

Insulation

Thermal insulation

The heat exchange that occurs through the interior wall between two neighbouring facilities is measured by a coefficient known as the global heat exchange coefficient and is expressed as $W/m^2 \cdot ^\circ C$. It is derived from the new RT2000 thermal regulations

This coefficient is required to calculate global losses for the facility and to properly dimension the air-conditioning system (heating, cooling) depending on the ambient conditions that are required for the clean room. Therefore, a good heat insulation solution must be found (with a low U_c measurement) in premises where ambient temperatures are often low.

The selection of insulating materials is important in cases of significant temperature differences at various points of the partition wall. Thermal bridges must be avoided especially during periods of high levels of humidity to prevent condensation that causes potential corrosion and contamination.

Acoustic insulation

Acoustic insulation must be distinguished from acoustic correction. The first involves the transmission of noise from one facility to another, while the second treats the propagation of noise inside a room and its reverberation time.

Acoustic insulation :

The important factor involving noise is the type of noise emitted because it affects the level of noise received inside a building. Thus it is that sounds composed of low frequencies such as traffic noise are more difficult to insulate.

The acoustic quality of a partition wall is determined by its sound attenuation index R_w , expressed as a physical measurement in decibels. But its analysis must without fail take into account the type of frequencies. A partition wall could have a good high frequency performance and prove to be ineffective for low frequencies.

We would advise the use of composite material walls with a mineral wool core whose mass-spring-mass resonance level attenuates the transmission of noise from one side to the other of a partition wall.

Acoustic correction :

Depending on the type and state of the surface of a facility, it is possible to affect the volume of sound energy absorbed or reflected by the interior walls.

The most «absorbent» materials have irregular or perforated surfaces quite incompatible with cleaning and decontamination conditions obligatory for white rooms. The noise must therefore be limited from the start by a material that has a good sound attenuation level or by a lining. The problem of acoustic reverberation can also be attenuated by fitting acoustic baffles or hanging absorbent panels from the ceiling of the facility in question.

Anti-vibratory insulation

Vibration transmitted by interior walls is taken very seriously in certain industries where it could modify the products being produced (semi-conductors) or the analyses performed by the personnel (pharmaceutical weighing).

Sensitive areas should be given close attention, e.g.: structure / wall connectors, partition-wall / ceiling junctions and partition-wall / floor junctions, door closing systems and integration of equipment in the interior wall.

Special materials and equipment should be used for these connecting systems, e.g.: the use of vibration resistant seals.