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Certified Doorsets : Delivering Assurance

# Acoustics in buildings

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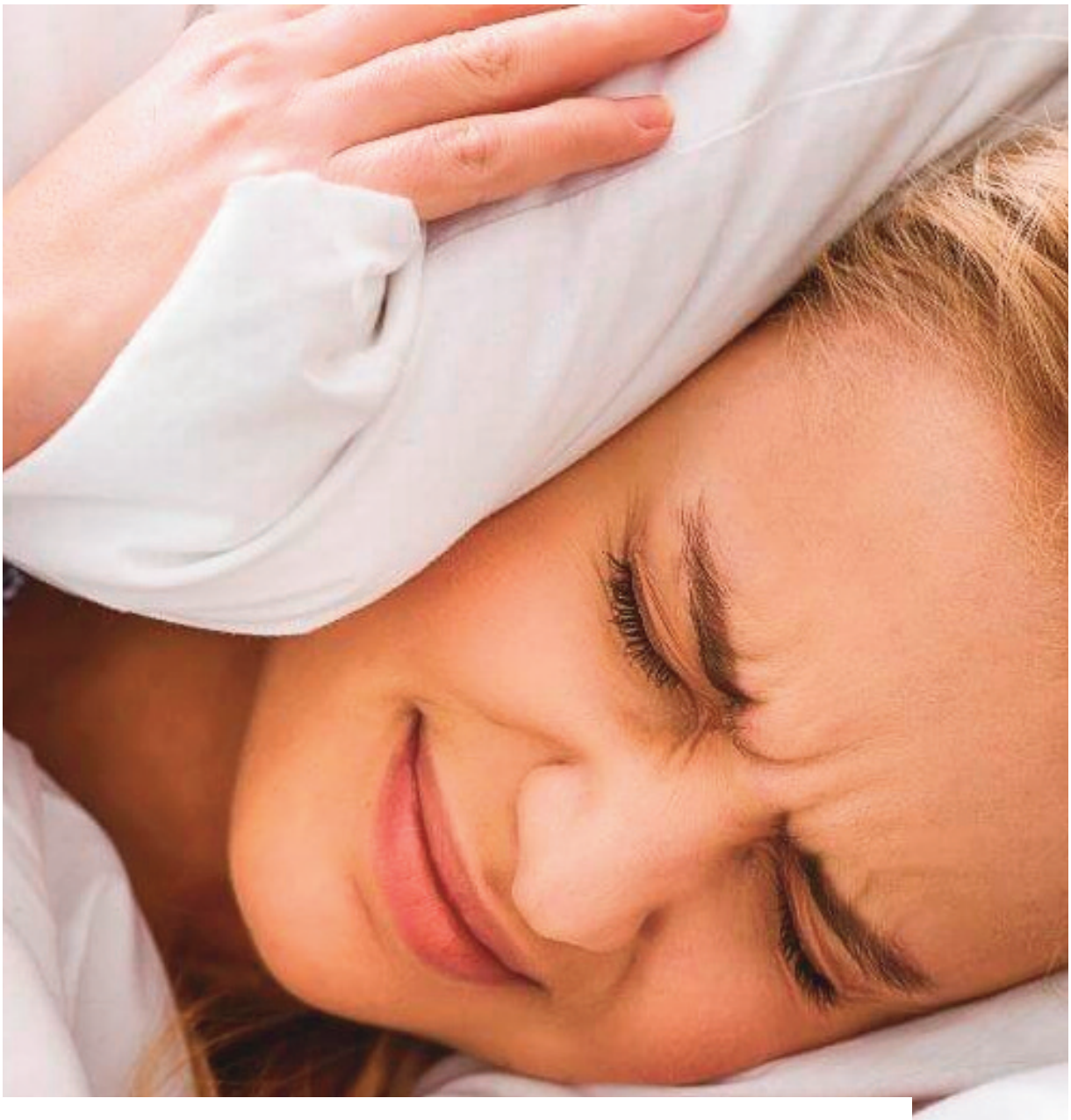

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## Sound science – keeping noise at bay

External or ambient noise can be much more than just a nuisance. In schools it can have a serious impact on teaching and learning. In residential buildings it can seriously affect people's wellbeing. It is a factor in as many as two-thirds of neighbour disputes.

This quick guide to the basics of sound attenuation explains how sound is measured, how it travels in buildings and how sound reduction is measured.

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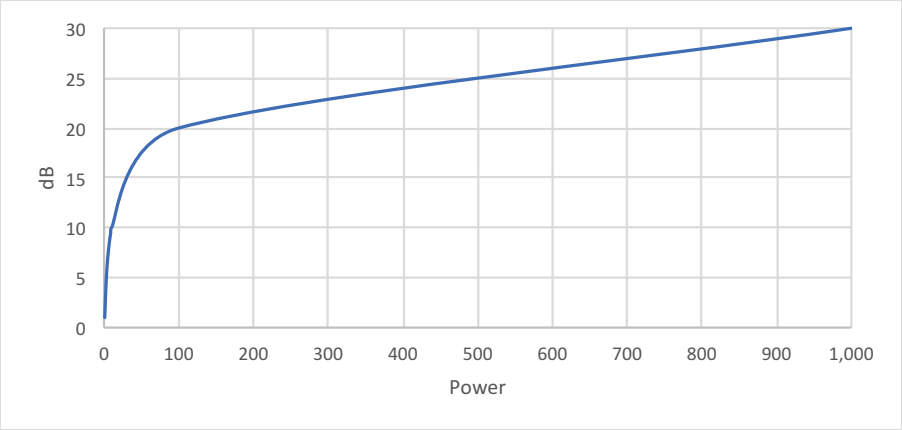
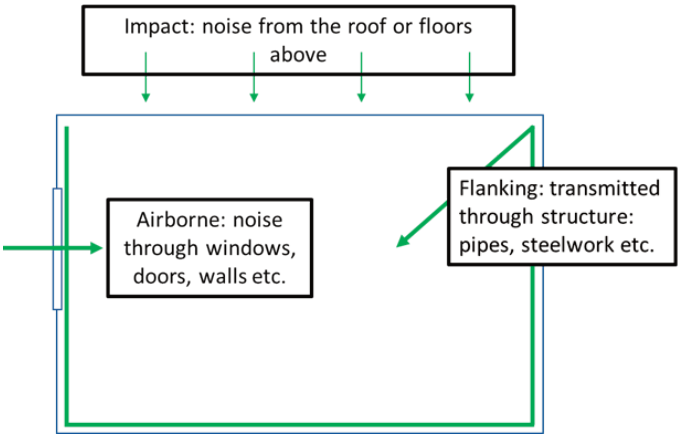
## Measuring sound

Sound is measured in decibels (dB). The more powerful the sound, the higher the dB. A logarithm is used to express the increase in power because as a sound becomes louder the power increases so much that the numbers become unmanageable – for example at 100dB the sound is 10,000,000,000 more powerful than at 1dB. By the time we get to jet engines (140dB), it's 100,000,000,000,000.

This makes sense when you think that there's a 30dB difference between normal conversation and a large lorry's idling engine but also only 30dB between that same engine and a large passenger jet taking off! The chart below shows what the relationship looks like up to 30dB.




## The importance of managing sound

Managing the transfer of sound is really important in buildings.

In schools it can really damage teacher-student interaction. In hotels it can have a serious impact on guest comfort and repeat business, and in residential buildings lack of sound insulation can be really damaging to people's wellbeing.

In construction, sound is described in three main ways: airborne, impact and flanking. The diagram shows how each of these works.

## Measuring sound reduction

For building elements, such as doors, what is measured is how much that element reduces the transfer of sound, often called sound attenuation. Two main measurements are used:

- Rw (weighted sound reduction index) – performance of a product or material, tested in a laboratory
- Dw (weighted level difference) – difference between where the noise is made and received, tested on site

Both are measured in dB and in essence it's a pretty simple test. Sound at a given dB level is made in one room and the dB level in the receiving room is measured. The difference in dB is the Rw or Dw figure. So a figure of 35dB or 35dB Rw means that if you make a sound at 60dB (the level of normal conversation) on one side of a door, it will be heard at 25dB on the other.

Manufacturers use Rw because they can only say what their own products will achieve. Due to the variability of conditions in a building it wouldn't be possible to give a meaningful Dw figure. So you might see a door advertised with 35dB or 35dB Rw next to it.

Dw is almost always lower than Rw because of the impact of environmental factors. So you can have a door rated at 50dB Rw but unless all other elements of the room and structure are equally highly rated the room is unlikely to achieve a 50dB Dw measurement.

**Contact us to find our how our PuraSound doors can help you keep noise at bay.**

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