

# Behaviour at high and low frequencies

Structure-borne noise is that which is transmitted through the structures of a building, machine, installation... This radiation noise becomes airborne noise.

Low noise frequencies are those that are usually less damped in the air and are therefore better transmitted through structures. The range of low frequencies is between 20 and 500 Hz.

## NATURAL FREQUENCY OF THE AKUSTIK+SYLOMER® MOUNTS

The akustik+sylomer® ceiling mounts can obtain very low natural frequencies of up to 7 Hz at the optimal loading point. At this loading point the decoupling frequency of the akustik+sylomer® mounts is 9,9Hz. Such a low natural frequency is optimal for the false ceilings of soundproofed premises. This type of suspensions are also particularly interesting for the isolation of machines or vibrating elements that work at more than 600 rpm.

Examples are:

- Ducts / pipelines:
  - Of cooling liquids from refrigerating compressors, and are ideal for use in supermarkets, the frozen food section.
  - Air conditioning.
  - Pumping of water
  - From fume exhausts.
- Suspension of air conditioning machinery.
- Suspension of vibrating elements in general.

## BEHAVIOUR OF THE AKUSTIK+SYLOMER® MOUNTS AT LOW FREQUENCIES IN SOUNDPROOFED PREMISES.

The range of audible frequencies in the human being may vary according to age and to other factors although in general it is between 20 Hz and 20.000Hz. By way of example the notes produced by a guitar have a frequency range from 82 to 698 Hz.

Considering that the most unfavourable excitation frequency, i.e. 20 Hz, the isolation degree of structure-borne noise produced by an akustik+sylomer® suspension would be close to 90%. (\*)

(\*) Installation of the optimal loading point of the akustik + sylomer for a theoretical single mass spring system.

## BEHAVIOUR OF THE AKUSTIK+SYLOMER® MOUNTS AT MEDIUM AND HIGH FREQUENCIES.

Sound waves are not comprised of just one frequency, but rather of a set of frequencies superimposed without any order, which is the main reason why noise is unpleasant. Thus, the ideal suspender must be able to isolate the broadest possible range of frequencies.

**Behaviour of a metal spring:** These suspenders are often recommended for the elastic suspension of false ceilings. It is important to know that this type of mount is suitable for the damping of low frequencies, whereas the high frequencies are propagated through the coils of the spring. To filter this type of frequencies the springs must be combined with a stage of viscoelastic material under the spring to stop the propagation of this type of vibration.

**Behaviour of the akustik+ Sylomer:** Thanks to the viscoelastic properties of the Sylomer, the akustik+Sylomer has a behaviour similar to the spring at low frequencies and at the same time not only prevents the high frequencies as occurs in the spring via its coils, but also considerably improves the behaviour of the rubber at high frequencies. These results are shown in the comparative section of Akustik + Sylomer with regard to rubber suspenders.