SUMMARY

This project is based on an imaginary firm which has a labour health’s problem; the high sound potency that a mechanic press of large tonnage emits.

First of all, we have done an explanation about which is the sound, how it spreads through the air and the three magnitudes that can be used to define the wave’s amplitude:

- **Pressure** \( (P) \)
- **Potency** \( (W) \)
- **Intensity** \( (I) \)

Next, we talk about noise, defined as an emission of energy originated by a vibratory phenomenon that generates annoyance or discomfort to the receptor of this energy.

According to the time interval and the repetitions it has, as we can see in the picture, it can have different denominations:

After that, we talk about the noise levels and how them can affect the human hearing with more or less seriousness.

Once we know which is the noise and how it acts, we make an explanation about the definition of decibel (dB), weighted decibel (dbA) and their differences.
The first magnitude, the decibel, was been used because the range of the human hearing in Pascal is very extensive. So, appealing to a logarithm scale which makes more comfortable the manipulation of its values, it was used the decibel.

Another characteristic of the human hearing is that it has not the same sensibility for the different frequencies, that is, for the same level of pressure, a noise can be equal or more annoying when it increases the frequency level.

For this reason, when the acoustic measures are done, we have used a type of filters that attenuate the low frequencies, permitting that can be reflected the representative noise level that the human hearing perceived and, in this case, when the measures are given with the magnitude (dbA).

Once the noise levels and its characteristics are mentioned, we talk about how the obstacles affect the spread of the sound. In this case, we are centred in the two characteristics that are more interesting for us in this project: absorption and isolation.

The acoustic absorption is the property the solids that have to absorb the sound waves decreasing the rebound of these. The isolation is the property of the solids that exercises as a barrier of these waves, avoiding that these can transfer this body.

When all the explanations about the noise and sound are done, we have represented our case with a brief explanation of the labour security about acoustic theme, the normative, the security and the bad effects on health.

Later, we have done an analysis about the characteristics of the press, the dimensions, the performance and how it is fed with the material.

Next, we have realized a sound study where we can appreciate about which noise we are talking, the highest level (highest magnitude that can be obtained in the study) and the equivalent level of noise: where we see that the highest level is 94dbA and the equivalent is 90dbA.

Once we know what features we find, we proceed to do the structure’s design, choosing the sandwich panels of wool rock to do the recovering structure of the press.
The panel features were obtained in the data sheet of the manufacturer, so we are focused in make the cabin's design.

For that, we have used different straight panels of 1,40m long and 8m high. We have designed corner panels to make the assembly, and we have designed lower and top supports to be anchored to the ground and between them.

This type of assembly was designed and drawn entirely with Solidworks and it has been focused on trying to facilitate to the worker the manipulation of the mechanic press and in the precise case, the assembly and dismantling of the cabin.

When the assembly of the cabin is designed and done, we have incorporated some extras as acoustic viewfinder, acoustic doors and two cuts on the sides (one for the strap entry and another for the exit of the printed product).

To prove the efficiency of this cabin, we have done the calculations that prove that the cabin has capacity to reduce the acoustic level of the press, from 90dbA to 59,5dbA, when you are only in one metre of the panel of the cabin.
All this design has its plans in the annex (at the end of the memory), and we can find an approximated budget of the cost of the realisation of this project.