

TP2-Turning

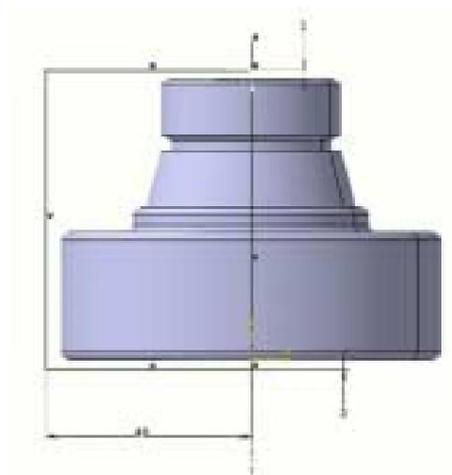
Bracket: Fitting

Objectives: generate an iso NC program from a complex part of revolution

procedure: open file: **fitting**

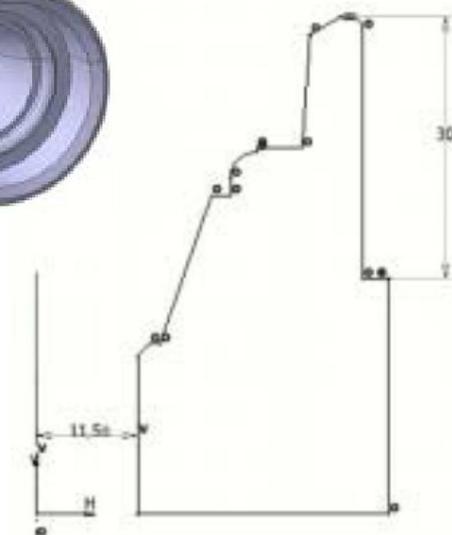
Creation of blank parts and blank

phase20 profiles - create a new part body by clicking on Insert>part body - rename the part body "**raw ph20**" (**property** >element properties) - open a sketch in the **ZX** plane - build the raw contour as in the figure (with an allowance at both ends of 2mm and a radius of 40) - make a part of revolution from this sketch. - set the transparency properties of the raw part (set to 200) - make the sketch visible - rename the sketch "**contour_raw_ph20**".



Clearance point - open sketch in **ZX** plane - construct point **X50 Z70** - make sketch visible. - rename the sketch "**point_de_degagement**".

machined part phase 20 - create a new part body by clicking on Insert>part body - rename the part body "**usinee_ph20**" (**property** >element properties) - open a sketch in the **ZX** plane - build the raw contour as in the figure



- you will use the 3D projection tools to duplicate the interior and exterior contours. - make a part of revolution from this sketch. - set the transparency properties of the raw part (set to 200) - rename the sketch "**contour_usinee_ph20**".

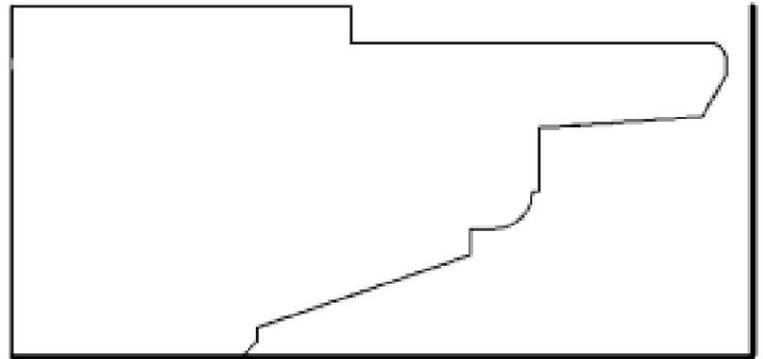


contouring profile (operation a and f) - open a sketch in the **ZX** plane - build the raw contour as in the figure

- you will use the 3D projection tools the exterior contour. - rename the sketch "**contournage_exterieur_ph20**".



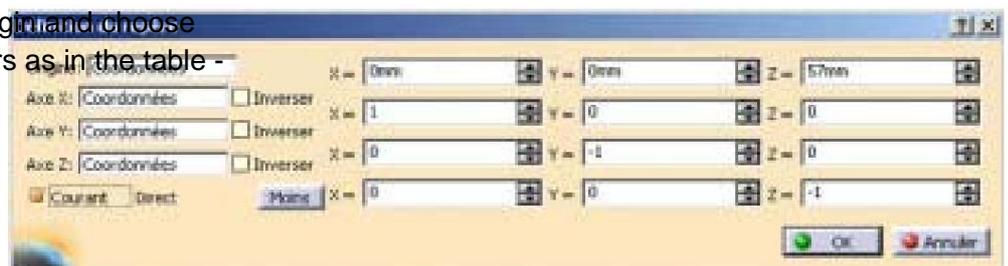
roughing profile of the bore (operation d) - open a sketch in the **ZX** plane - build the rough contour as in the figure (in heavy line) - you will use the 3D projection tools



to duplicate the contour
- rename the sketch "**contour_raw_bore**".

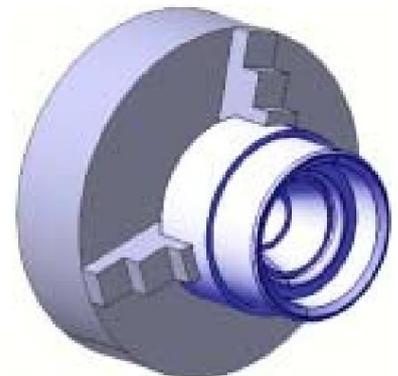
Creation of the machining reference - click on

Insert>Reference - click on the following menu: -
click with the right button on origin and choose
coordinates - set the parameters as in the table -
click on OK to validate

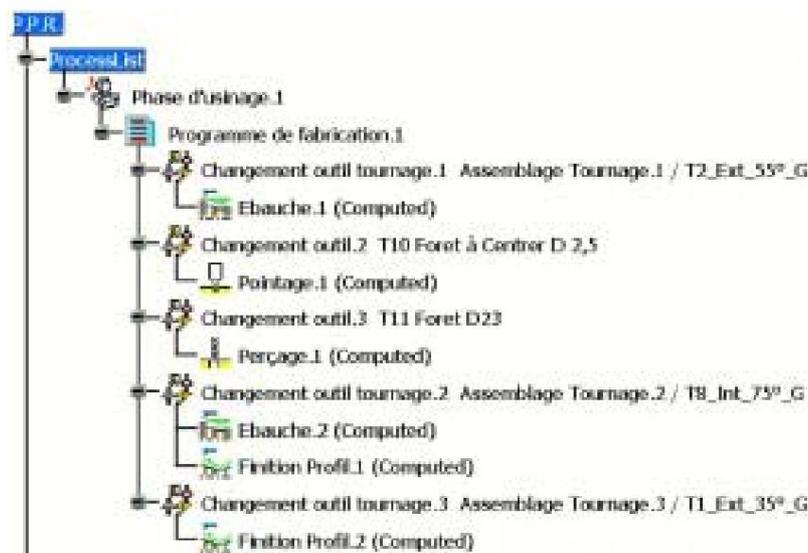


Creating the chuck-part assembly

- open a new assembly -
rename it "**Fitting_ph20**" -
insert the mandrel (fix it in the reference)
- insert the "**fitting**" - constrain it as in
the figure - save the assembly



ph20 process



Creation of the machining phase

- open the workshop by clicking on  or Start>Manufacturing by CNC> Machining on Lathes

Declaration of the geometries used for the simulation

double click  Phase d'usinage.1 in the tree.

geometry of the machined part

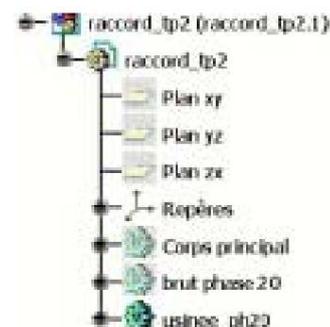
click on the dialog box that appears click «**usinée_ph20**»

body double click outside to validate the selection

geometry of the raw part click

on the dialog box that appears click «**raw_phase20**»

body double click outside to validate the selection



assembly geometry

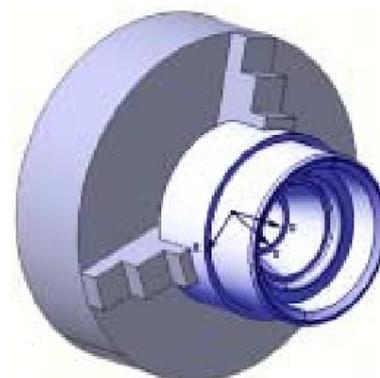
click on the dialog box that appears click in the tree on

the body **the mandrel** double click outside to validate the selection

machining mark

click on the icon 

click on one of the red zones to declare the marker click on the marker validate by clicking on OK



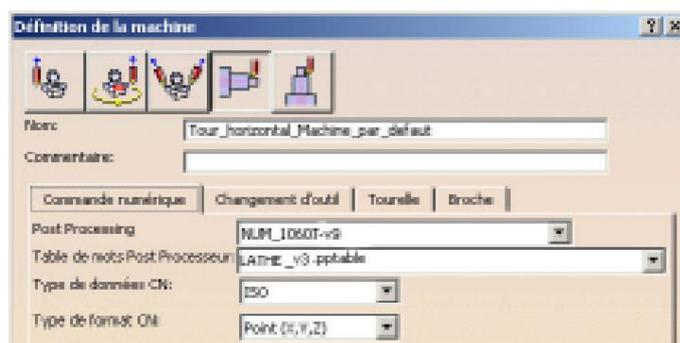
tool change position

- tool change point: **X60 Y0 Z80**

choice of machine

click on the icon 

adjust the parameters corresponding to the menu opposite validate by clicking on OK



Some tips for creating operations

Setting parameters for roughing.1



Tool selection

click on



- set tool number to **2**

Choice of tool body

click on



- click on  to choose the tool body in the «**outils_foco**» catalog

- choose tool **T2_Ext_55°_G** -

click on **OK**

Choice of insert

- click on



- click on  to choose the insert in the «**outils_foco**» catalog

- click on -



choose the **55°** insert -

click on **OK**

Declaration of contour geometries

- click on



the following menu appears

Contour brut

- click on the red zone marked "**raw**" -

click in the tree on the sketch "**contour_raw_ph20**" -

click on **OK**

Machined outline

- click on the red area marked "**room**" -

click in the tree on the sketch "**contournage_exterieur_ph20**" -

click on **OK**

- adjust the part oversize: **0.5 mm**

Machining strategy

- click on



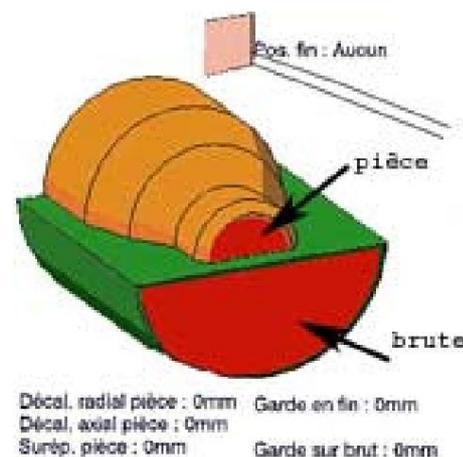
the following menu

appears - set the roughing mode to: **parallel**

contour - set the orientation mode to: **external** -

set the axial depth of cut to: **0.5 mm** - set the

radial depth of cut to: 1 mm



Approach and withdrawal of tools

click on 

- check the approach box

- click on 

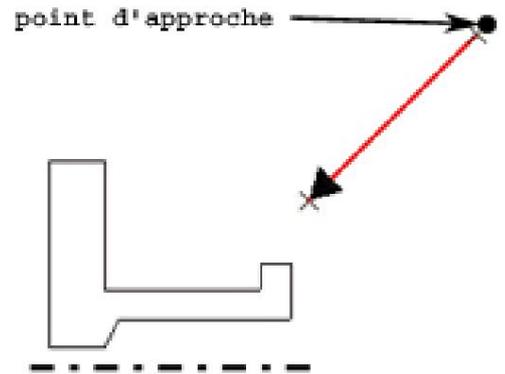
the following menu

appears - click on the point identified by

the arrow the window disappears - click on

the point sketched in the body "**point_de_degagement**" the window

reappears - tick the withdrawal box



- click on 

the following menu

appears - click on the point identified by

the arrow the window disappears - click

on the point sketched in the body «**point_de_gagement**» the window

reappears

cutting condition

- click on 

the following menu

appears - complete the gears as in the table

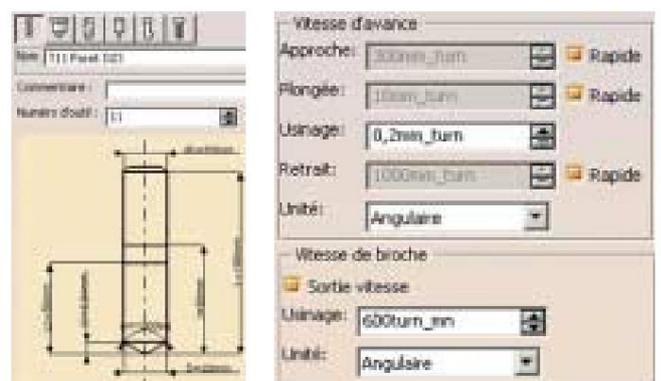
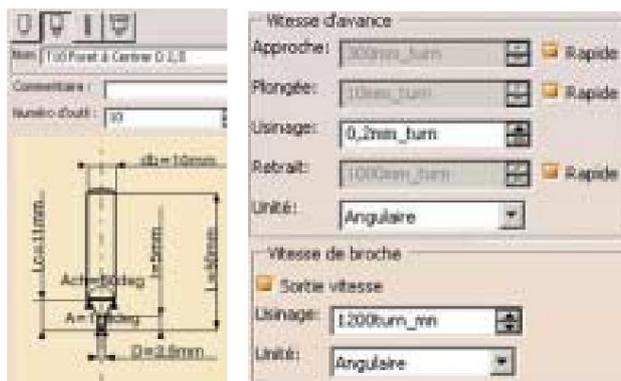
do the simulation



Create punch and drill operations

same procedure as in the milling tutorials

choice of tools



Setting parameters for roughing.2

Tool selection

click on  

- set tool number to **8**

Choice of tool body

click on  

- click on  to choose the tool body in the «**outils_foco**» catalog

- choose tool **T8_Aleser_75°_G** -

click on **OK**

Choice of insert

- click on  

- click on  to choose the insert in the «**outils_foco**» catalog

- click on - 

choose the **75°** insert -

click on **OK**

Declaration of contour geometries

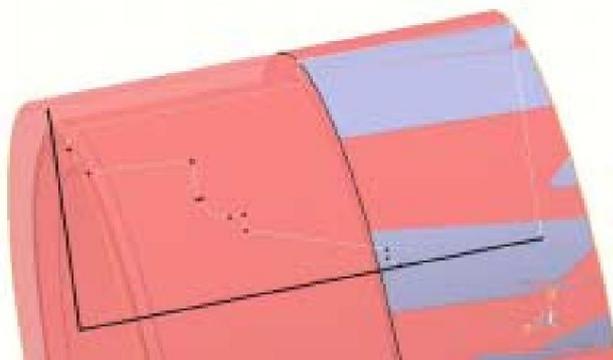
- click on  

Contour brute

- click on the red zone marked "**rough**" -

select the edges marked **with a strong** line

- click on OK



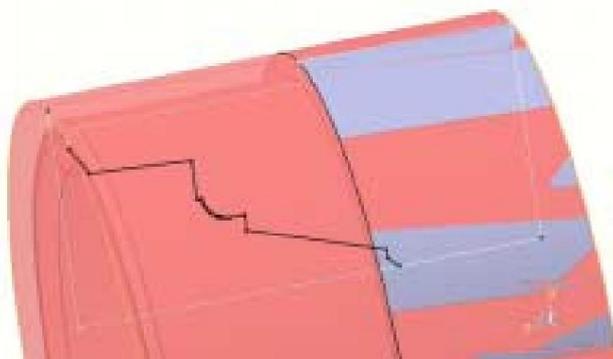
Outline of the bore -

click on the red area marked "**part**" -

select the edges marked with **a strong** line - click

on OK

- adjust the part oversize: **0.5 mm**



Machining strategy

- click on  

the following menu

appears - set the roughing mode to: **parallel**

contour - set the orientation mode to: **internal** -

set the axial depth of cut to: **0.5 mm** - set the

radial depth of cut to: 1 mm

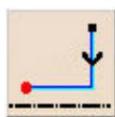
Approach and withdrawal of tools

click on



- check the approach box

- click on



the following menu

appears - click on the point identified by

the arrow the window disappears - click on

the point sketched in the body "**point_de_degagement**" the window

reappears - tick the withdrawal box

- click on



- click on the point identified by the arrow

the window disappears - click on the point

sketched in the body «**point_de_degagement**» the window reappears

cutting condition

- click on



the following menu

appears - complete the gears as in the table

do the simulation

Setting parameters for profile finishing.1

Choice of tool

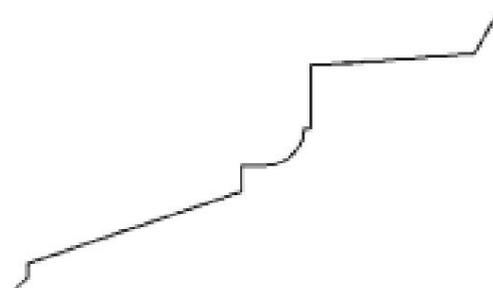
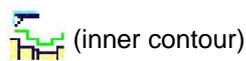
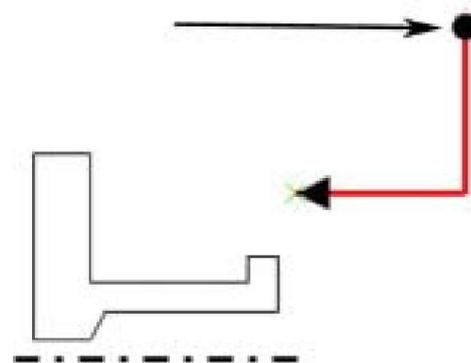
- same tool as for roughing **T8_Aleser_75°_G**

Declaration of contour geometries

- click on



Outline of the bore -

click on the red zone marked "**part**" - selectthe edges marked with a **black** line - click on OK

cutting condition

- click on



the following menu

appears - complete the gears as in the table

do the simulation

profile finish.2 (external contouring)

Choice of tool

- tool **T1_ext_35°_G**

- carry out the external finishing operation with the help of the previous steps



The image shows a dialog box for setting cutting parameters in CATIA V5. It is divided into two sections: 'Vitesse d'avance' (Feed Rate) and 'Vitesse de broche' (Spindle Speed).

Vitesse d'avance	
Engagement:	0,2mm_turn
Usinage:	0,05 mm_turn
Chamfreinage:	0,2mm_turn
Dégagement:	0,8mm_turn

Vitesse de broche	
Usinage:	400turn_mn
Unité:	Angulaire