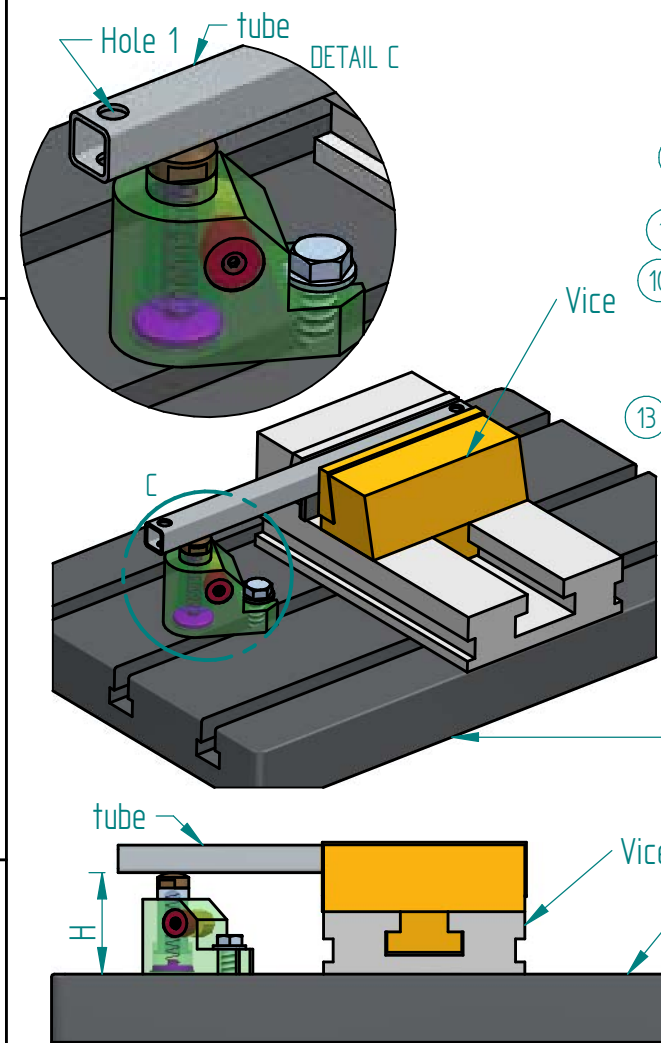
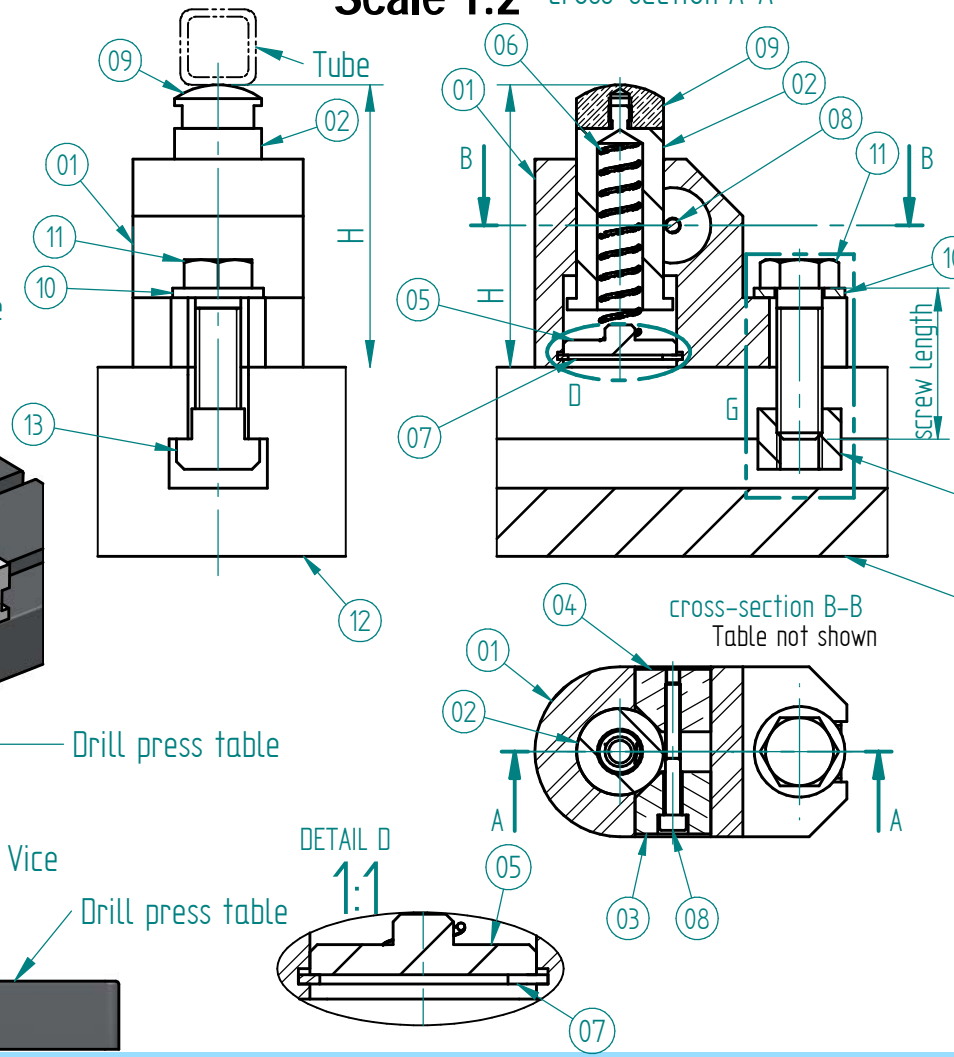


During the drilling of the hole 1 in the tube, the "drill support" prevents its yielding. The pad (09), comes under the tube to be drilled and supports it. The height H of the support may be adjusted and fixed. This tube is also held by the vice.



Assembly view Drill support

Scale 1:2 cross-section A-A



Mechanical design exam S1 (1h)

Drill support

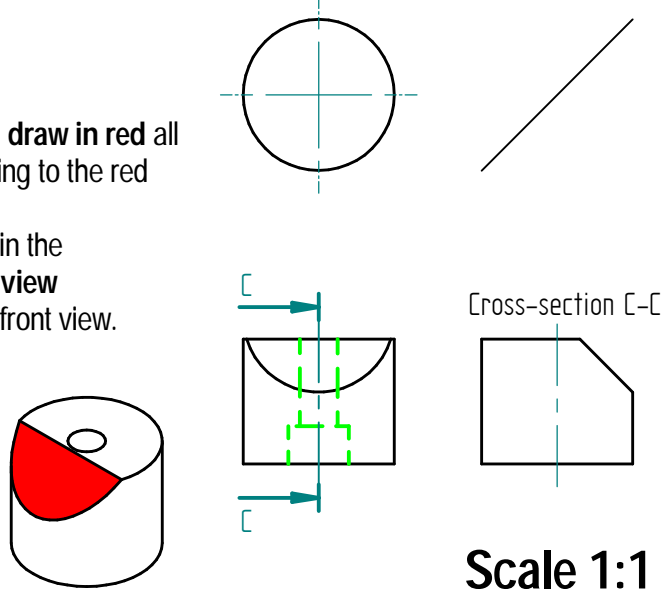
NAME :
 First name :
 Group :

2 : drawing of a part (~3 pts)

Fixing pad

To do in the drawing on right :
 J - In the three views of the drawing, **draw in red** all the visible and hidden edges belonging to the red surface in the perspective
 K - Draw in green adequate shapes in the **cross-section C-C** and the **bottom view** representing the green shape in the front view.

L - What is the name of this part ?
 (cross-out the wrong answer)
 fixing pad n°1
 fixing pad n°2



Scale 1:1

3 : Bill of parts (~2pts)

I - Fill-in the missing information in the bill of parts in the description and material columns.

14	1	Tube	Steel	
13	1	T nut	-----	
12	1	Drill press table	Steel S235	
11	1	Screw H M12-40-35	Steel	
10	1	-----	Steel	
09	1	Pad	-----	
08	1	Screw CHc M4-35-20	Steel	
07	1	-----	Steel S235	
06	1	Spring	Spring steel	
05	1	Lid	Steel S235	
04	1	Fixing pad n°2	Bronze, 90%	
03	1	Fixing pad n°1	Bronze, 90%	
02	1	Support	Steel S235	
01	1	Body	-----	
Rep	Qté	Description	Material	Comments

1 : Understanding the mechanism (~5 pts)

- A - Cross out the **wrong statement** :
 - the drill support blocks the tube during the drill operation of the hole 1
 - the drill support props up the the tube during the drill operation of the hole 1
 - the drill support enables to adjust the tube during the drill operation of the hole 1
- B - Provide the **numbers of parts** which would participate in carrying the load of the drilling (i.e. come under stress due to drilling)

- C - What is the reason for a counter-bore in the **part (03)** ?
- D - We use the **screw (08)** to fix the height H, what tool should we use to tighten it ?
- E - What is the use of the **spring (06)** ?
- F - What is the fonction of the **part (07)** ?
- G - The **screw (11)** is not sufficiently well screwed into the **T nut (13)** - see cross-section A-A. Provide a new screw length enabling the adequate joint between the screw and the nut. The length of the screw is shown in the detail view G.
 New "screw length" = mm
- H - What tool should be used to tighten this **screw (11)** ?
- I - Fill-in the missing information in the bill of parts in the description and material columns.

Mechanical design exam S1 - 2022

Drill support

1

Format
A3H

Feuille : 1 / 2

Date : 11/12/2022

Dessiné par : A. Toumine, Y. Ricotti

4 : Definition drawing (~5 pts)

M - Provide a name and a function of the **shape I** situated on the Pad (09) :

N - A surface is coloured in red in the perspective of the Pad (09).

Draw construction lines enabling to place this surface on the three views of the Pad (09).

O - Fill-in the blue boxes below with an adequate **technical vocabulary**.

P - **Measure the missing cotes** in red and place them in the red boxes below.

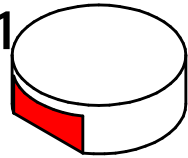
Q - Stroke of the support : it is the difference between the maximum and minimum value of height H.

Determine the value of this stroke from the assembly drawing, **Stroke** = mm

R-R' - Count the number of elementary surfaces of the Pad (09) and the Support (02) and fill-in the appropriate tables>

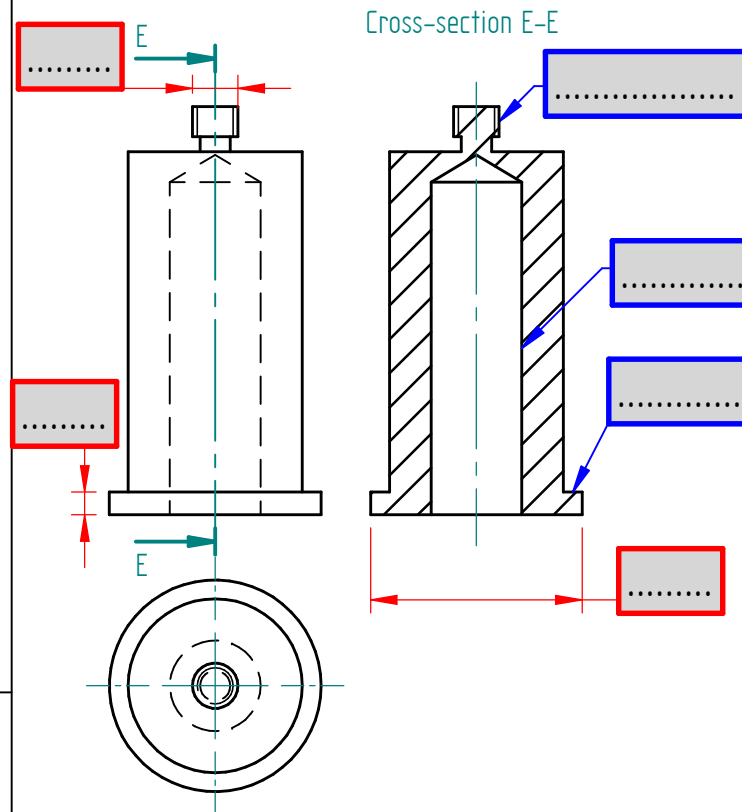
Pad (09)

Scale 1:1



Support (02)

Scale 1:1

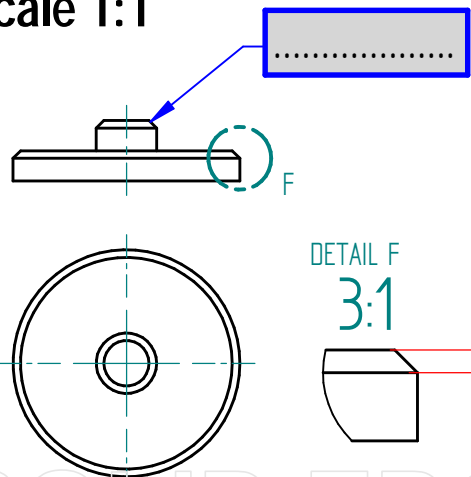


R - Number of elementary surfaces

Planar	Helicoidal
Cylindrical	Spherical
Conical	Toroidal

Lid (05)

Scale 1:1



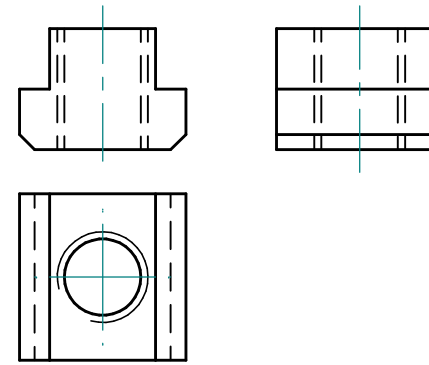
R - Number of elementary surfaces

Planar	Helicoidal
Cylindrical	Spherical
Conical	Toroidal

5 : Perspectives (~5 pts)

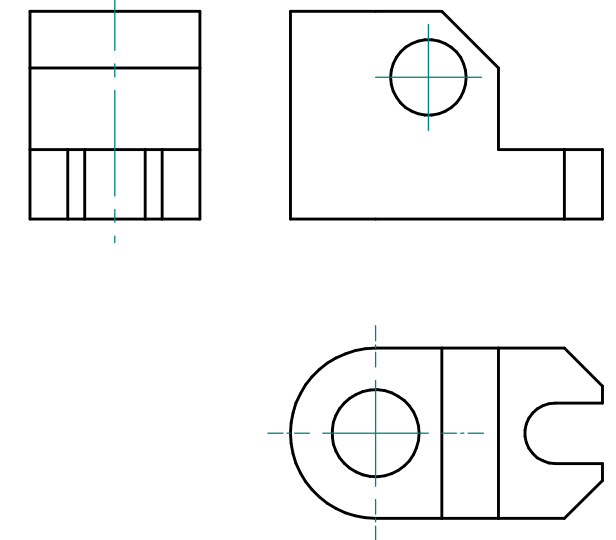
T nut (13)

Scale 1:1



Body (01)

Scale 1:2



S - Using the provided views, draw the appearance of the following parts freehand:

- the T-nut (13) in cavalier perspective.

- the body (01) uncut in isometric perspective.

do not draw hidden edges

choose an orientation that allows you to clearly define the shapes of the parts

NB: You will choose a relevant scale that allows you to represent all the shapes of the parts while respecting their proportion. Regular and isometric grids are provided below to help.

