from the subfloor, and thus reduce noise transmission. Common materials for acoustic flooring include Acoustiblok, rubber based crumb, cork and felt for example.

Soundproof Windows

Specialist types of soundproof windows use the principle of decoupling to reduce the sound that enters or leaves a room where installed.

These windows typically have thick glass panes and a layer of air trapped in between each layer.

Soundproof Doors

This is another type of architectural soundproofing solution.

Much like soundproof windows, soundproof doors are designed to use the principle of increased depth and mass as well as decoupling to reduce sound transmission.

Acoustic Panels

These panels are another type of sound absorption board, commonly referred to as AcoustiCloud Panels and AcoustiWall Absorber Panels and are installed invariably on the surface or near the surface of ceilings and walls.

Again these are used more so for controlling internal acoustics to equalise and calibrate.

They are reasonably effective when positioned correctly and cover sufficient volume and surface area as well as being aesthetically pleasing on the eye.

Acoustic panels are seen as a decorative alternative to acoustic foam and come in a range of colours, shapes and designs.

Acoustic Fabrics

Typically used for theatre curtains, blackout curtains and studio blankets, acoustic fabrics are a very thick type of fabric which are effective when it comes to dealing with acoustics in large rooms or halls.

They are also used as a wall lining to increase acoustic equalisation within rooms such as cinemas.

Acoustic Foam

Acoustic foam, also commonly known as Studio Foam, is wall mounted foam panels that can be flat, chamfered, convoluted, wedged or have pyramidal shapes protruding from them.

They mostly help to improve audio quality in studios and music rooms.

Acoustic foam works on the principle of sound absorption and re-calibration of internal acoustics, and so they are not as effective as other materials when it comes to blocking sound.

They should make a noticeable difference to internal acoustics and the audible values, but if you are looking for a sound blocking solution, there are far better materials you should consider.

It's important to note that the thickness and densities of these foams vary, which in conjunction with correct positioning, plays a significant part in their effectiveness and performance.

You should also take into account the type and amount of surface area to be covered.

End

problematic acoustic energy into a less problematic heat energy which is simply transferred through the material sideways to reduce flanking transmissions.

In any serious or advanced strategy to isolate sound, this is an absolute must to work in tandem with the other principles.

At only 3mm thick, the depth of the material is hardly noticeable in the grand scheme of things, but the benefits to uplift acoustic performance are immense.

The material has an optimum balance of mass and flexibility, however it does not rely only on its mass for acoustic performance, making it a unique and standalone sound proofing material.

Constrained Layer Damping

Constrained layer damping is a principle of using specific materials in particular ratios to reduce the natural resonant frequencies of the structure, thus reducing the resulting flanking transmissions through from one side of the structure to the other.

Damping compounds are effective when applied between two rigid panels, such as drywall or plasterboard for example.

As a result, when the sound hits it, shearing forces between the panels creates friction in the damping layer and the sound ceases as it is converted to heat, in essence thermal conversion occurs.This solution is ideal for low-frequency noises.

These essential principles of soundproofing outlined above work independently of each other, but can also complement one another. Often, combining different methods by using two, three, four or more of these principles offers the best results.

Types of Soundproofing Materials

There's an extensive list of soundproofing materials that QuietFibre is an example of a stone wool.They are designed to fit snugly between wall studs, ceilings and floors and uses the principle of sound absorption.

By doing so they will effectively pack out the airspace usually found in these areas, and so the transmission of sounds are impeded or considerably reduced by their presence.

Decoupling Products

Based on the principle of decoupling materials through which sound is transmitted.

Resilient Channels – there are varying types from simple you can choose from, for various applications.Each of these materials has different best use scenarios, and they work by means of one or more of the soundproofing principles outlined above.

Let's go over them in more detail to highlight key aspects of the material and how and when they are best used.

Acoustic Isolation Membrane

There are quite a few 'acoustic membranes' on the marketplace, with some being better than others.

The most advanced membrane in this category is the unique Acoustiblok Isolation Membrane which is the thinnest and highest performing material available, mm for mm.

It is considerably lighter and enables a higher thermal conversion of energy from an acoustic energy into a less problematic heat energy and transfer through itself.

This material which is available in 3mm and 6mm thicknesses, is commonly installed within walls, ceilings and floors to mitigate airborne and impact sound. Remarkably, it helps to block sound transfer more effectively than a sheet of lead and is ideal for sound insulation.

It is polymer-based and thus very flexible, adaptable and easy to install. It offers effective acoustic insulation without increasing the thickness of walls or ceiling, or loading with excessive weight for example.

Some other materials are known as Mass Loaded Vinyl (MLV) which are simply a rubber compound impregnated to increase mass and density.

These are much heavier materials and rely heavily on a deflective principle.

Open Cell Cavity Insulation

This material is typically installed into cavities, and tends to be made from rock wool,stone wool, mineral wool or fibreglass.

timber battens to aluminium metal rails that are specially designed to lay over soundproofing insulation once they are mounted across wall studs or ceiling joists.

Acoustic Hangers – which are isolation mounts which mechanically fix to the main structure and act as a gasket between the structure and the resilient channel / cross batten.

Acoustic Flooring

The principle of decoupling comes into play here. This material is used to decouple the main floor surface

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Deflection

Deflection of sound is achieved by adding mass and density to any structure such as a wall, floor or ceiling.

All solid materials which have a thick consistency and are dense or somewhat heavy, can help to block sound.

By adding mass and dense materials between the source of the sound and the receiving point will offer additional bulk that the sound wave will have to pass through and in doing so will reduce its energy.

Increased mass and density of a wall 's construction can be achieved with concrete for example, or dense finishing boards such as ply, OSB, drywall or plasterboard.

Deflection with mass and density proves more effective with airborne sounds such as voices or music, and not so effective with impact noise such as foot fall, which is usually associated with stronger power, pressure and therefore vibration.

As sound waves strike the mass and dense materials, vibration will occur and in doing so will pass the energy from one side to the other through the materials' own rigidity.

This is the principle of flanking transmission noise – a common problem with all structural scenarios.

Absorption

Open cell woven types of material such as QuietFibre Stone Wool Cavity Insulation, which provides a soaking up or absorption of the acoustic energy entering it.

These are available in differing thicknesses and densities for an increasing effect and are usually installed in open cavities where the depth of material can be tolerated.

Not only do these types of absorptive materials offer absorption, but it is also important to know that by filling a cavity they can also prevent the potential of additional resonance, reverberation or amplification of sound waves that could be created if the cavity were to be left completely empty.

Decoupling

The principle of decoupling is to reduce the area of direct mechanical linkage between the substrate or structure, say for example of a wall, and the finishing materials.

This process is a way of interrupting sound vibrations or flanking transmissions that travel through the structures' own connectivity or rigidity from one side to the other.

This may well be by a complete decoupling of an internal structure such as what is commonly called a 'room within a room' or a 'cell within a cell' or may simply be a decoupling by counter battening or resilient channels.

A good example is the use of acoustic brackets, acoustic hangers or resilient channels, which will help to decouple drywall from the rest of the building's structure.

As a result, the strength of the acoustic vibrations are reduced, thus slowing their potential passage through the wall. Decoupling is best done during the construction phase of a building.

Thermal Conversion

Acoustiblok Isolation Membrane is a material which works by converting sound energy into trace heat energy.

When sound waves come into contact with the membrane, it vibrates the molecules of the materials which in turn creates friction which is cleverly converted to a trace heat energy.

Thus the material works by converting a more