TWISTI

Performance & Design on Woven Vinyl Flooring

HOW TWISTI CAN PLAY ON ACOUSTIC

ACOUSTIC - BRIEF INFORMATION

BY PANELSOUND®

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Grupo Mitera

INTRODUCTION

With this document we would like to give you an insight into the basics of acoustics. It is first of all important to realise that absolute silence is not the goal, but finding the right balance between sound and tranquillity is. A room with a long reverberation time is seen as a room with poor acoustics. The acoustics of a room depends on the absorption of the sound through, among other things, floors, walls and ceilings. Rooms with mainly hard surfaces (concrete, metal, etc.) can cause a lot of sound reflection, leading to disturbance.

SOUND LEVEL

> Decibel is a term used to indicate the sound level. When concentration is important, the desirable noise level in the room should be 40 dB, at a maximum. In all cases and requirements, the maximum noise level must remain below 80 dB for the 8-hour working day, in order to avoid hearing damage.

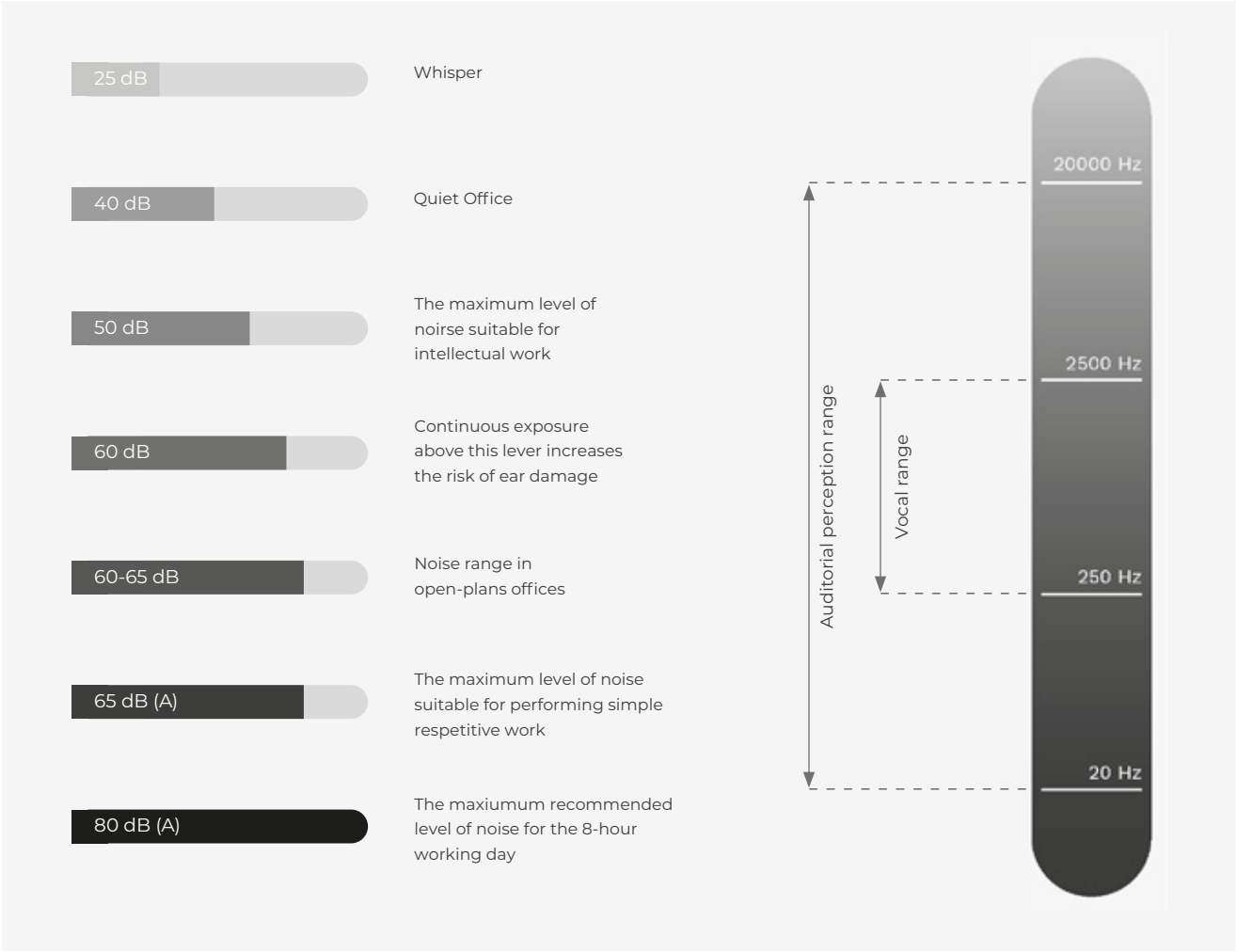
HUMAN RANGE

Acoustics is the science that deals with sound.
Sound, however, also has a human range. It is possible that the frequency is too high or too low for our perception. You can describe sound waves based on the number vibrations per second. This is called the frequency which is displayed in Hertz or abbreviated Hz. Human speech has the range of 250 to 2500 Hz. The human ear has a perception range of 20 to 20000 Hz. That is why acoustics does not just consist of the physical principles of sound but is also linked to the limited human perception.

ACOUSTIC STANDARDS

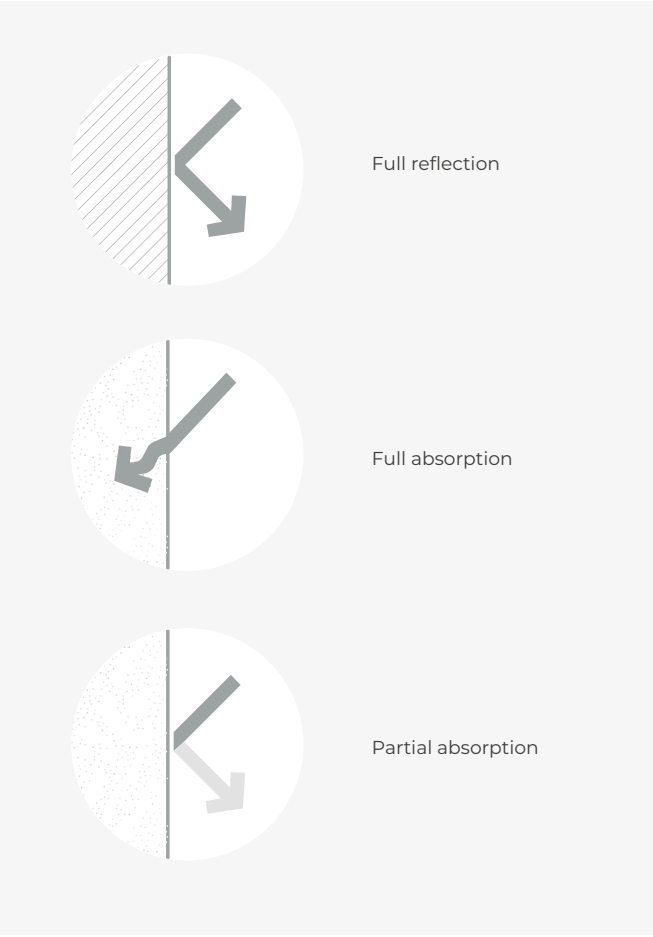
To prevent sound reverberation, sound must be absorbed. With absorption, sound is converted into heat by means of friction. The moving air particles make the absorption material vibrate and the sound loses its energy.

PanelSound® PET Felt panels have been tested by the Peutz Laboratory for Acoustics. The test conclusions are expressed in the sound absorption coefficient and the noise reduction coefficient.



Sound absorption coefficient	αw
Standard	ISO 11654
Frequenceies measured	250 - 4000Hz
Value scale	Entre 0 e 1

Noise redution coefficient	NRC
Standard	ASTM C423
Frequenceies measured	250 - 2000Hz
Value scale	Entre 0 e 1



SOUND ABSORPTION COEFFICIENT

The absorption coefficient is a value expressing how much energy is not reflected. This value ranges between 0 and 1, where 0% means no absorption and 1 stands for 100% absorption. The absorption coefficient is expressed in Alpha-w (αw) . An absorption value of 1 can be compared to an open window of one square meter. The sound that goes through an open exterior window gets fully absorbed and is therefore no longer heard. A panel with absorption coefficient of 0.5 means that a panel of two square meters effectively yields only one square meter of open window.

The absorption coefficient depends on, among other things, the frequency, therefore sound values are measured at different frequencies. The αw value is used to classify different sound absorbing materials.

NOISE REDUCTION COEFFICIENT

Noise Reduction Coefficient is expressed on a scale from 0 to 1. An NRC value of 0 corresponds to a complete reflection of sound. At the other end of the scale we speak of a complete absorption of the sound, in this case the NRC value is 1.

The NRC value is determined by measurements on the frequencies of 250 Hz, 500 Hz, 1000 Hz and 2000 Hz. The value calculated based on these measurements summarises performances across frequencies.

PANELSOUND® ACOUSTIC FELTS IN PRACTISE

Thanks to its sound-absorption properties, PanelSound® is extensively used as acoustic flooring, wall and ceiling solutions. The effectiveness of an acoustic product in different scenarios must be demonstrated in practice. Given the various factors, the right acoustic solution is always custom. However, basic knowledge is needed to define an acoustic problem.

4 STEPS TO IMPROVE OFFICE ACOUTICS

FLOOR, CEILING AND WALL COVERING

These are the main surfaces in the office, therefore, choosing sound-dampening covering for walls, ceiling and floor would do most of the work in improving workplace acoustics.

PURPOSE OF SPACE

Not every zone in the office is intended to silent. Thus, it is not required to take the same sound-dampening measures in conference rooms as in individual pods. Approach each of these areas individually by choosing relevant acoustic solutions.

MASKING CONVERSATION

Human speech is a numberone distraction in the office. Make sure that conversations mostly happen in the designated areas and think of the sound-covering solutions to mask human voice.

NOISE LOCALISATION

Separate the sources of noise from the zones where people need to concentrate. For instance, all loud office equipment like printers and coffee machines can be put in a separate space.

GLOSSARY

SOUND REFLECTION

Is the process by which the sound waves bounce off surfaces that they are unable to travel through. Perfect reflection results in zero loss of sound from material contact.

SOUND ABSORPTION

Is the process by which a material takes-in sound energy when sound waves are encountered. Part of the absorbed energy is transformed into heat and part is transmitted through the absorbing body.

DECIBEL

is the most commonly used measurement of sound level. 20 dBA is comparable to human whisper, while 120 dbA is equal to the jet aircraft taking off 100 m away.

NOISE REDUCTION COEFFICIENT

Is the standard rating for how well a material absorbs sound. Different materials have different NRC ratings that range from 0.00-1.00.

SOUND ABSORPTION COEFFICIENT

Is intended to measure the absorptive properties of materials. It has a value between 0 and 1. Zero represents no absorption (total reflection), and one represents total absorption of the incident sound.

ECHO

Occurs when two or more pulses of sound reach our ear with delays of 50ms or more. Then, our brain perceives such pulses as separate sounds, rather than one extended sound.

REVERBERATION

Is the persistence of sound after the sound source has been stopped. It results from a large number of reflected waves which can be perceived by the brain as a continuous sound.

REVERBERATION TIME

Is a primary metric in acoustics. It describes the time it takes for a sound to fade away in a closed space after a sound source is abruptly switched off.