

creating better environments

# What is a normal level of sound?

The human ear is capable of hearing a great deal of sounds, but over exposure to certain levels can cause damage. Nowadays, many of us are subjected to louder environments, such as underground rail, on a day-to-day basis. The following guide of relative decibel levels helps to provide some perspective:

0db 10db 20db 30db 40db 50db 60db 70db 80db 90db 10db 110db 120db 130db 140db Odb Joan MODERATE LOUD VERY LOUD **EXTREMELY LOUD** normal library ambulance

underground train **90 d B** classroom 60 d B average breathing 10 d B sounds 40 d B office 50 d B siren 70 d B 120 dB

When comparing sound levels, it is important to consider that the scale of measurement is not linear. For example, 60 dB is half as loud as 70 dB and is fairly quiet, whilst 80 dB is twice as loud as 70 dB. At around 80 dB, sound can start to become dangerous and affect hearing if experienced for a prolonged time. As such, there are increasingly stringent regulations regarding exposure to noise pollution.

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Webster's dictionary defines sound as:

## sound

" the sensation of hearing, that which is heard "

Oxford Languages dictionary defines noise as:

## noise

" a sound, especially one that is loud or unpleasant or that causes disturbance "

Unwanted Sound is noise pollution, and it can have adverse effects on the human body such as sleeping disorders, stress, headaches, memory loss, aggressiveness and learning difficulties. In fact, the fight against noise is a question of public health, as well as keeping our surroundings comfortable and quiet. That's why acoustic performance is essential when designing a new building or refurbishing an existing one.

If left uncontrolled, excess sound can become a real problem, particularly in housing, education, and healthcare facilities. As abovementioned, the effects of excess noise extend far beyond just hearing damage and can even manifest in mental and physical ailments.



It is essential that those designing and specifying buildings do all they can to pre-empt such issues and create harmonious, sound-controlled environments.

A materials impact on acoustics can be measured by how well it can lower background noise levels, serve as acoustical insulation, and reduce the transmission of impact sound, such as footsteps. Forbo Flooring offers solutions to help improve communication, block unwanted sounds, and lower overhead noise.

Table information source:

https://www.iacacoustics.com/blog-full/comparative-examples-of-noise-levels.html

# The different types of sound

Sound can take one of two forms: airborne noise, or impact noise. It is important to know the difference, as each comes with its own specific set of challenges. Products designed to reduce airborne noise will not necessarily reduce impact noise. Therefore, when designing new build homes, student accommodation or even healthcare and care home facilities, it is important to understand the difference. In doing so, those in charge of the process will be able to make well informed decisions about how to manage acoustics.

#### Impact noise

Impact noise occurs following a physical impact on a building, or solid material. For example, footfall and banging doors are both examples of impact sound. When impact sound occurs both sides of the building element vibrate, generating sound waves. As such, impact noises are often hardest to isolate. What's more, in rooms with dense materials, impact vibrations tend to be stronger and travel further. Acoustic flooring is a well-suited insulation solution for impact sound reduction.

#### Airborne noise

Airborne noise applies to things like TV noise, people talking and dogs barking. This form of noise travels through the air and will either reflect off building elements when it hits them or be absorbed into acoustic dense materials reducing the in-room impact noise. Sound can also travel through building structures and be radiated out to the other side. When reflected, the noise level can increase, and when absorbed can be reduced.



## What happens to Sound when it meets an Obstacle?



Sound is bounced off a surface. This usually occurs on flat, rigid surfaces with a lot of mass like concrete or brick walls. Because the sound wave can't penetrate very far into the surface, the wave is turned back on itself like a ricochet. The sound bouncing back off the surface creates an echo.



Sound Transmission Airborne transmission - a noise source in one room sends air pressure waves which induce vibration to one side of a wall or element of structure.



#### Sound is Absorbed

Acoustic absorption refers to the process by which a material, structure, or object takes in sound energy when sound waves are encountered, as opposed to reflecting the energy. Part of the absorbed energy is transformed into heat and part is transmitted through the absorbing body. The energy transformed into heat is said to have been 'lost'.

## How to control Noise



#### **REDUCE REFLECTED SOUND**

This usually occurs on flat, rigid surfaces with a lot of mass. Because the sound wave can't penetrate very far into the surface. The sound bouncing back off the surface creates an echo.

#### What are we trying to accomplish?

#### Forbo Flooring Sound Solutions

contribute to lowering noise disturbance within a building in a number of ways. The result is a more comfortable environment.



High-scoring IIC floor rating is crucial because it limits (blocks) the level of impact noises, such as footfalls, that reach lower levels, resulting in a more comfortable and tolerable lifestyle.

STC rating is the reduction in decibel level as noise travels from one room to another. Simply put, it measures how much sound (voice/music) a wall, door, floor blocks from reaching the other side.

#### NRC (noise reduction coefficient) & SAA (Sound Absorption Average)

measures the amount of noise absorbed by the material and not reflected. Rooms with higher NRC/ SAA rating helps improve the levels of background noise and echoes helphing clarify speech.

#### Ambient noise class

Walking on floors in buildings generates noise in the room where the walking takes place. Products receiving a Class A classification offer the best performance in terms of reducing in-room impact noise.



#### **ABSORB SOUND**

Acoustic absorption refers to the process by which a material, structure, or object takes in sound energy when sound waves are encountered, as opposed to reflecting the energy.

Airborne transmission - a noise

source in one room sends air

pressure waves which induce

vibration to one side of a wall

or element of structure



#### Take a step into a world of quiet...

Sound can have adverse effects on the human body such as sleeping disorders, stress and headaches. That's why acoustic performance is essential when designing a new building or refurbishing an existing one. Acoustic floors are key when it comes to reducing noise in buildings.

Forbo Flooring is a specialist in acoustic floors with more than 32 years of experience. In our acoustic range you will find linoleum and project vinyl floors with impact sound reductions up to 19dB.



#### MARMOLEUM CONCRETE

#3758 shale

#### What are the negative impacts of a noisy Healthcare environment on patients?

Medical studies show noise also causes problems during the day. As illness can increase sensitivity to environmental stressors, noise can create anxiety, driving up nursing calls as well as pain medication requests. In fact, side effects such as elevated blood pressure, quickened some researchers to conclude noise may even slow recovery rates and length hospital stays.





#3706 beton



## What are the negative impacts of a noisy classroom?

Noise disturbance has been recognized as a problem in schools, affecting the intelligibility of speech, and noise reduces the ability to hear lessons clearly and has a negative effect on a child's ability to learn. Studies examined by the World Health Organization (WHO) have found that children exposed to continuous disruptive noise can experience poorer reading ability,



#### MARMOLEUM COCOA

#3587 curcuma





#### Multi-unit housing

#### The cost of Noise

Noise pollution not only affects our health but also has economic implications. The costs associated with noise can include reduced productivity in the workplace, increased healthcare expenses, and diminished quality of life.

If you can hear someone talking while you're reading or writing, your productivity dips by up to 66% and noise in the a lower willingness to engage with others.

According to a 2018 survey, more than 70% of workers report feeling distracted on the job, all of this lost work is costing American businesses upward of \$650 billion per year.



**FLOTEX** REFRACT PLANKS

#137001 obsidian







#### ALLURA DECIBEL







\*IIC tested 6" Concrete with drop ceiling \*\* NRC when compared to other resilient flooring types \*\*\* Ambient Sound tested in accordance with NF-S 31-074 resilient flooring only



#### MARMOLEUM WALTON

#3378 stucco

#### Marmoleum Sheet with TopShield Pro

Naturally beautiful, durable, sustainable and healthy! Forbo Marmoleum floors are associated with sustainability, durability, high quality, and innovative design. Our Marmoleum range includes solutions for virtually any type of application. Discover the natural beauty of Marmoleum flooring with over 300 colors and designs, ranging from marbled to linear and concrete. Marmoleum sheet can offer impact sound reduction of 5 dB. Marmoleum sheet Class B classification reducing in-room impact noise.



#### Marmoleum Decibel

Marmoleum Decibel, a sustainable acoustic flooring, achieves higher impact sound reduction values thanks to a special insulating layer, which is laminated to the linoleum sheet. In turn, this sheet can offer impact sound reduction of 18 dB. Marmoleum Decibel's Class A classification offer the best performance in terms of reducing in-room impact noise.



MARMOLEUM DECIBEL

#370835 fossil



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#### **ALLURA DECIBEL**

#9718 sage green ash



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#### Allura Decibel

Allura Decibel luxury acoustic vinyl tiles are made with passion for innovation, design and the environment. The balanced palette of 30 Wood and Material designs combines beautiful floor design with high performance and excellent impact sound reduction values 19 dB and offering an industry leading Class A classification in terms of reducing in-room impact noise. The D3S core technology makes C3A166 the best dimensional stable flooring possible for this type of floor covering.





IIC*	- <u>A</u> -	50 IIC	
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NRC**	allinallae	VCT	
ambient noise ***	<b>~</b>	CLASS A	

\*IIC tested 6"Concrete with no drop ceiling \*\* NRC when compared to other resilient flooring types \*\*\* Ambient Sound tested in accordance with NF-S 31-074 resilient flooring only

### Forbo NR99 Underlay System

#### recommended for use with:

- Marmoleum Modular
- Marmoleum Modular Striato
- Marmoleum Composition Tile (MCT)

Create your floor! Our Marmoleum Modular collection presents sustainable linoleum tiles in various sizes & designs that allows you to create stunning floor designs. The planks and tiles are created around visuals of wood, concrete, stone, and marble and can be used to mix and match or on their own, both delivering a beautiful sustainable floor.

- Forbo NR99 Underlay System Marmoleum Modular can offer impact sound reduction of 5 dB.
- Forbo NR99 Underlay System & Marmoleum Modular offering an industry leading Class A classification in terms of reducing in-room impact noise.
- Requires a 2-step installation



#### MARMOLEUM COCOA

#3590 meringue





MARMOLEUM CINCH LOC SEAL #935251 black glacier

#### Marmoleum Cinch LOC SEAL with vapor/sound barrier

The new Marmoleum Cinch Loc Seal collection with waterproof core, provides a beautiful, healthy, easy-to-clean floor that is kid-proof, pet-proof, and waterproof! Available in a variety of colors and 2 versatile formats (12"x12" squares and 12"x36" planks) Marmoleum Cinch Loc Seal easily mixes and matches, allowing your imagination to soar with design possibilities. Acoustical impact sound reduction 17 dB and 21 dB (installed on Forbo foam) Offering an industry leading Class A classification in terms of reducing in-room impact noise.

IIC\*

STC





ETERNAL DE LUXE **DECIBEL** 

#3018 whitewashed oak

#### Eternal de Luxe Decibel

Renowned for its wide variety of designs and outstanding performance across a range of demanding applications, our Eternal de Luxe Decibel flooring is an excellent example of Forbo's uniquely premium design capabilities in a \*17 dB acoustic format. The collection, which features stone and fresh wood effects, is enhanced by authentic embossing structures to add even greater realism to the designs. PUR lacquering maximizes the durability and performance of the floor covering. Offering an industry leading Class A classification in terms of reducing in-room impact noise.





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### FLOTEX VISION

#270003 dahlia bouquet XS terra

#### Flotex

Our flocked flooring option, Flotex is a unique textile floor covering, which combines the hard-wearing characteristics of a resilient floor with the quality, warmth and comfort of a carpet is perfect for a variety of commercial and domestic applications. Flotex provides excellent impact sound reduction of between 19 and 22dB.









#### **Flotex Modular**

Sophistication & style in modularity. As modularity is a major trend in flooring, Forbo has developed a unique range of Flotex Modular 9.48" x 39.37" (100 cm x 25 cm) and 20" x 20" (50x50 cm) tile formats with which stunning floorplans can be created. We offer exciting floor designs that offer endless possibilities to mix and match, perfectly adapted for all sorts of environments.

Flotex Modular provides excellent impact sound reduction of 22 dB.



FLOTEX WOOD PLANKS

#151006 antique wood





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#### **Flotex Sheet**

Flotex sheet floor covering offers an ideal textile flooring option for almost every public and commercial area. With multiple Flotex brands available in sheet format, there is always a design that fits your needs. Flotex Modular provides excellent impact sound reduction of between 19 dB.





FLOTEX VISION SHEET custom made color





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