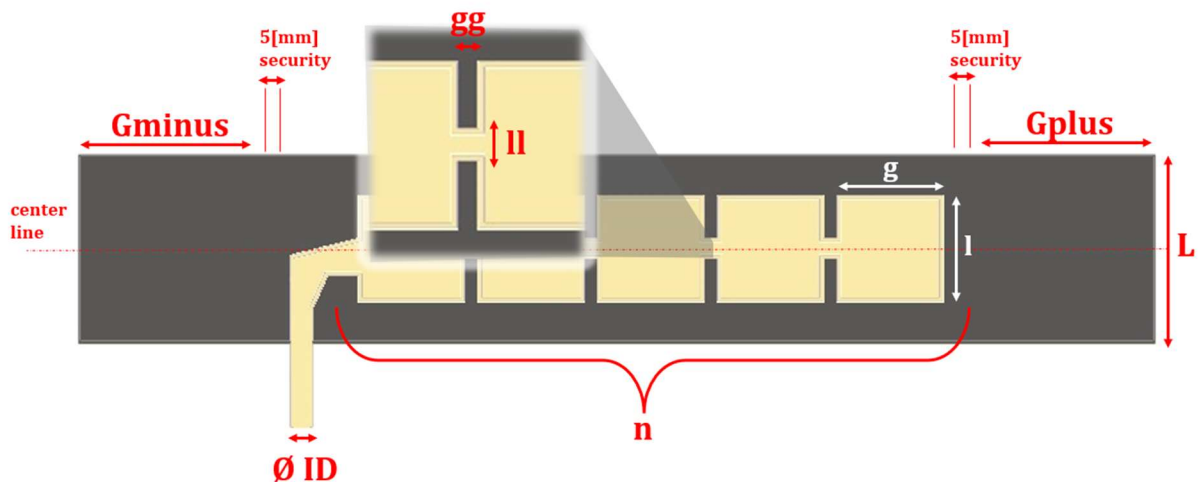


Step 1 : design your band

Using main.py, define the desired parameters:

```
#####  
#                                     #  
# * Run this file to generate your pneumatic band * #  
#                                     #  
#####  
  
# imports  
from IPCdevice_designer_v2 import draw_svg  
from IPCdevice_designer_v2 import write_info  
from IPCdevice_designer_v2 import gauge_value_chart  
  
# specifications (to fill by hand)  
n = 5 # pouch number [mm]  
ID = 4 # inner diameter [mm]  
l = 30 # pouch width [mm]  
g = 30 # pouch length [mm]  
L = 60 # global width [mm]  
ll = 5 # interconnection width [mm]  
gg = 5 # interconnexions length [mm]  
Gplus = 60 # additionnal length [mm] (end)  
Gminus = 60 # additionnal length [mm] (beginning)  
temperature = 200 # heating temperature [Celsius]  
duration = 45 # heating time [s]
```

With the geometrical paramters defined on the figure below. Duration and temperature depends on the desired fusion protocol for the given band and do not influence the design files generation.



Step 2 : give it a nickname

The name of your band will be automatically defined. To ease the identification of the band during discussions, a tag can be chosen before generating the files :

[n - ID - l - g - L - ll - gg - Gplus - Gminus]_tag




tag = '_'+'StandardL'

Step 3 : generate your files









Run the main script to create your files.

Step 4 : find your files

After the run, a folder with the name of your band + "_FOLDER" is automatically created in the same repertory as the main.py script.

 [5-4-30-30-45-5-3-5-5]_failedL_FOLDER	20-04-23 16:57	Dossier de fichiers
 [5-4-30-30-60-5-3-5-5]_robust_FOLDER	21-04-23 14:01	Dossier de fichiers
 [5-4-30-30-60-5-5-5-5]_standard_FOLDER	20-04-23 16:59	Dossier de fichiers

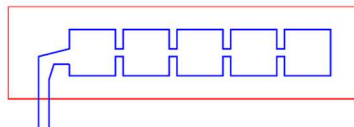
In the folder, all the needed files are labeled by the name of the band in case they need to be exported out of their initial folder.

Nom	Modifié le	Type
 [5-4-30-30-60-5-5-5-5]_standard_global_render.svg	20-04-23 16:46	Fichier SVG
 [5-4-30-30-60-5-5-5-5]_standard_heat_sealable_layer(...	20-04-23 16:59	Fichier DXF
 [5-4-30-30-60-5-5-5-5]_standard_heat_sealable_layer(...	20-04-23 16:46	Fichier SVG
 [5-4-30-30-60-5-5-5-5]_standard_INFO.txt	20-04-23 16:46	Document texte
 [5-4-30-30-60-5-5-5-5]_standard_intermediate_layer(1...	20-04-23 16:59	Fichier DXF
 [5-4-30-30-60-5-5-5-5]_standard_intermediate_layer(1...	20-04-23 16:46	Fichier SVG
 [5-4-30-30-60-5-5-5-5]_standard_metalpatron_inner.svg	20-04-23 16:46	Fichier SVG
 [5-4-30-30-60-5-5-5-5]_standard_metalpatron_outer.s...	20-04-23 16:46	Fichier SVG

Among the different files, you will find :

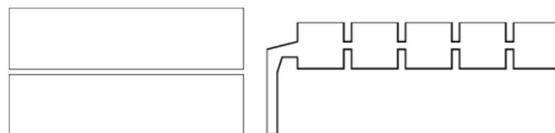
A global render of the band

To verify that the design is correct at first sight. The file is of .svg format.



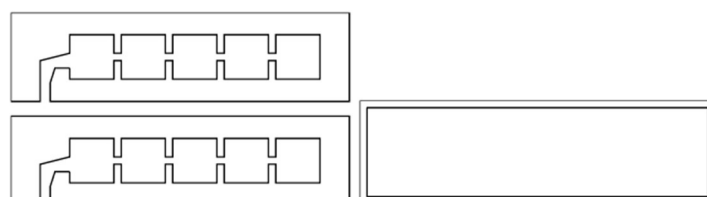
The distinct cutting files for the heat-sealable layers and the intermediate layer

WARNING: You will need to convert the .svg files to .RXF in order to use them with a laser-cutter.



A first design of a metal-stamp: metal_patron files

They were never tested, but they aim to create a metal stamp to remove the ned of a non-stick layer inside the band.



An info file that resume all the information about the band

The INFO.txt file is the key of the band identification system. It contains everything that is needed to accelerate the fabrication process and to use the band for testing.

```
[5-4-30-30-60-5-5-5-5]_standard_INFO.txt - Bloc-notes
Fichier Edition Format Affichage Aide
WARNING: SVG has to be converted to paths before being converted to RXF for laser-cutting.
        For better cutting, you can combine the curves using the cutting program.
Tips: The ID of the band is structured as follow
      [n - ID - l - g - L - ll - gg - Gplus - Gminus]_tag
=====

Design specifications
- Reference ID: [5-4-30-30-60-5-5-5-5]_standard
- Input diameter: 4mm
- Number of pouches: 5
- Dimensions of a pouch: 30x30mm
- Dimensions of the band: 230.0x60mm
- Distance between each pouch: 5mm
- Inner tube width: 5mm
- Additionnal length at the beginning of the pouch-chain (air input to the left): 5mm
- Additionnal length at the end of the pouch-chain: 5mm
- Elbow dimensions: 20x50mm
Others
- TPU Textile dimensions needed for the 2 heat_sealable_layers: 230.0x125mm
- Baking paper dimensions needed for the intermediate_layer: 190x72.5mm
- Nyamara Volume of the band: 31746.77420681033mm3
- Nyamara Volume of the band considering interconnections: 31864.35485202074mm3

NB: The id-box dimensions needed for laser-cutting are written at the end of the filenames.
NB2: Depending on the material used, it can be a retraction of the fabric during the laser-cutting.
      Take that in account while setting your parameters.

Additionnal information on the fabrication process, handwritten
- Material: One-sided TPU coated Textile (70d)
- Fusion process parameters: T=200Celsius, t=30s (set to 200C, 30s default for TPU)

Other notes, remarks..., about [5-4-30-30-60-5-5-5-5]_standard
*****

*****
```

This file contains :

- A detailed listing of the band design and fusion
- The pre-cutting dimensions needed for the materials to be put in the laser-cutter, ensuring a 5mm security and therefore minimizing material and time loss.
- Estimation of the band volume for a 45 tangential angle using the pouch model of Niiyama et al.
- Other information such as the fusion protocol wanted that can be customized in the code before generation.