curve creation***



Create in the surface body the sketch of the front view axis of the nozzle in the yz plane

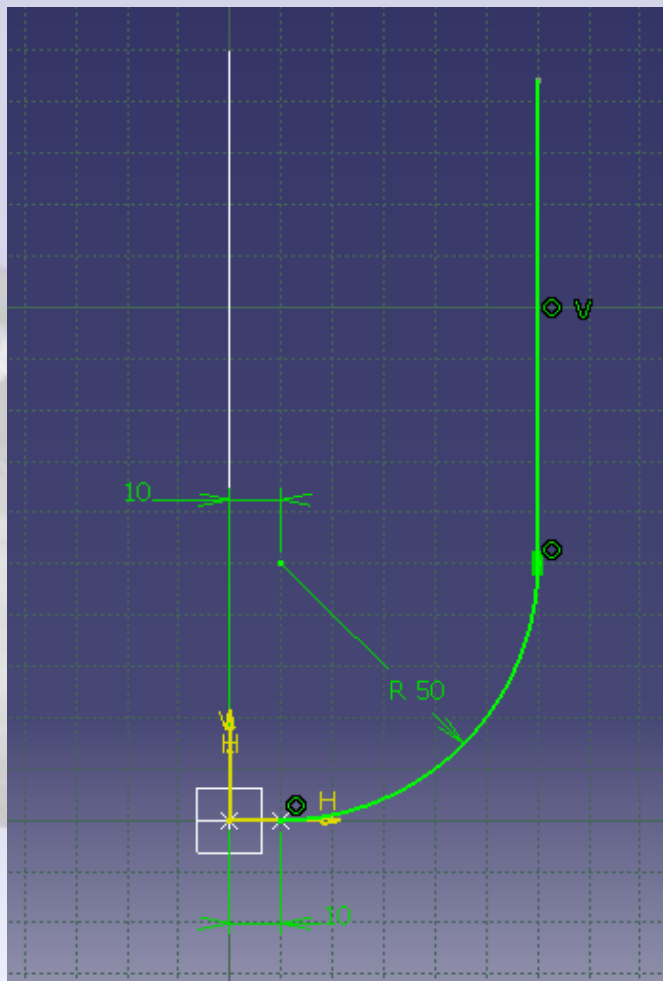


Rename the sketch.1

front view axis

Create in the
plan view

axis sketch
s the xy-plane



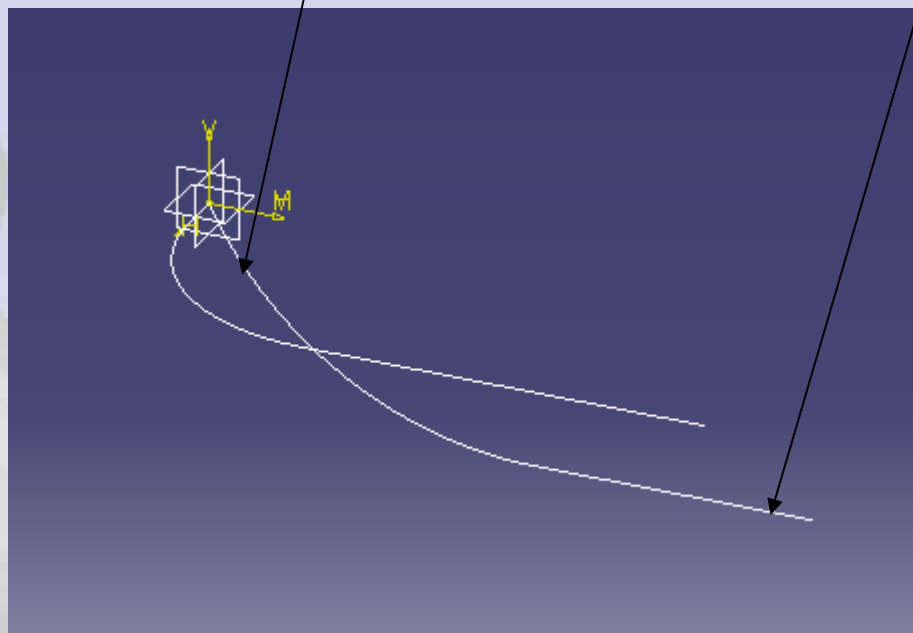
Rename the sketch.1

front view axis



front view axis

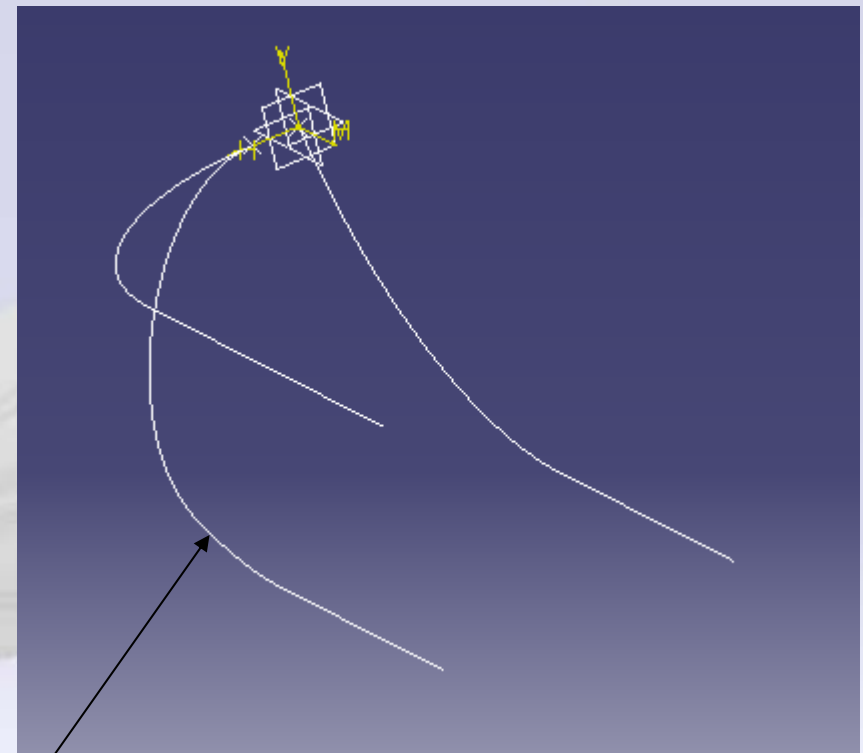
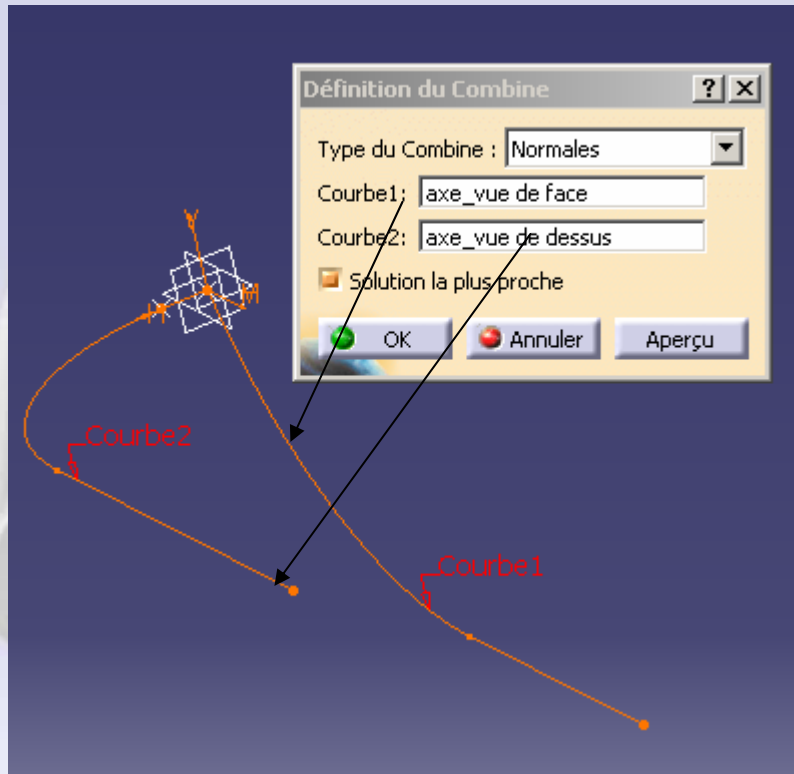
front view axis



Create the axis of the pipe in 3D using the icon creation of *combined curve*



Axis of the pipe that normally projects on the yz and xy planes following the previously created axes



Rename *combine.1*

pipe axis



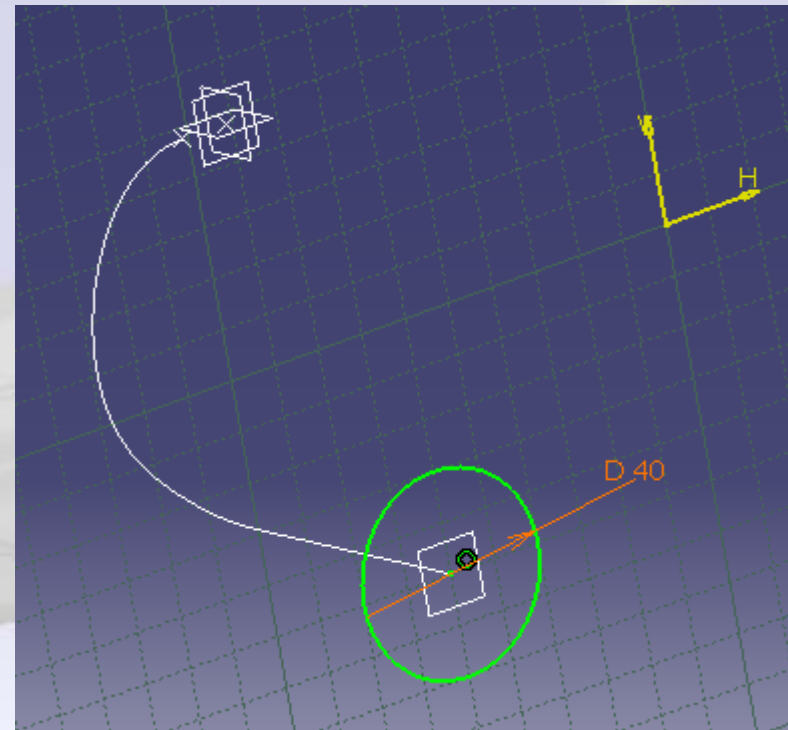
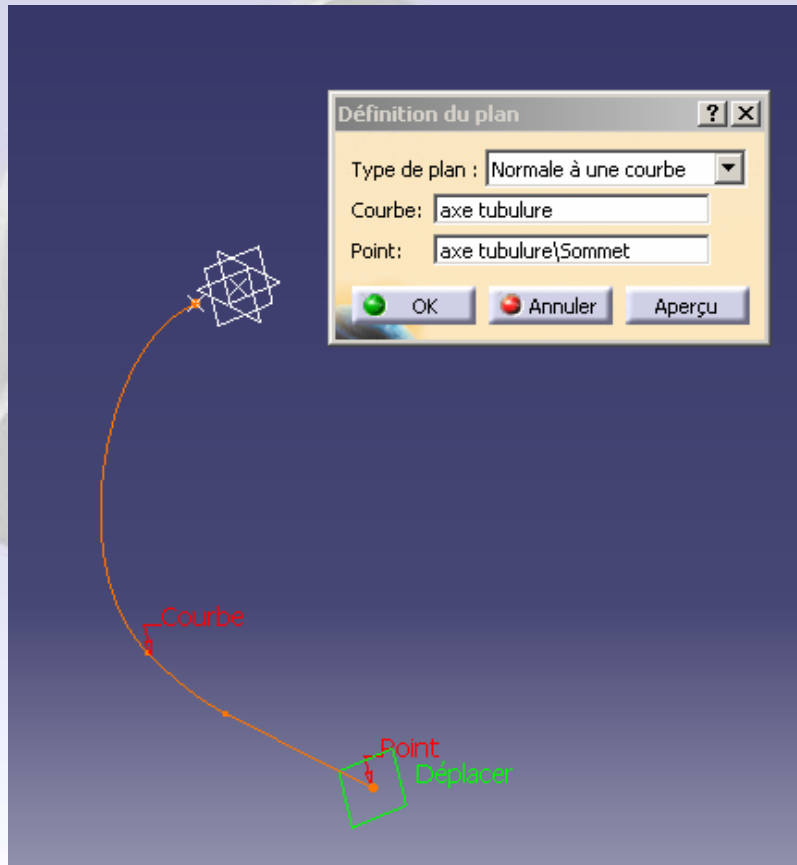
2° STAGE

Create the outer surface of the tubing by:

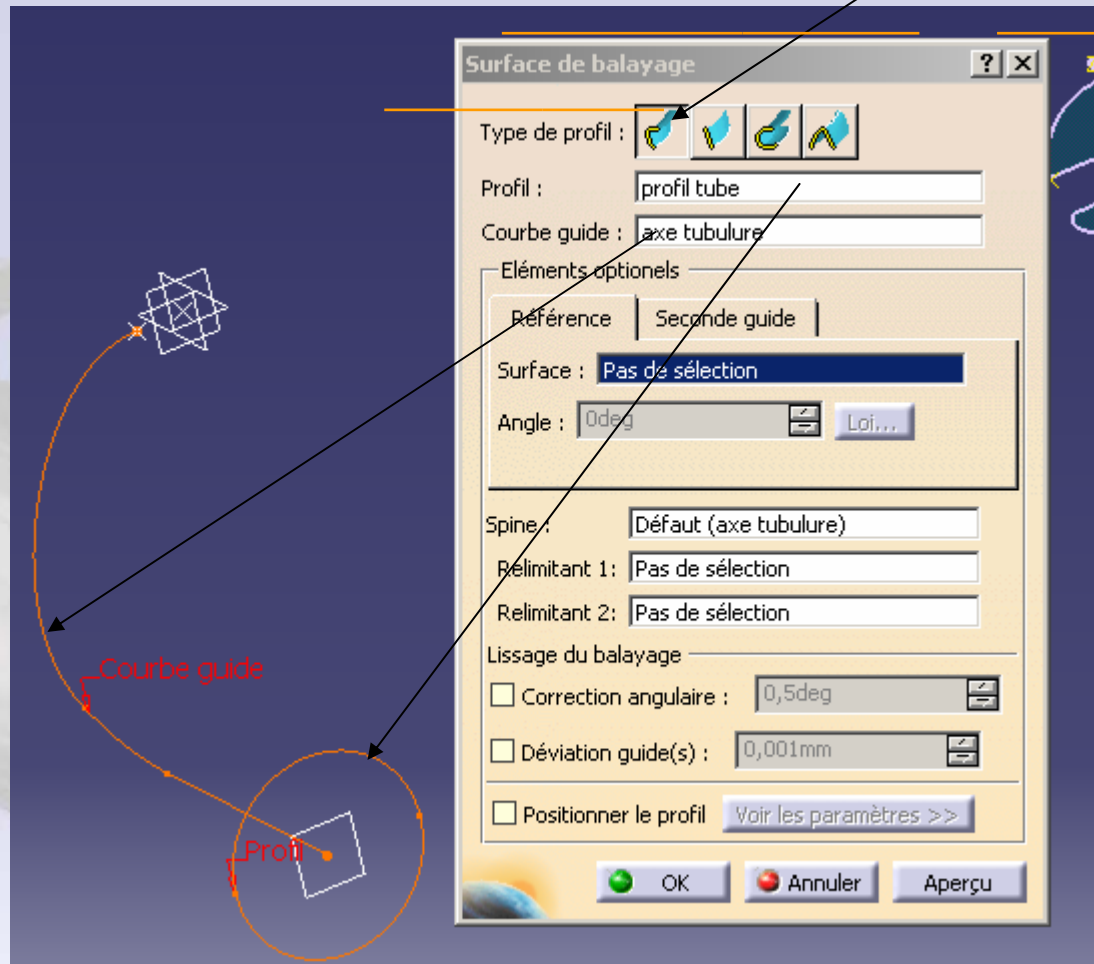
- sweep of a circle with a diameter of 40 mm Use the icon *explicit swipe*
- extrusion of the section at the end of the tube
- join the two surfaces to obtain the outer tube surface

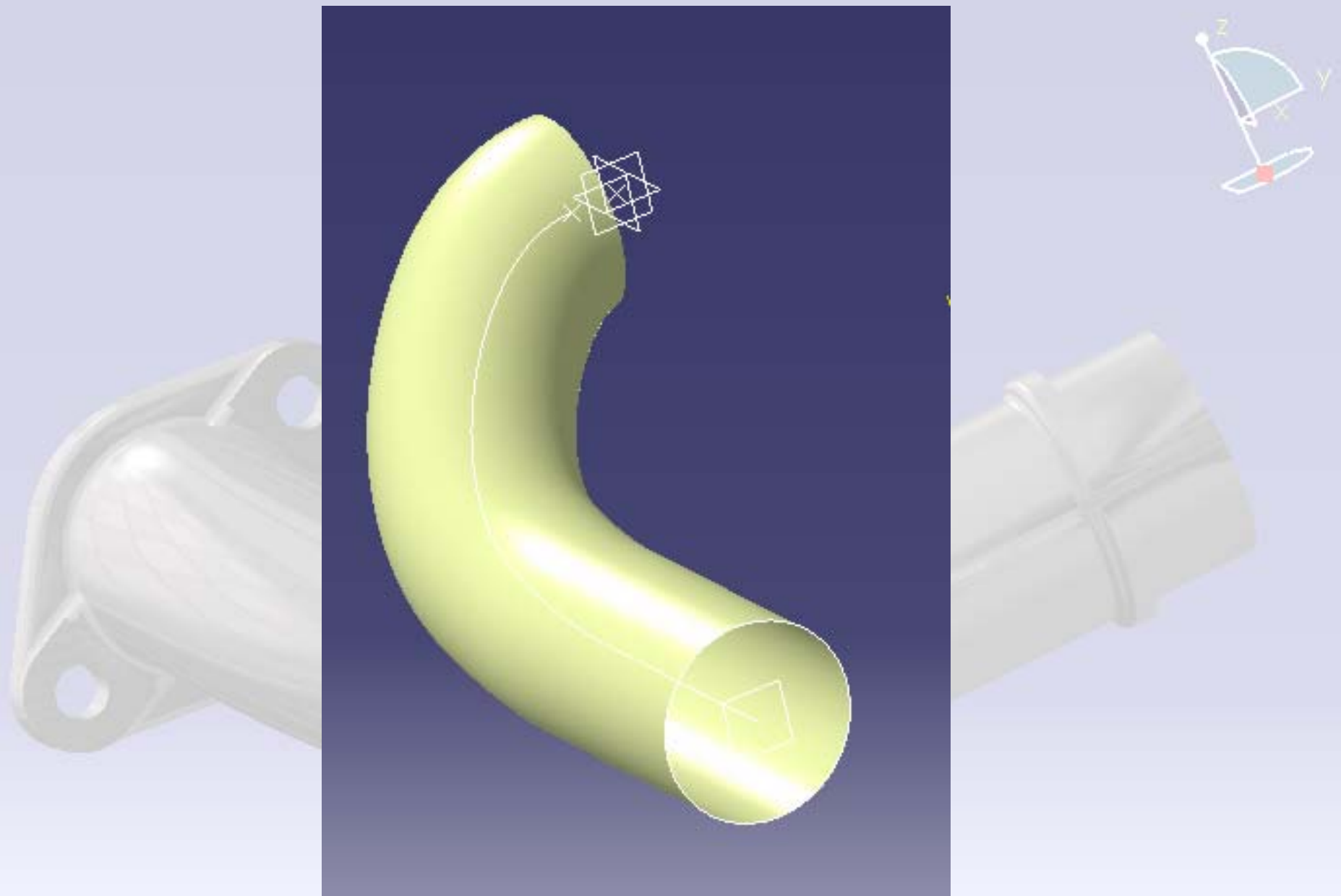
Create a plane perpendicular to the axis of the tubing at its end.

Use in this plane and create the sketch of the scanning profile, here a circle with a diameter of 40 mm



Create the outer tubing by **explicit swipe** of **tube profile** along the guide **tube axis**.



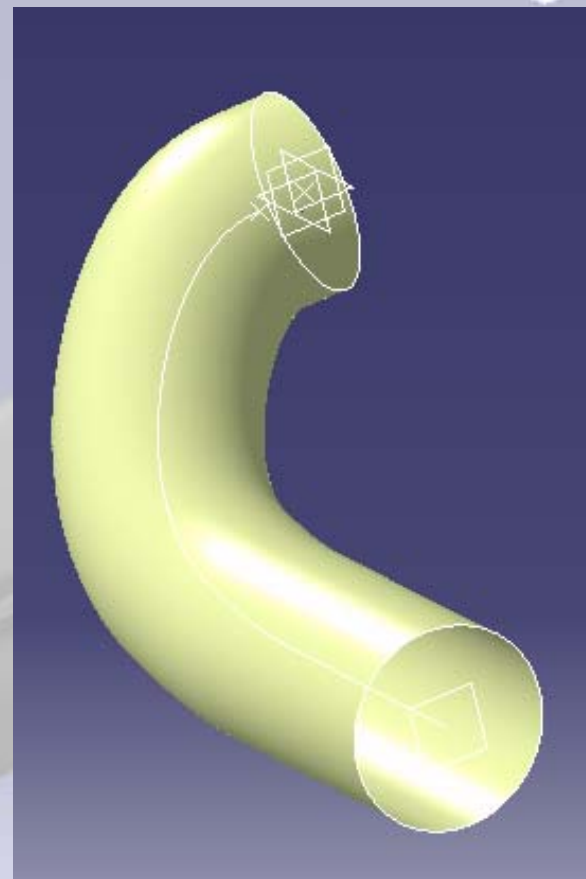
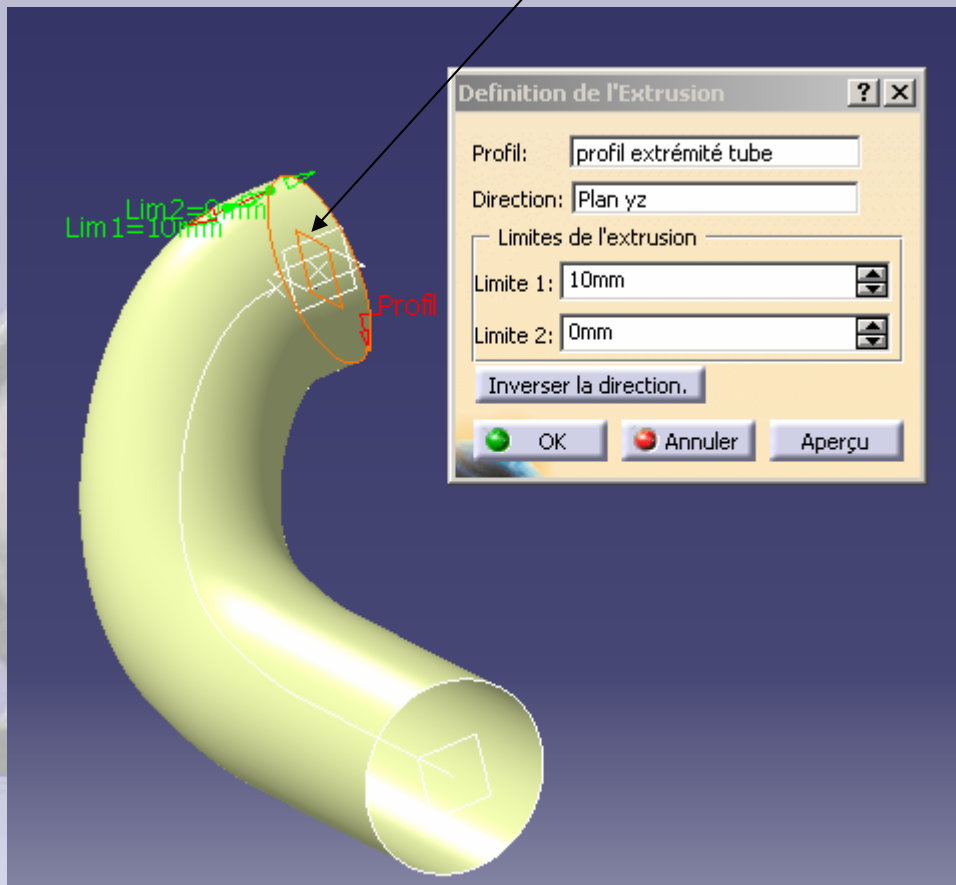


Rename *scan.1*

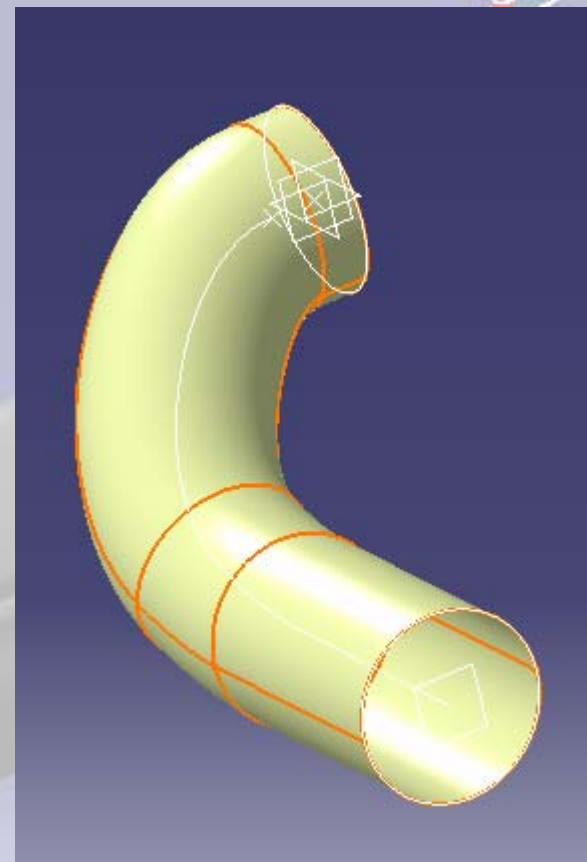
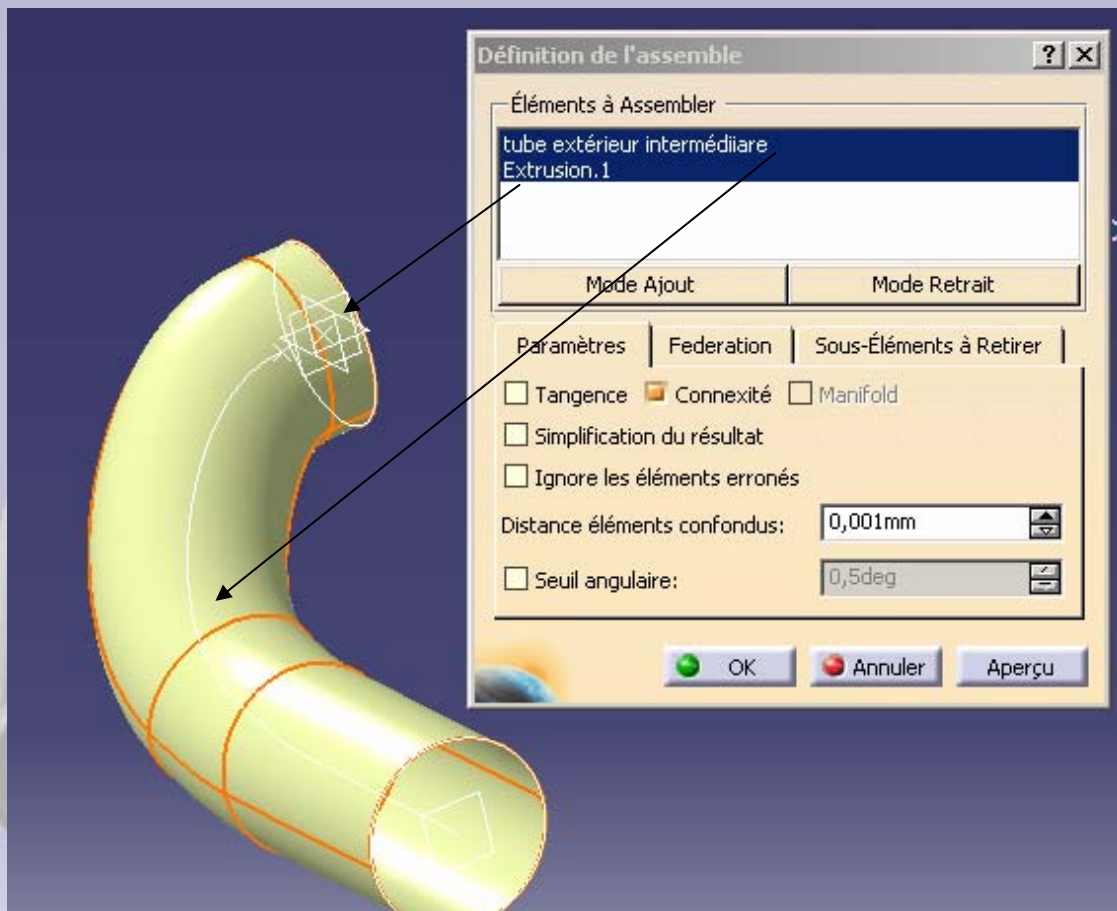
intermediate outer tube



Extrusion on 10 mm



Join the two surfaces to obtain the outer tube



Rename **attach.1**

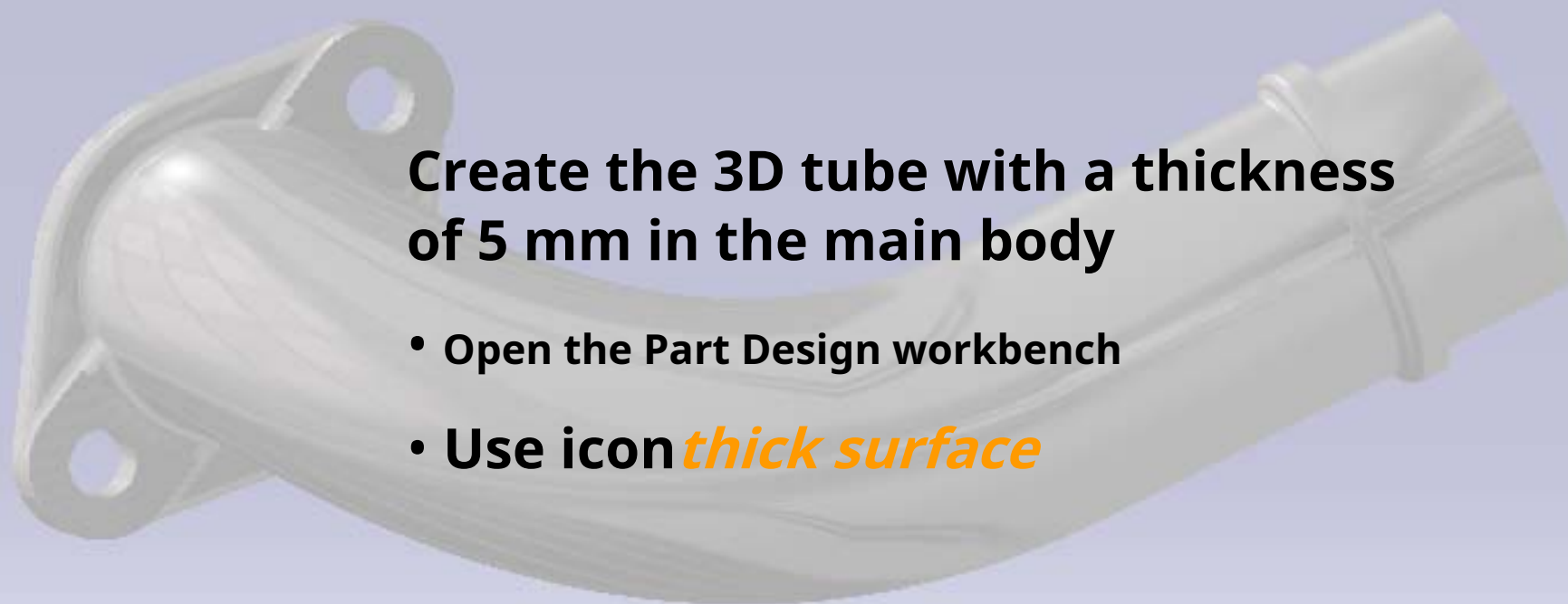
outer tube



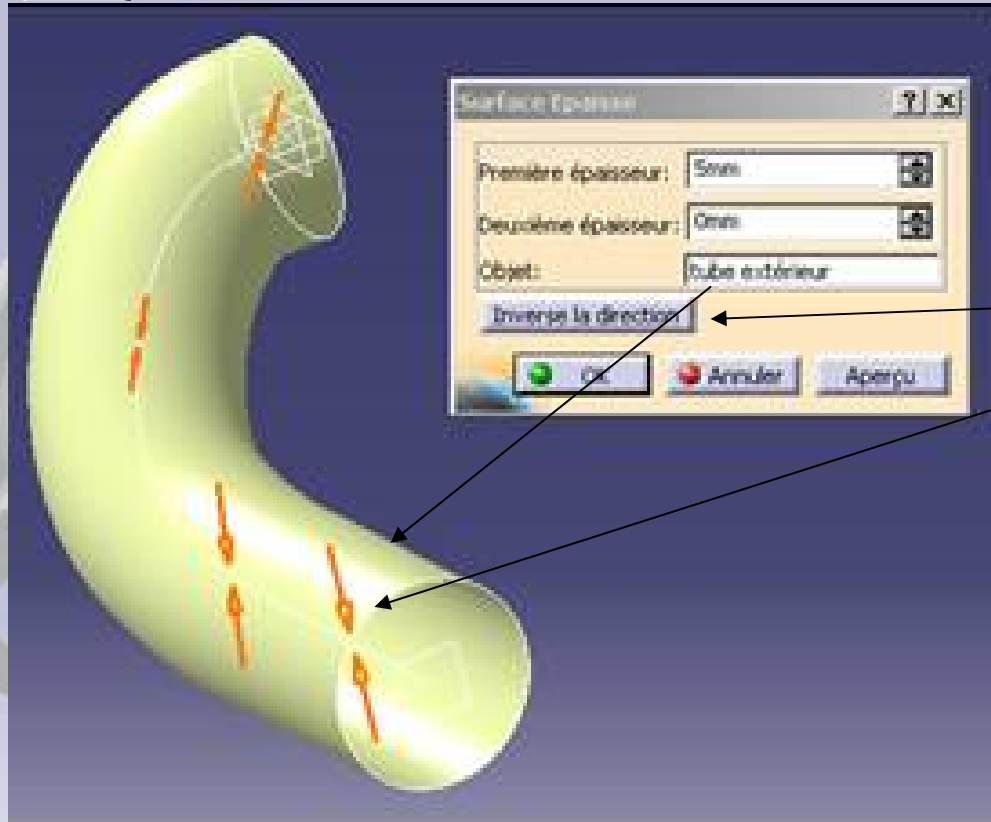
3° STAGE

Create the 3D tube with a thickness of 5 mm in the main body

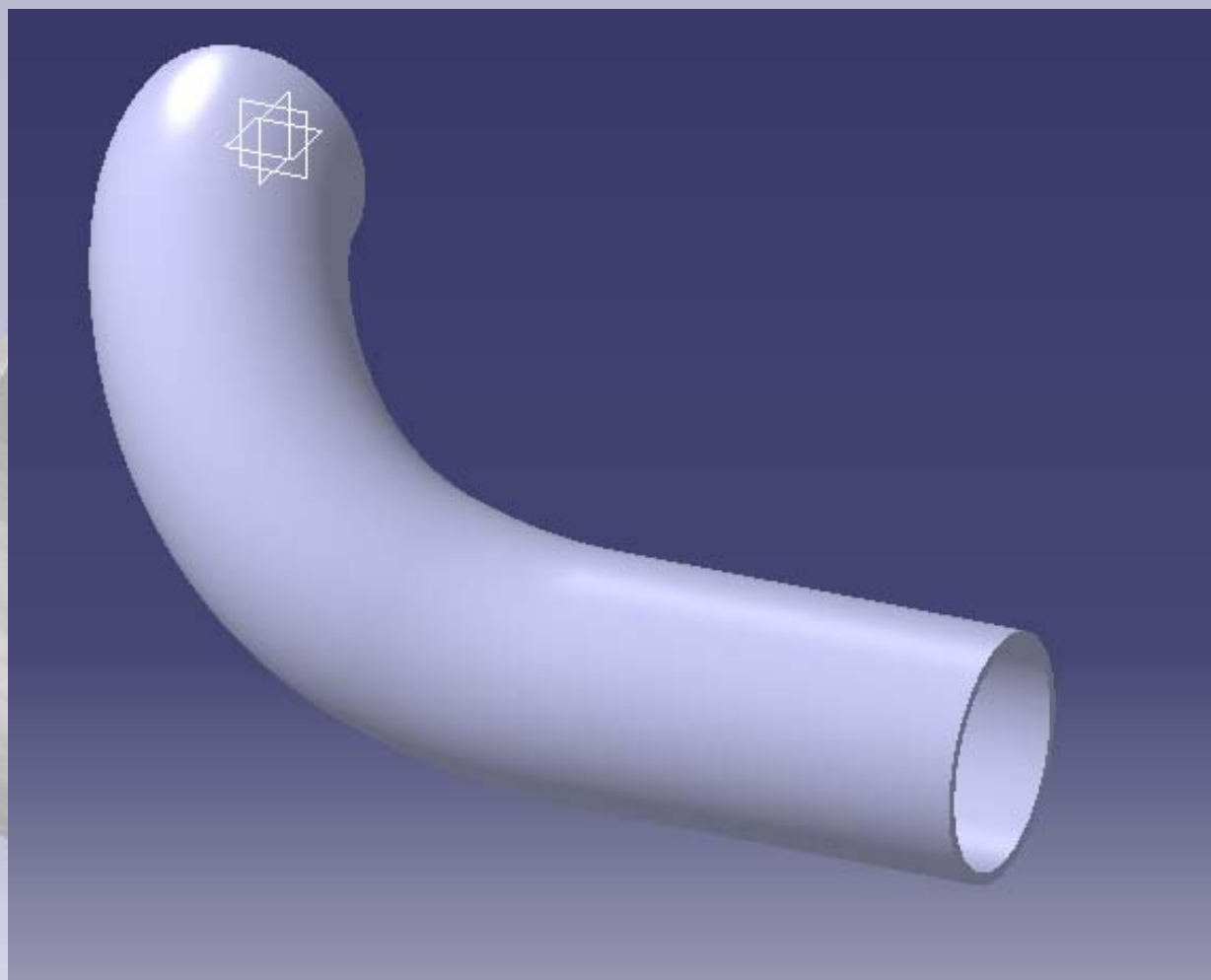
- Open the Part Design workbench
- Use icon *thick surface*



Create the 5 mm thick tube using the thick surface icon



Reverse the direction to put the material in the desired direction.



Hide surface *outer tube* Rename

thick surface.1

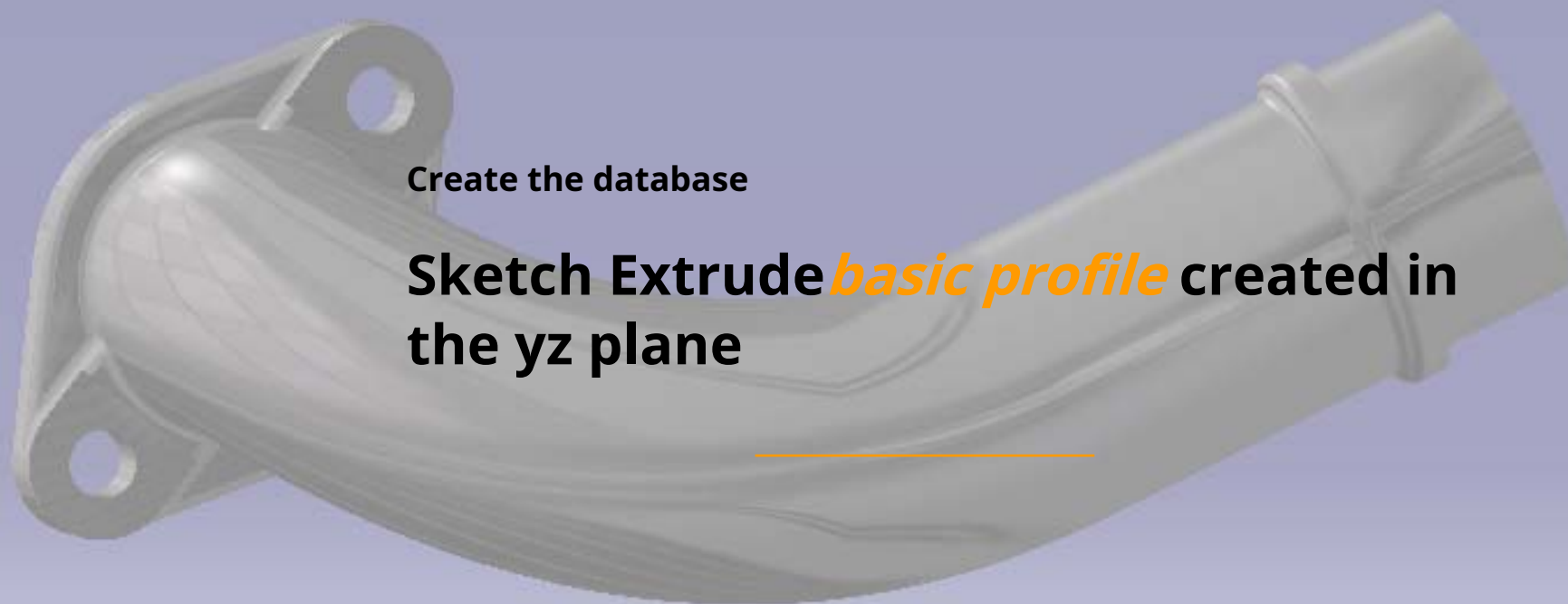
thick tube



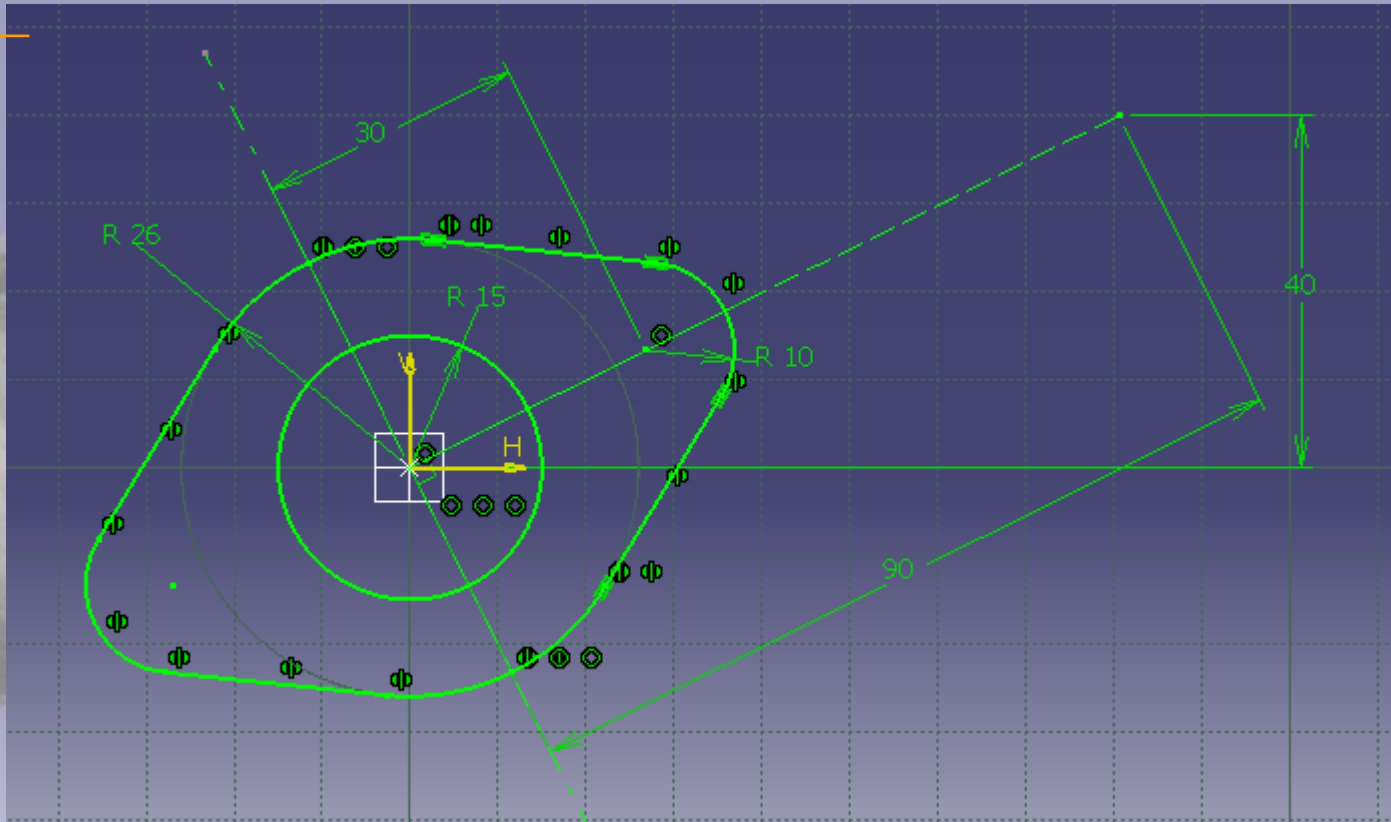
4° STAGE

Create the database

Sketch Extrude *basic profile* created in
the yz plane



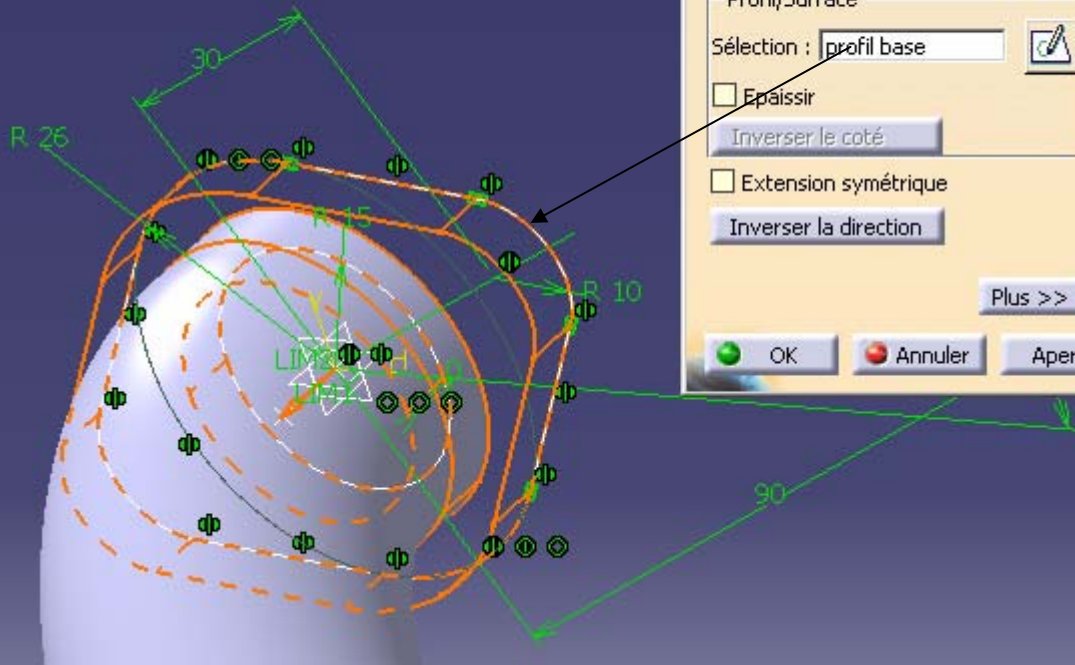
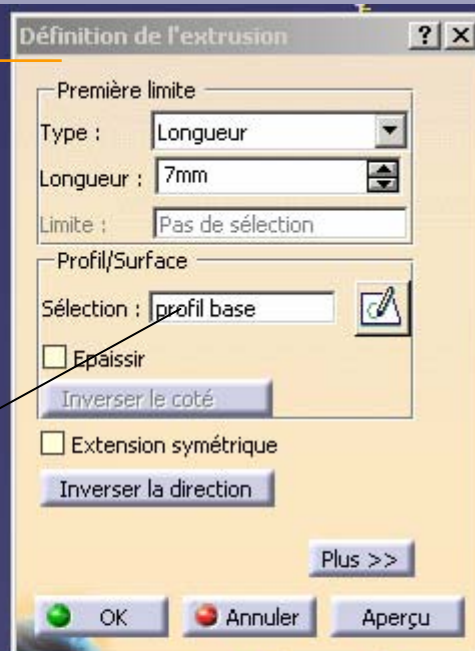
Open a sketch in the zy plane and draw the **basic profile** defined below.



Rename **the sketch.3**

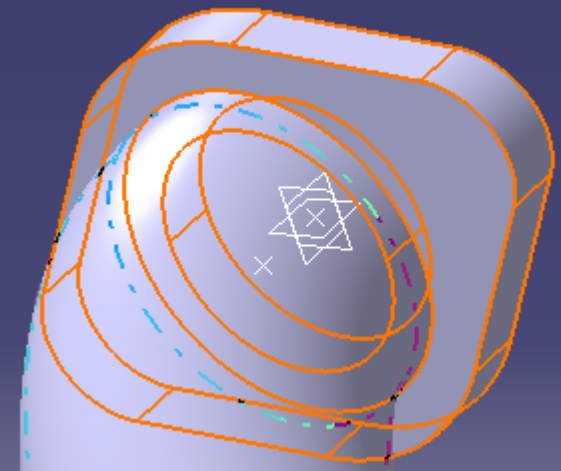
basic profile

Extruding the *basic profile*



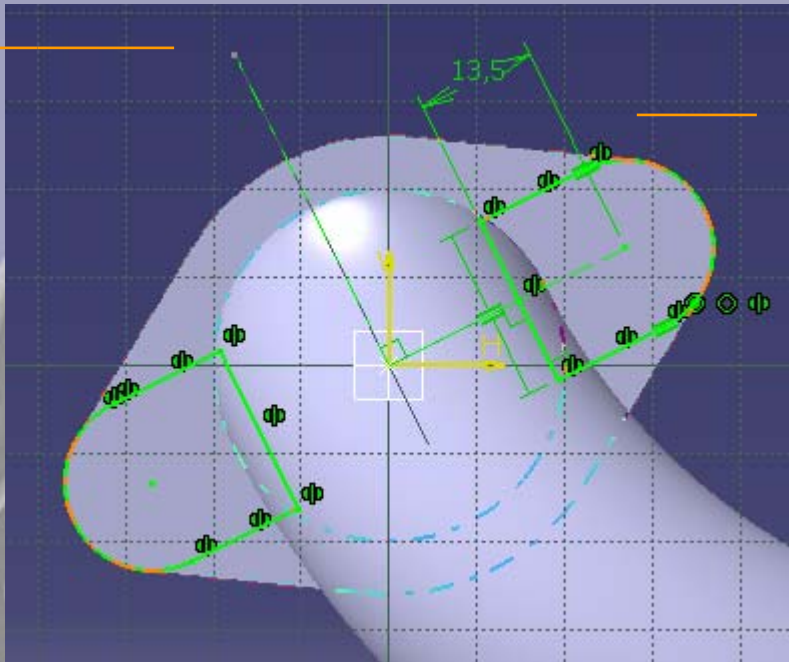
Rename *extruding.1*

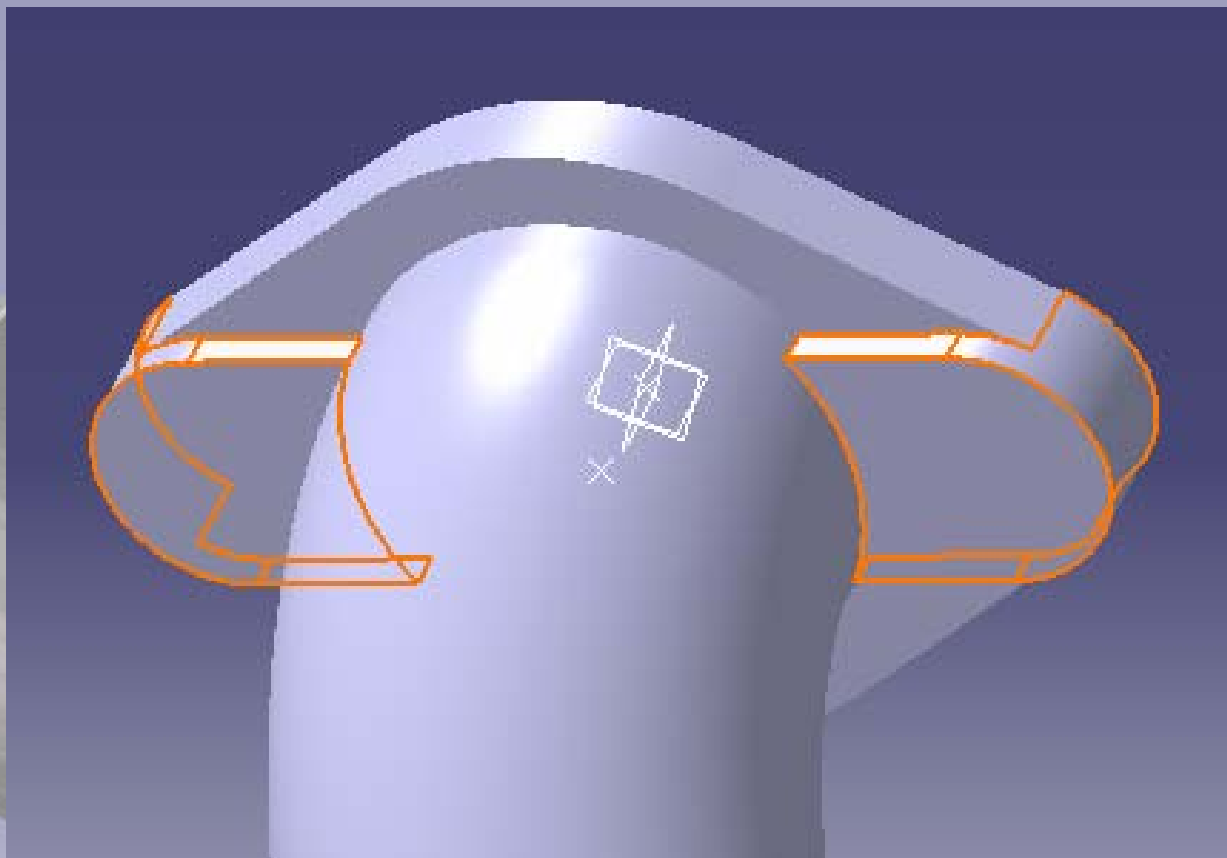
base



Create the bosses

- Open a sketch on the top plane of the base and draw the *boss profiles*
- Extrusion of the profiles to obtain the *bosses*





Rename *extruding.2*

bosses

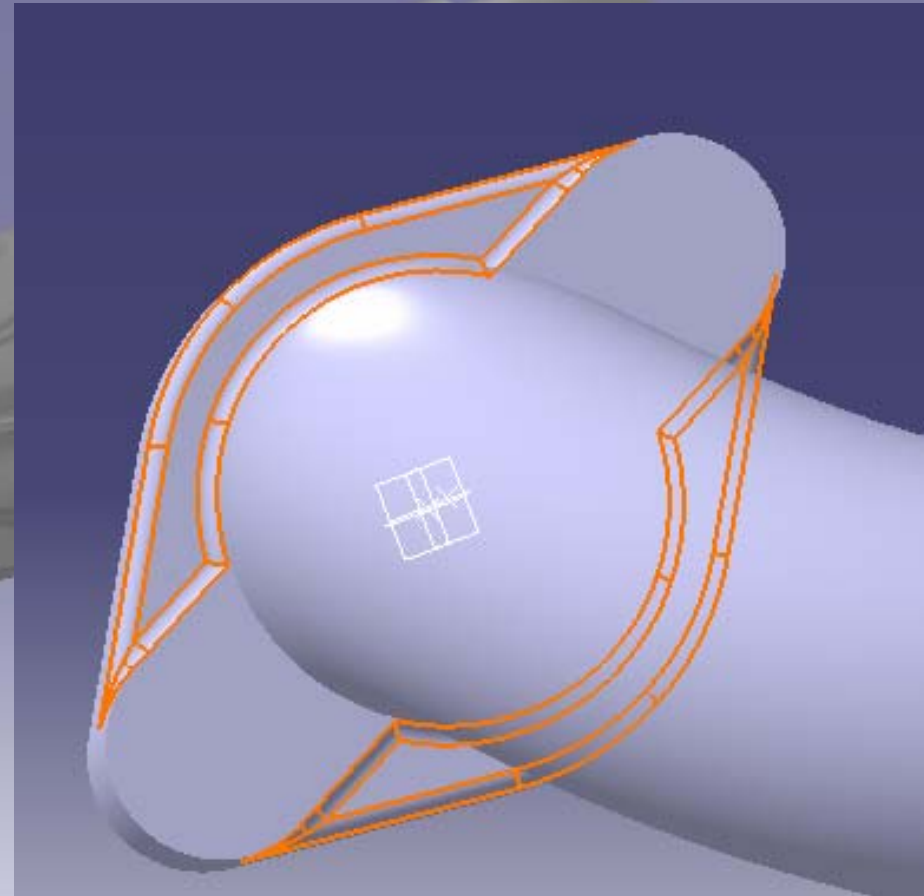
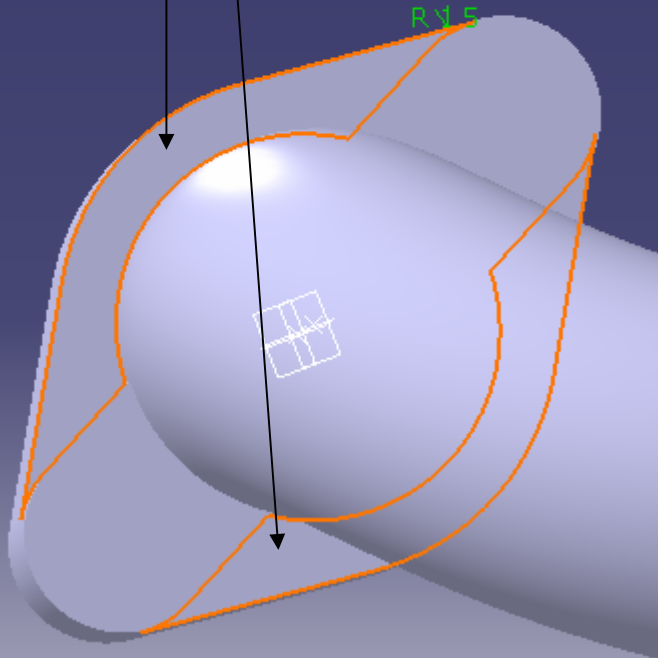
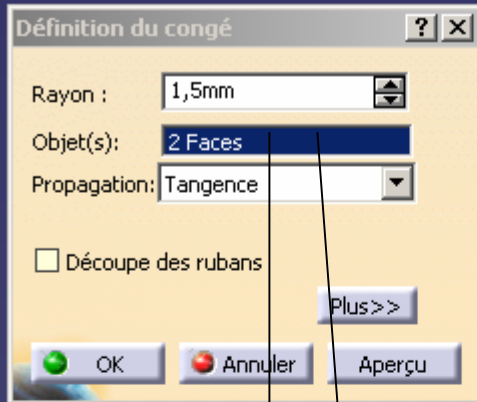


5° STAGE

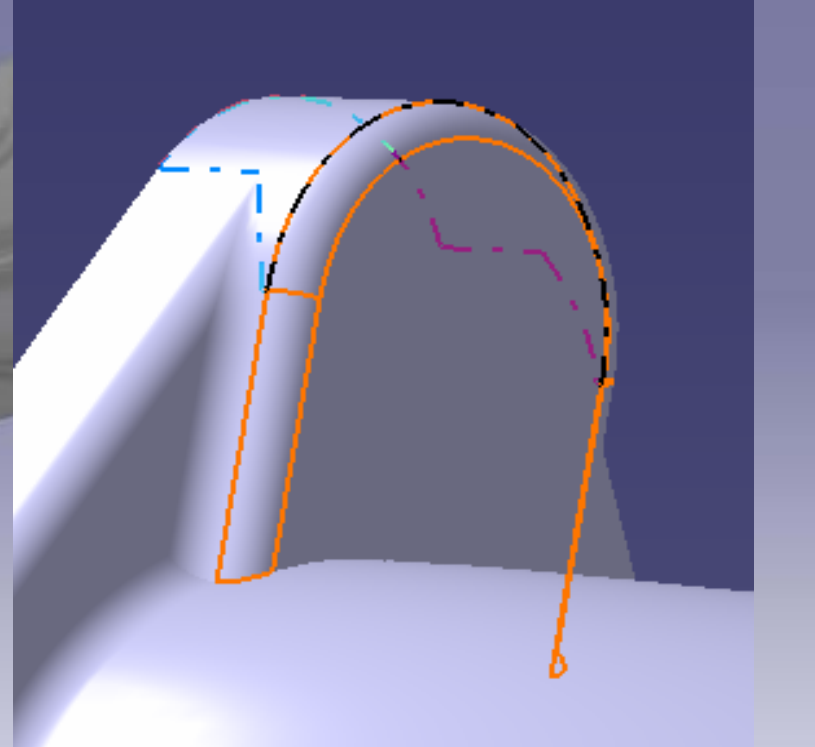
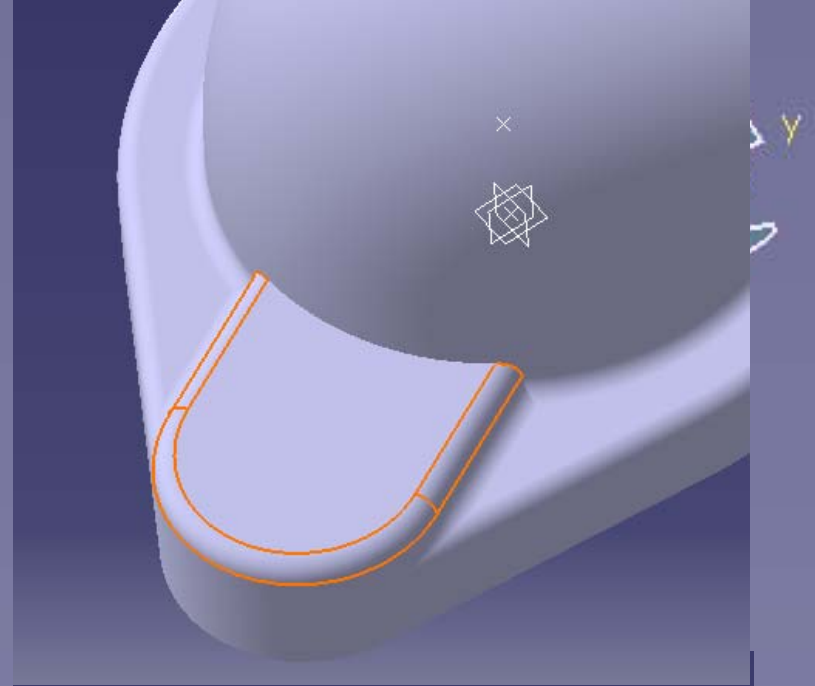
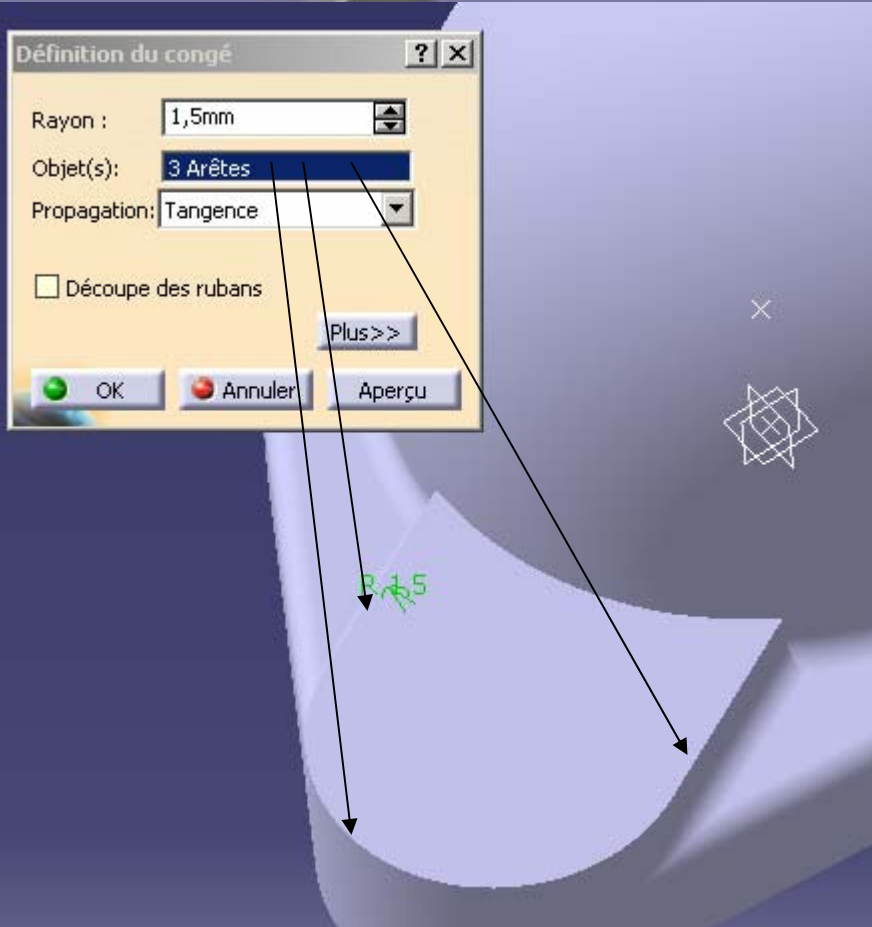
Create fillets



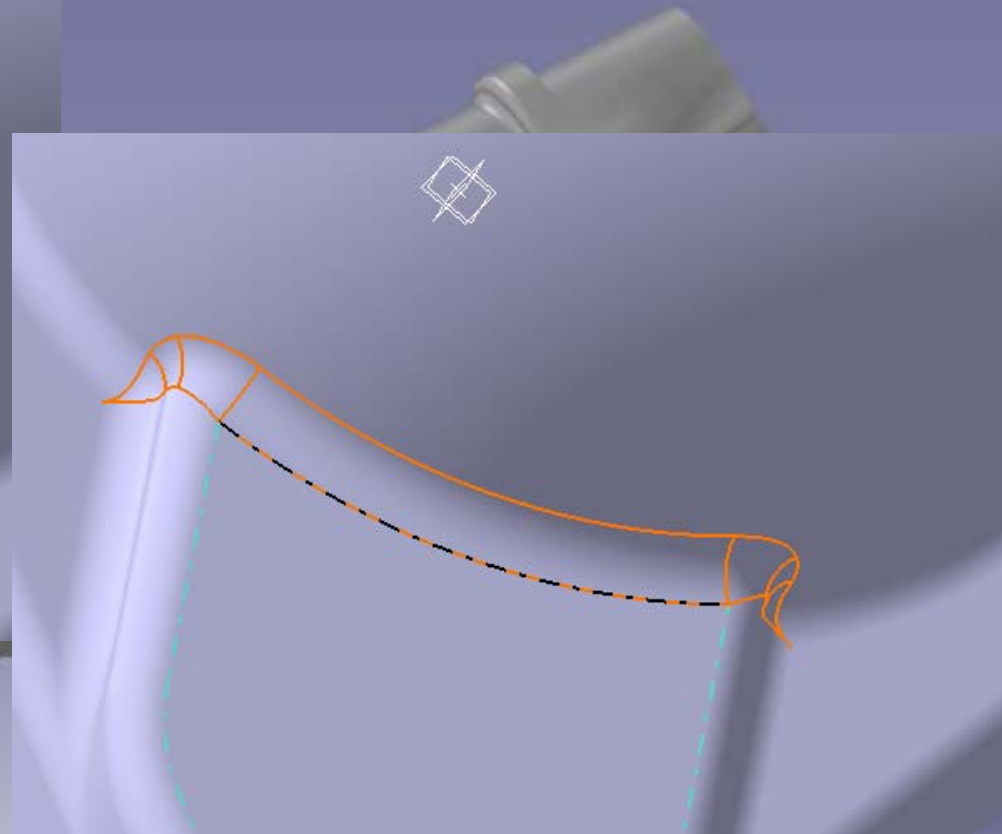
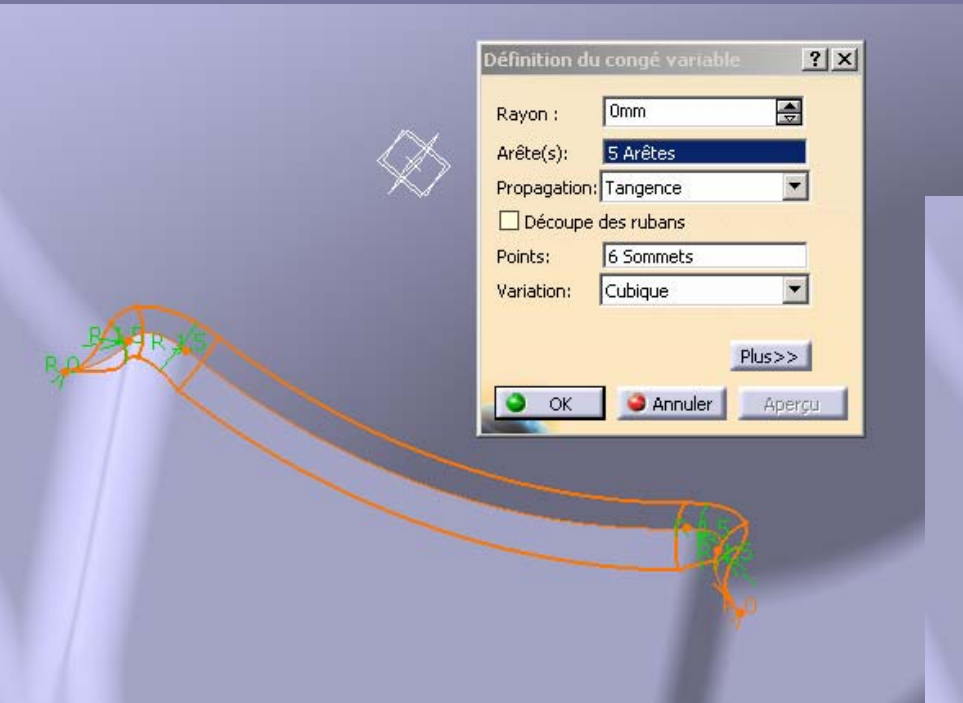
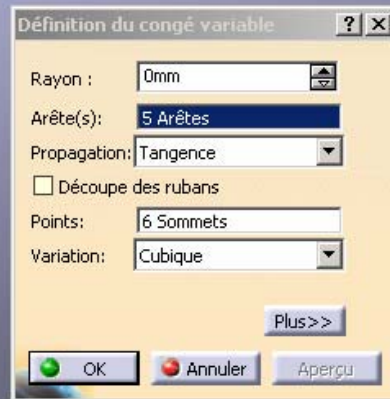
on surfaces



Create edge fillets



Create variable fillets from 0.5 to 1.5 mm

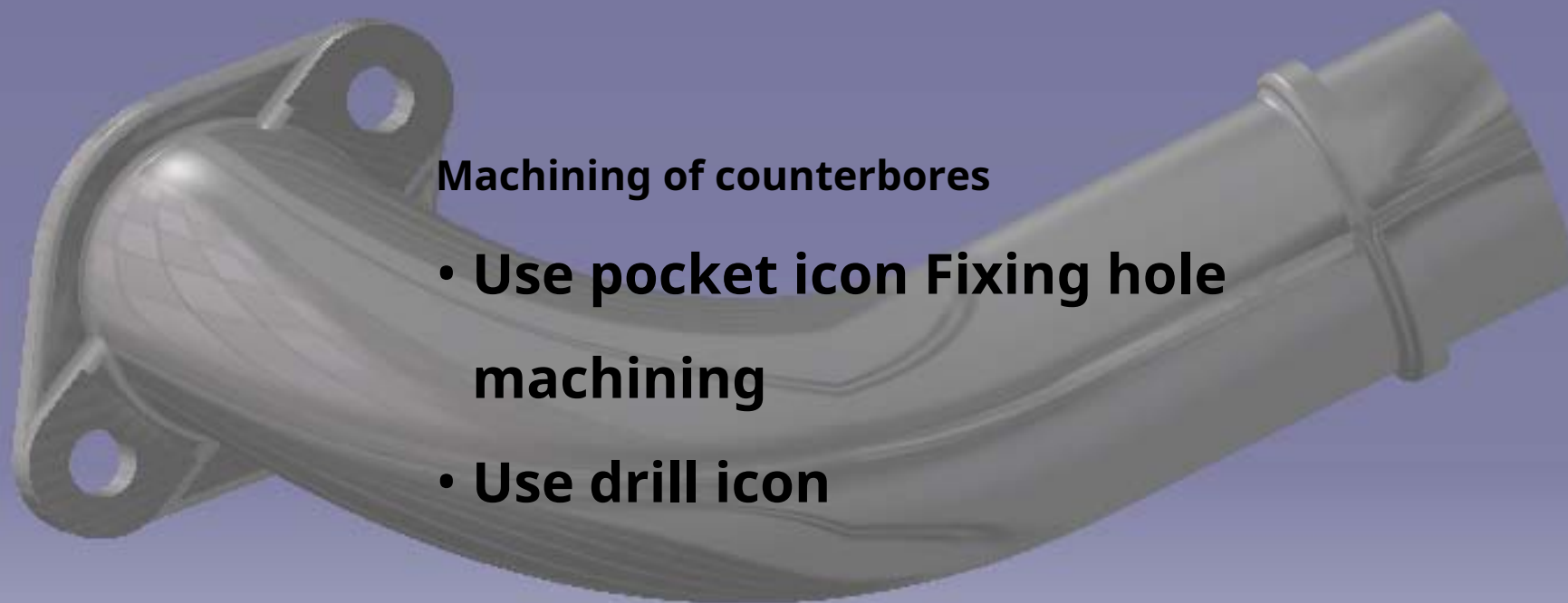




6° STAGE

Machining of counterbores

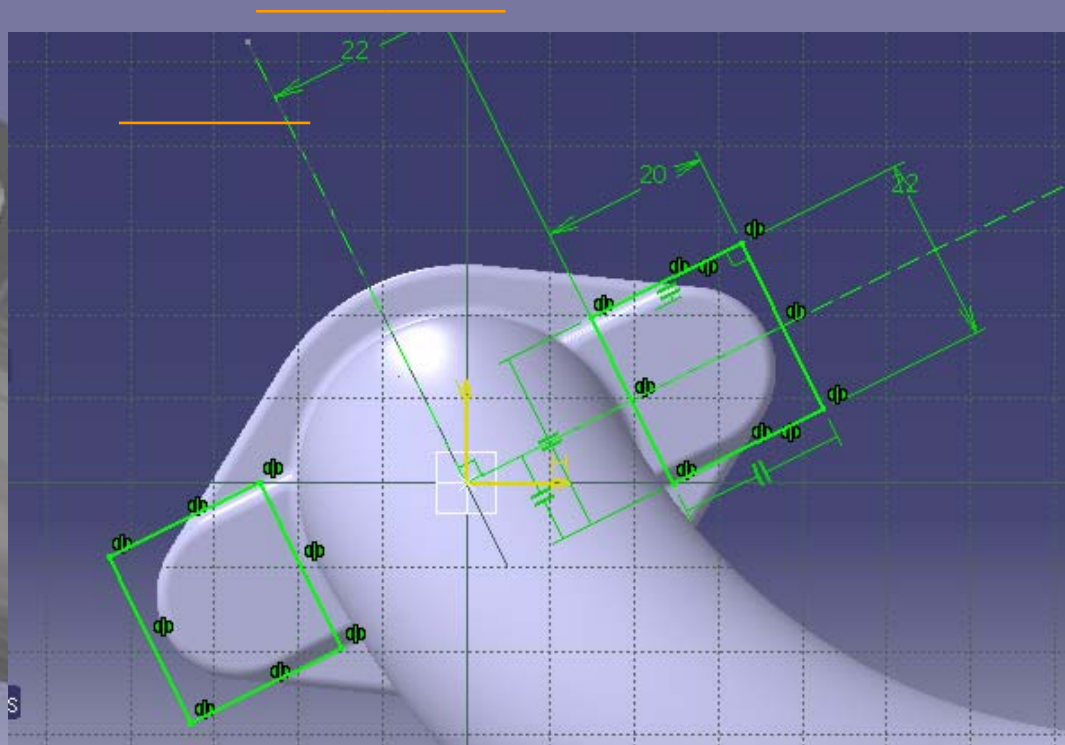
- **Use pocket icon Fixing hole machining**
- **Use drill icon**

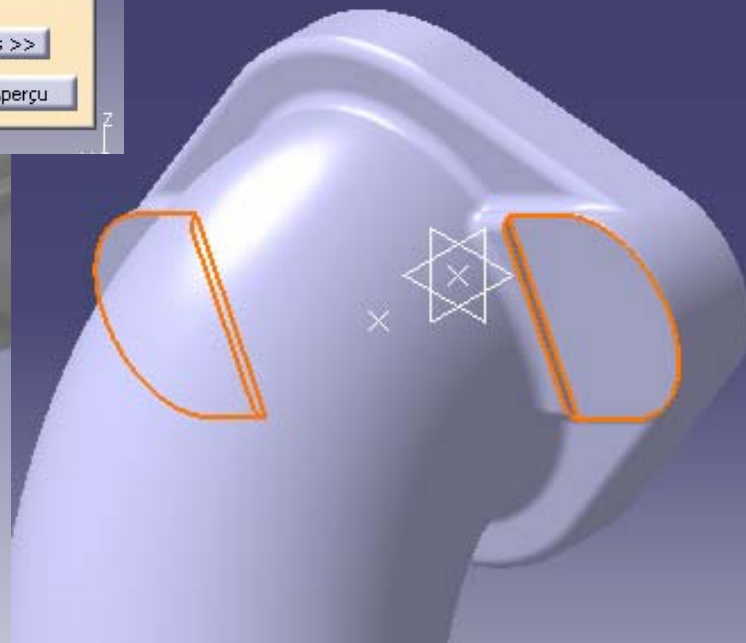
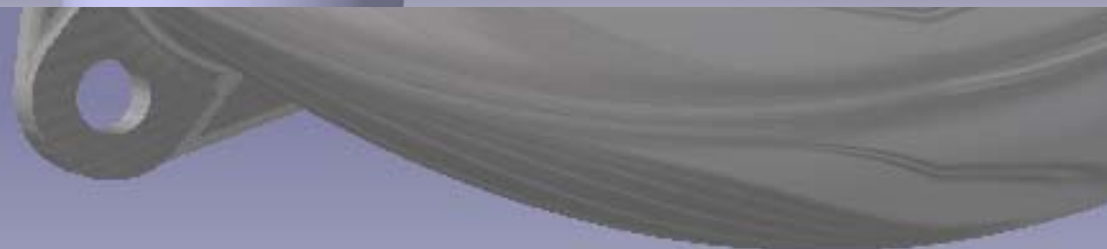
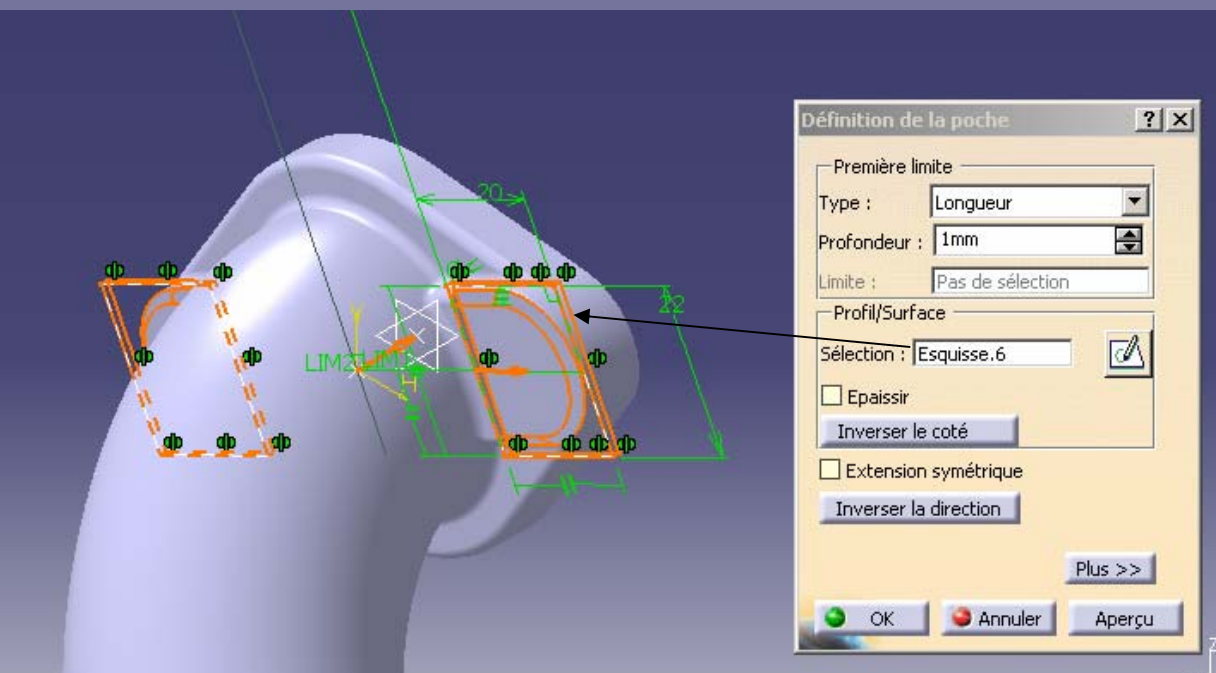




Create the machinings

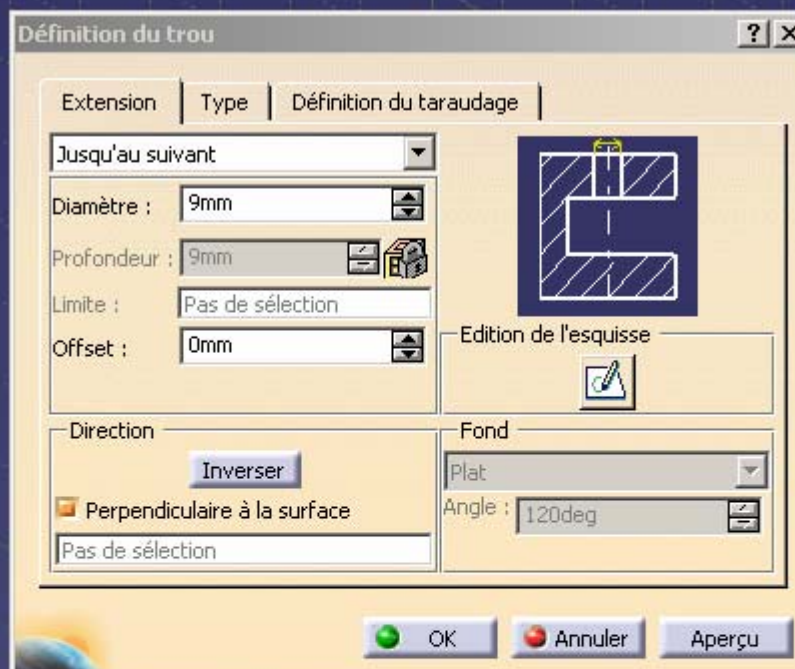
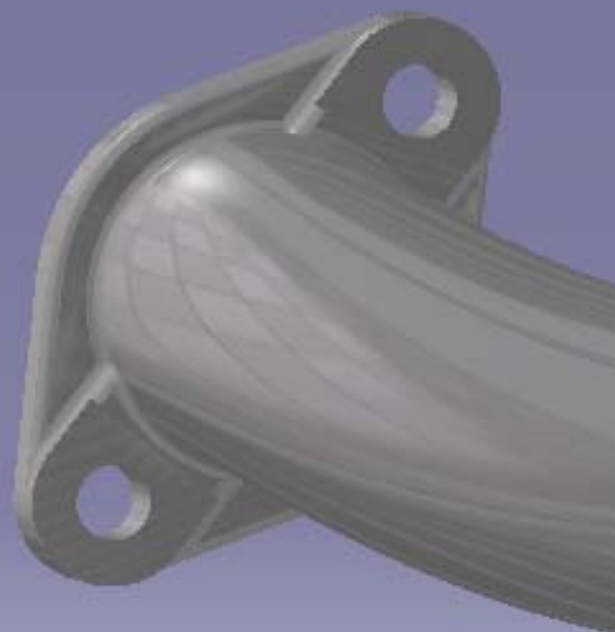
- Open a sketch on the top plane of the *bosses bosses*
- Use the pocket icon to get the *machining*

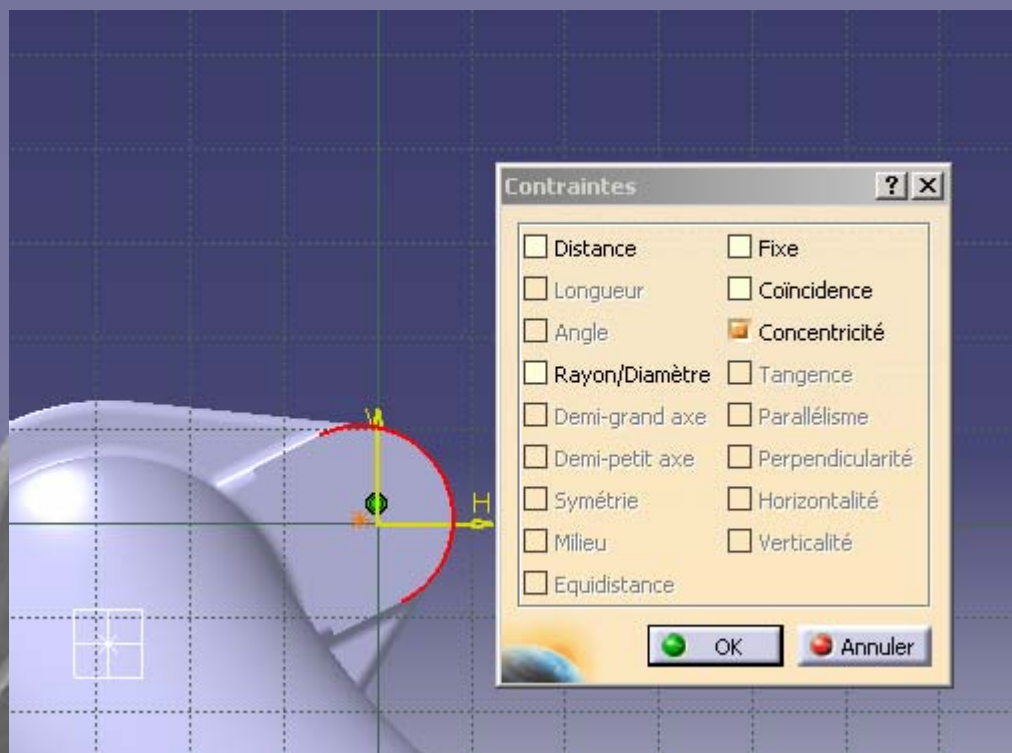




Rename **pocket.1**

machined tube





Constrain hole position



Rename *hole.2*

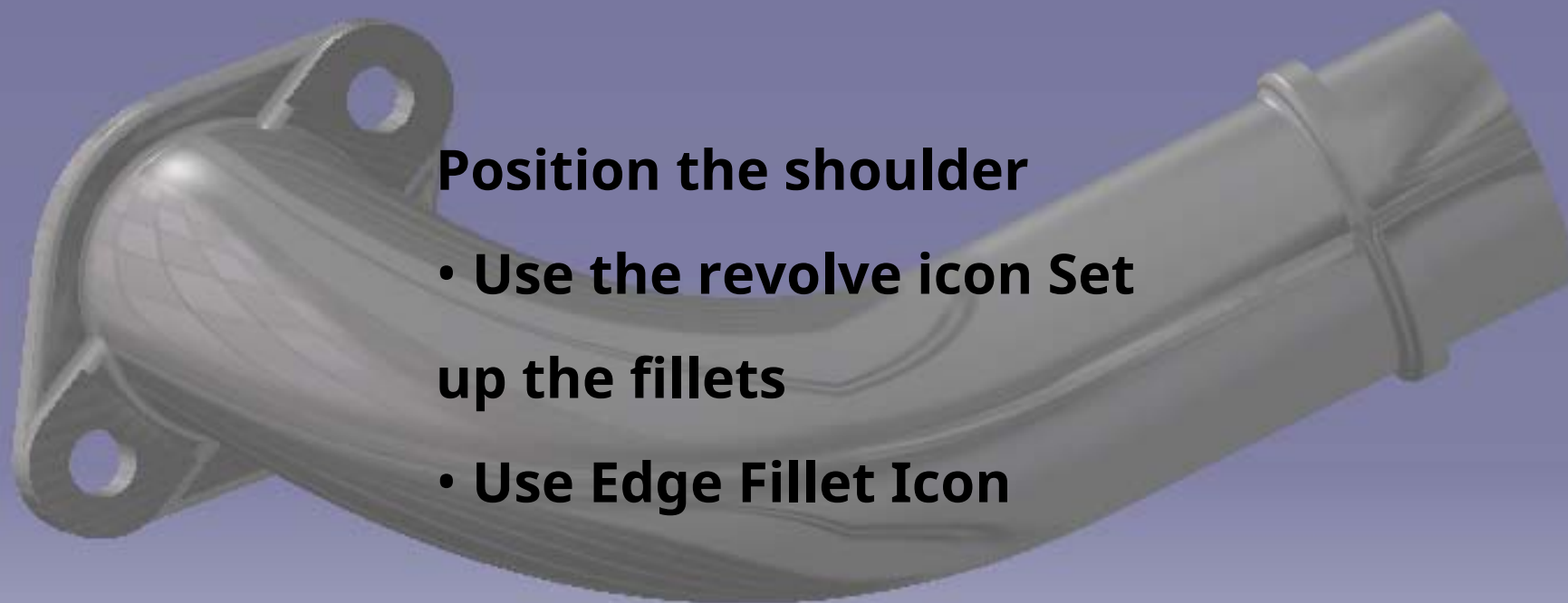
machined tube with holes



7° STAGE

Position the shoulder

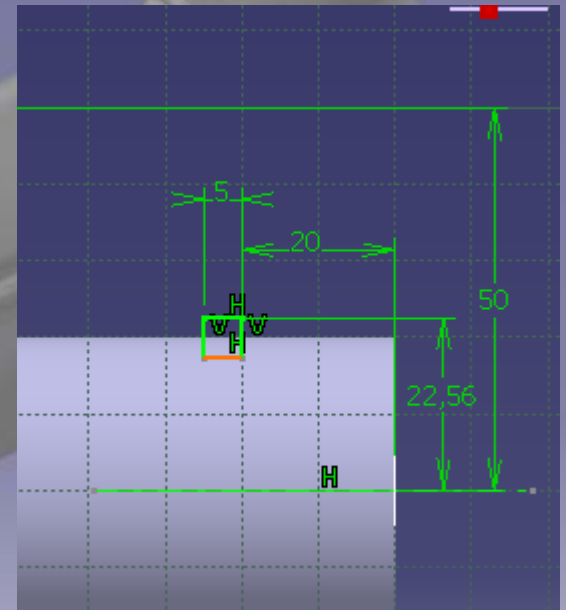
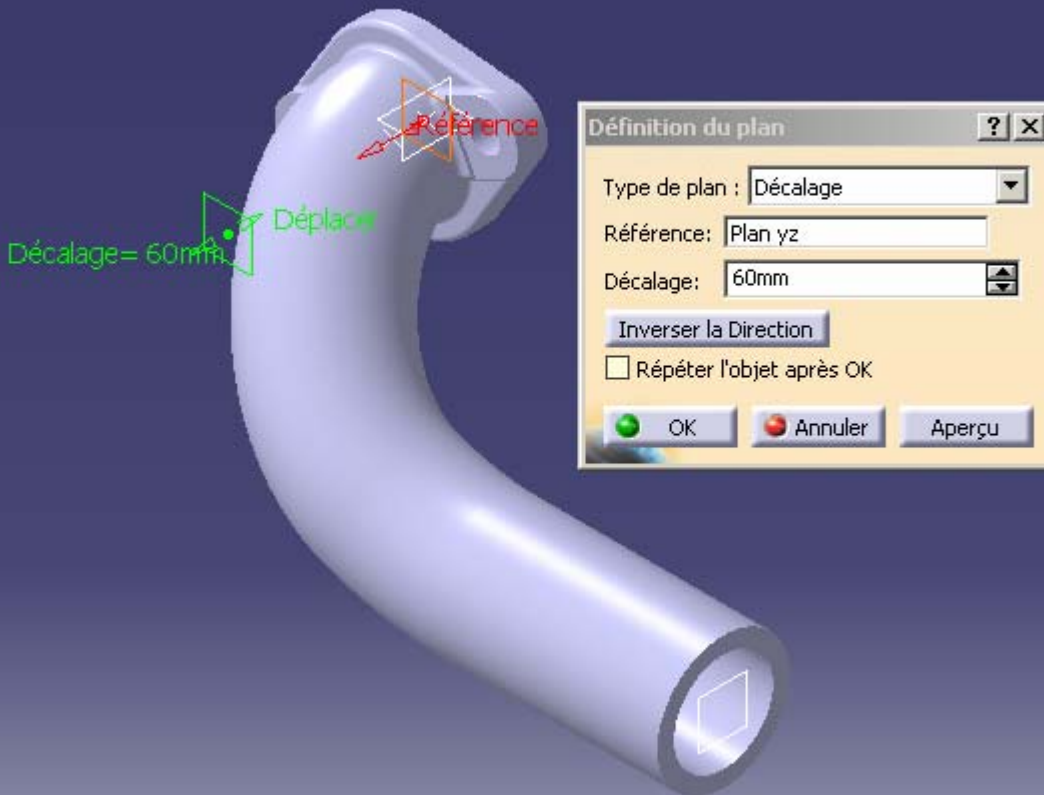
- **Use the revolve icon Set up the fillets**
- **Use Edge Fillet Icon**



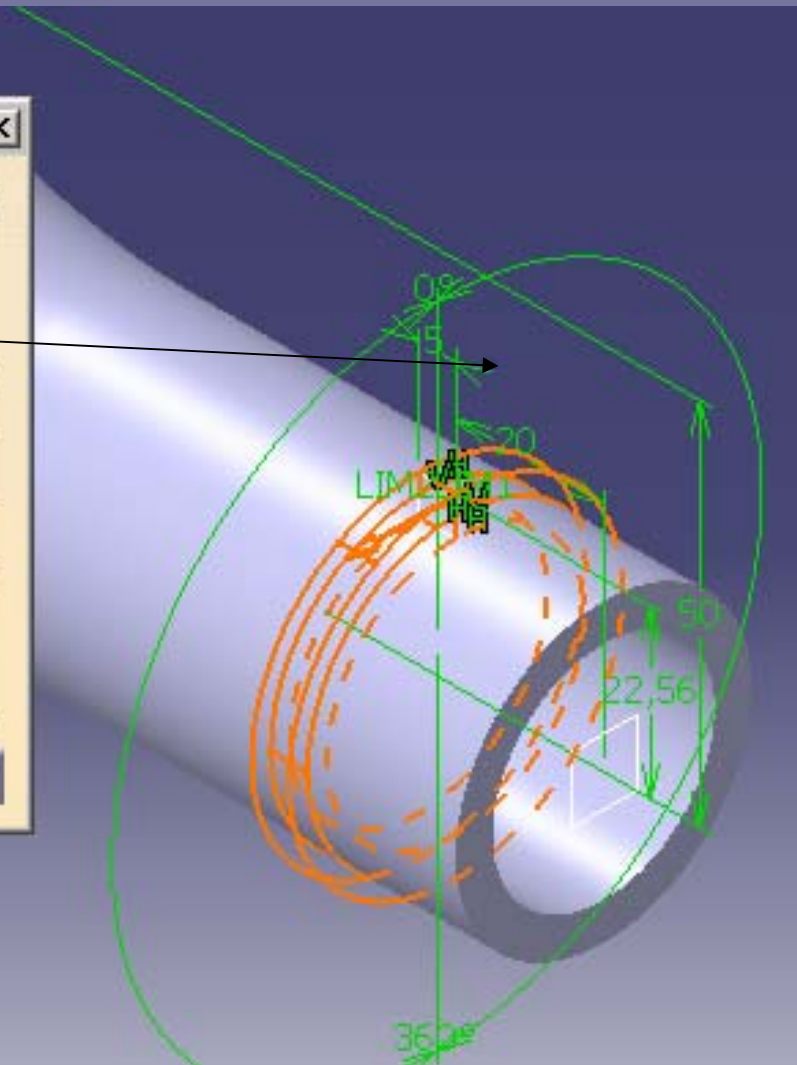
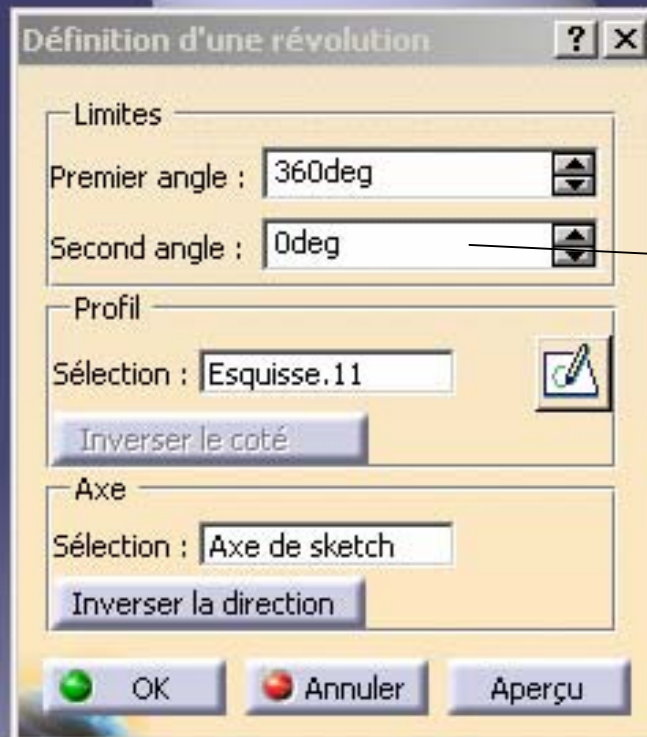
Create a plane offset by 60 mm with respect to the plane zy the machinings



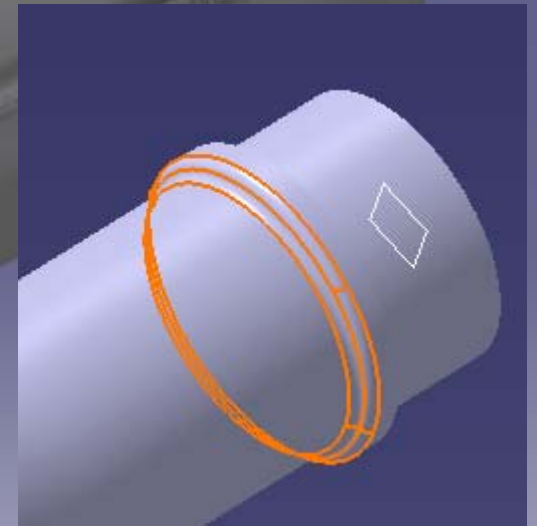
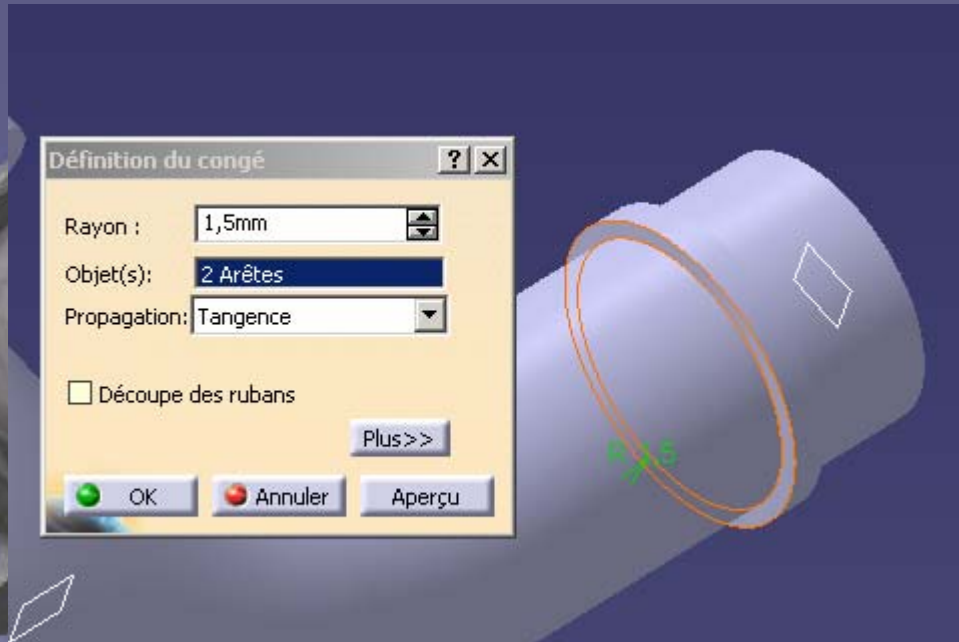
Open a sketch and draw the profile of the shoulder



360°



Create edge fillets



Rename *holidays.X* *Exhaust manifold*



FIN . . .

