

MAKING AN ACOUSTIC ENCLOSURE

→ 1st step : Noise nuisance assessment

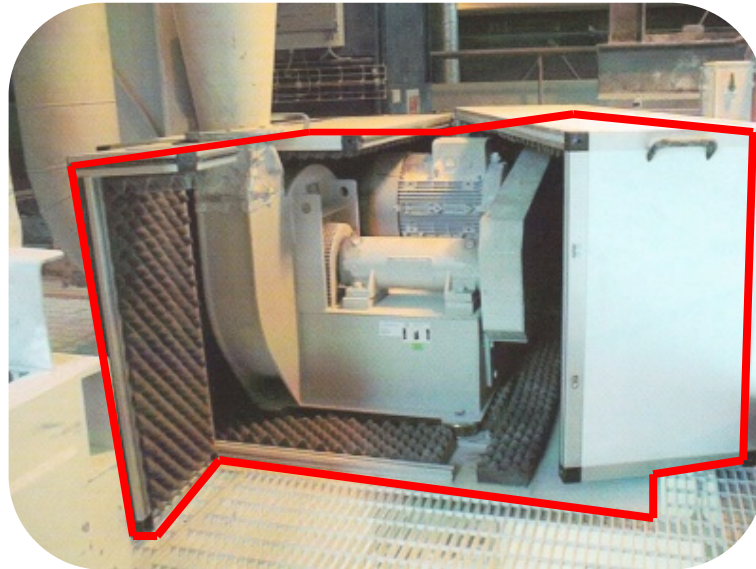


BK 732 sound level meter

Digital sound level meter that allows a quick and reliable diagnosis of sound environments

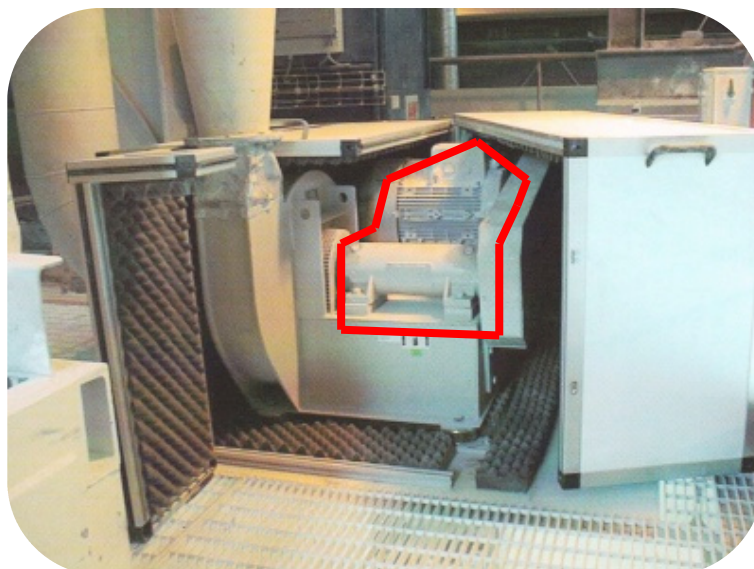
- Through a sound level meter, assess the sound level of the machine to be enclosed (sound level meters available at [solutions elastomères](http://solutions-elastomeres.com)).
- To do it, put the device 1 meter away from the machine and at a height close to the ear's level.
- Note down the medium level registered in dBA and remember on a plan the exact place where the measurement has been made.
- For information : 0 dBA = minimum level perceptible by human ear-130 dBA = maximum level bearable (jet plane take-off)
- You can also request noise cartography in your premises by an approved body (the cost of such a service is generally high...).

→ 2nd step : Determine the necessary acoustic enclosure



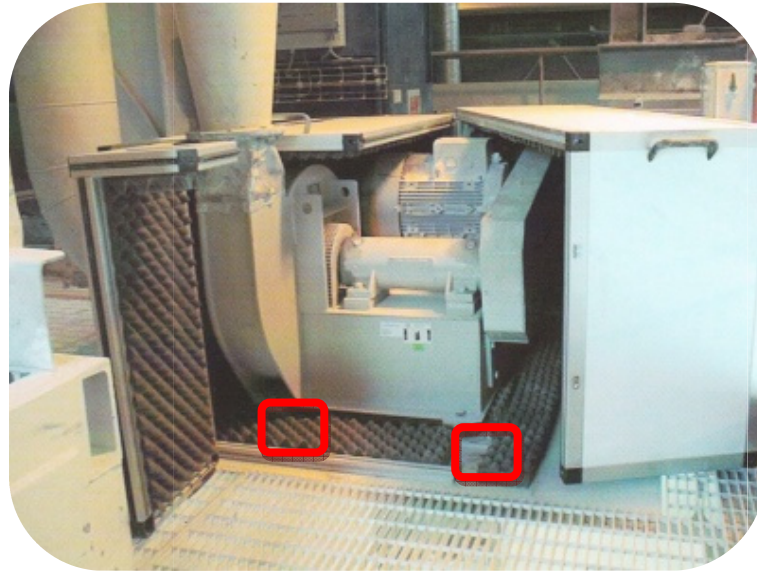
- In most cases, a simple acoustic enclosure, made by your good offices and following a right methodology, is enough to reduce noise nuisance at levels accepted by legislation in force.
- However, if it is about huge facilities, strongly noisy machines that give out heat, it will be suitable to entrust an approved specialist with the acoustic enclosure (cabinet specialize in acoustics, Technical Center of Mechanical Industries...).
- The cost of a “scientific” study or achievement will be naturally higher than a machine enclosure made by your good offices!

→ 3rd step : Hang up the vibrating elements



- Systems are generally made up of « active » elements (engines, transmissions, mechanisms...) and « passive » elements (metal sheets, assemblies...). It is essential to make sure that noisy and vibrating elements (active) are properly hanging and do not cause vibrations of « passive » elements (noise of the metal sheets, banging...).
- If that is the case, you may have recourse to rubber suspensions to insulate the vibrating elements (see our « Anti-Vibration » range).

→ 4th step: Disconnecting the machine from its support

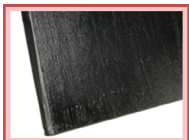
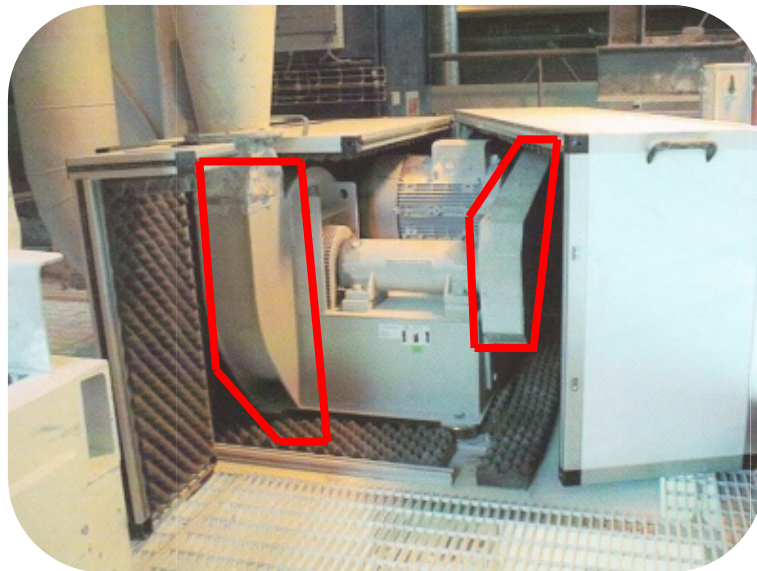


SE110 high performance support

Vibration reduction $\geq 90\%$
from 1,500 tr/mn (25Hz).
From 4 up to 1,350 kg per support

- It is good to know that the enclosure of a not correctly hanging machine is quite inefficient because the vibrations transmitted to the support (ground, slab...) always result in indirect sound effects.
- Different supports belong to the « anti-vibration » product family and allow covering a wide range of masses, frequencies and machines.

→ 5th step : Eliminate the vibrations of thin metal sheets

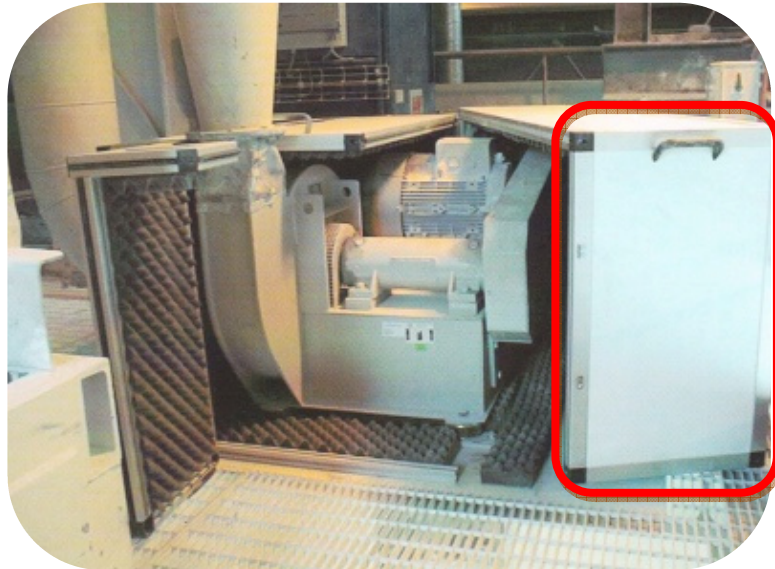


Bitumen heavy masses

The heavy mass range is made up of viscoelastic bitumen masses, used to deaden vibrations and provision of mass in the building sector or in the industrial environment.

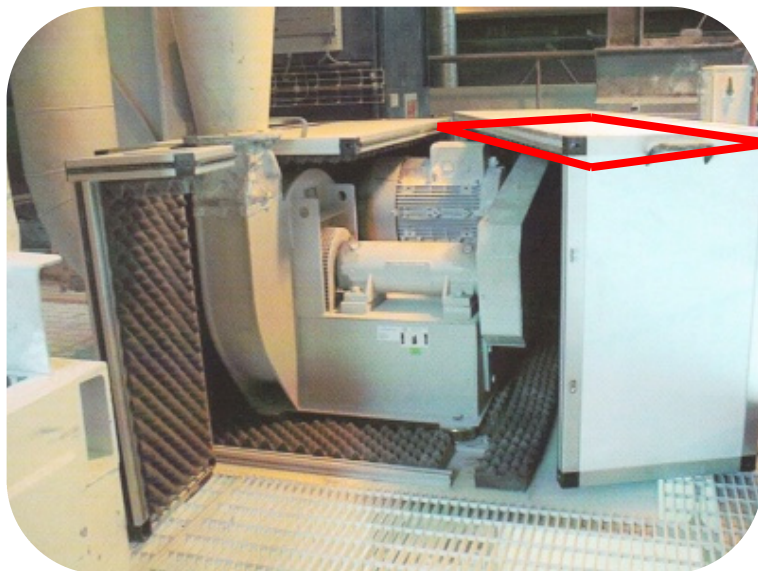
- The vibrations created on thin metal sheets by the « active » elements result in high sound levels, which can be easily eliminated (gong or cymbal sound effect after a shock: the structure vibrates and may produce sounds during a variable time!).
- Stick the bitumen heavy mass plates (in stock within **Solutions Elastomères**) in the center of the vibrating thin metal sheets.
- This technique, very widespread within plumbers, is used under stainless steel sinks of collective buildings in order to avoid transmitting water noise through pipes.

→ 6th step : Choose the type of plastic panels



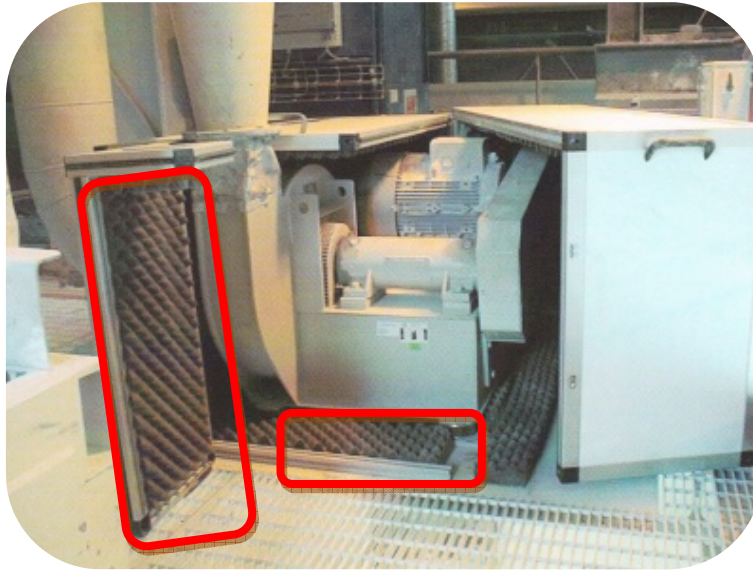
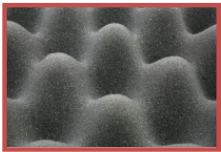
- Several plastics can be used to realize enclosures (massive PVC, expanded PVC, polyamide, polyethylene ...).
- Your choice should take into account the following elements: density for phonic efficiency, aspect, color, mass and cost.
- Our cutting workshop will realize these panels according to your requirements and plans.

→ 7th step : Plan glass surfaces (if necessary)



- Although they don't represent an ideal solution from an acoustic point of view, the transparent surfaces are often necessary to control the good functioning of the machines.
- The most suitable material, from a security point of view is the transparent colorless polycarbonate (quite unbreakable).
- If you opt for sliding windows, do not forget inserting a cell rubber strip between them to avoid spreading noise through free spaces.

→ 8th step : Choose a suitable acoustic foam



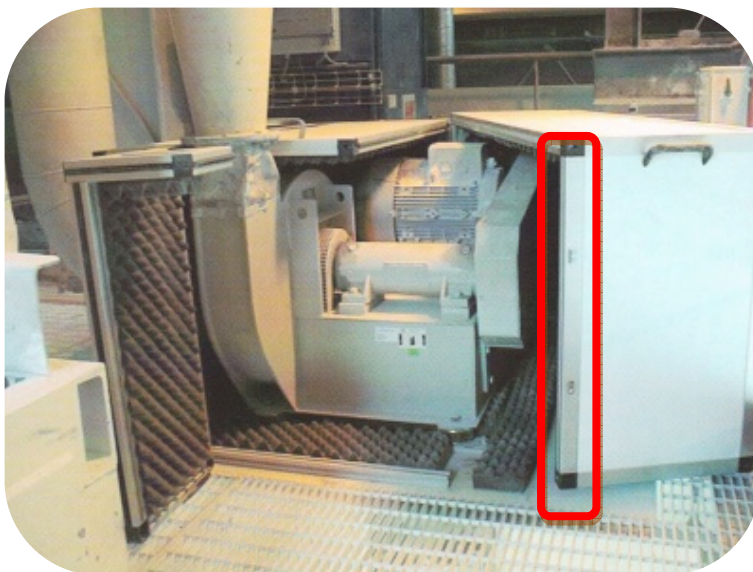
Acoustic foams

PU or rubber foams according to your applications.

M1 fire classification according to your references.

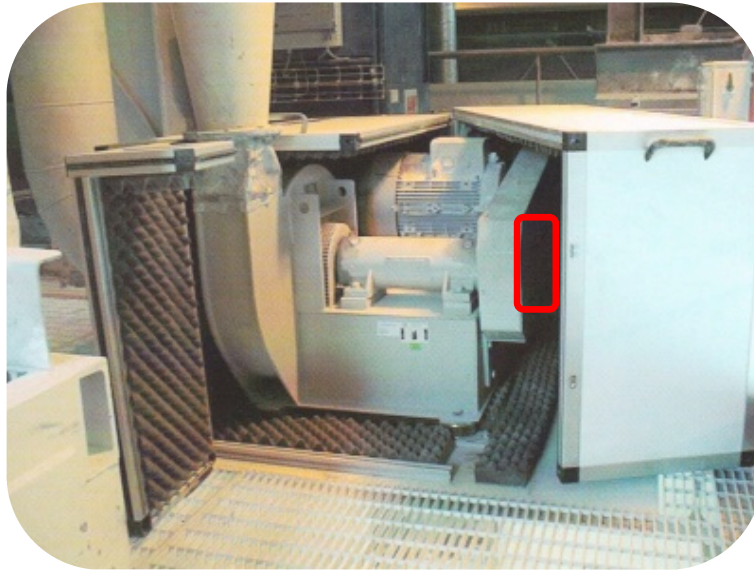
- We suggest you a huge number of technical foams, in different sizes: 2,000 x 1,400 mm; 1,500 x 1,000 mm; 2,000 x 1,000 mm, 1,000 x 1,000 mm with or without adhesive. We can also provide other references, delivered in rolls.
- Your choice will be conditioned by the level of expected phonic results, the type of surface (honeycombed, simple or with a protective film), the acceptable maximum thickness and the available budget.
- If the frequency of sound emission is high (from 2,000Hz), the absorbent should be thin. If the frequency is low (under 500Hz), the absorbent should be thick.

→ 9th step : Carry out the enclosure's structure



- Several users choose the aluminum profiles that are light, adjustable and aesthetically pleasing.
- Different companies are able to deliver these sets, precut or premanufactured in kit form and according to your sizes.

→ 10th step: Think about your machines's ventilation



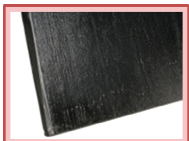
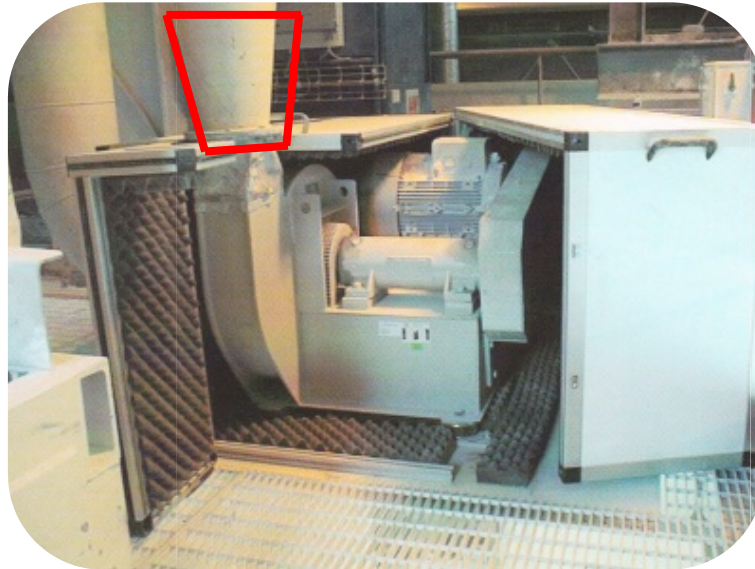
- An acoustic enclosure creates a thermal insulation chamber that may lead to some disfunctionings.
- Provide, if necessary, some natural ventilation points where « acoustic leaks » are lower.

→ 11th step : Seal shaft outputs



- Do not forget insulating the inputs/outputs of your enclosures (electric shafts, material supply...). To do that, use adhesive cell rubber strips (available in rolls), which are easy to put in complex forms.

→ 12 step : Check rigid links



- The internal vibrations of machines can be directly transmitted to rigid links (metal shafts, cables...); this is why it may be necessary to seal them to avoid their sound emissions (drum effect).
- You can also opt for bitumen heavy mass plates or cell rubber plates.
- If temperature exceeds 80°C, you can opt for cell silicon plates.

→ 13 step: Measure the enclosure's efficiency



- Once the enclosure realized, carry out an assessment of noise nuisance in the same conditions as those described in the 1st step.
- Results are often spectacular. Do not forget checking each corner of your enclosure because some « leaks », considered as minimal can damage the theoretical result.
- Do not hesitate to contact us for further information!