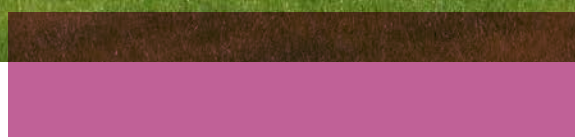
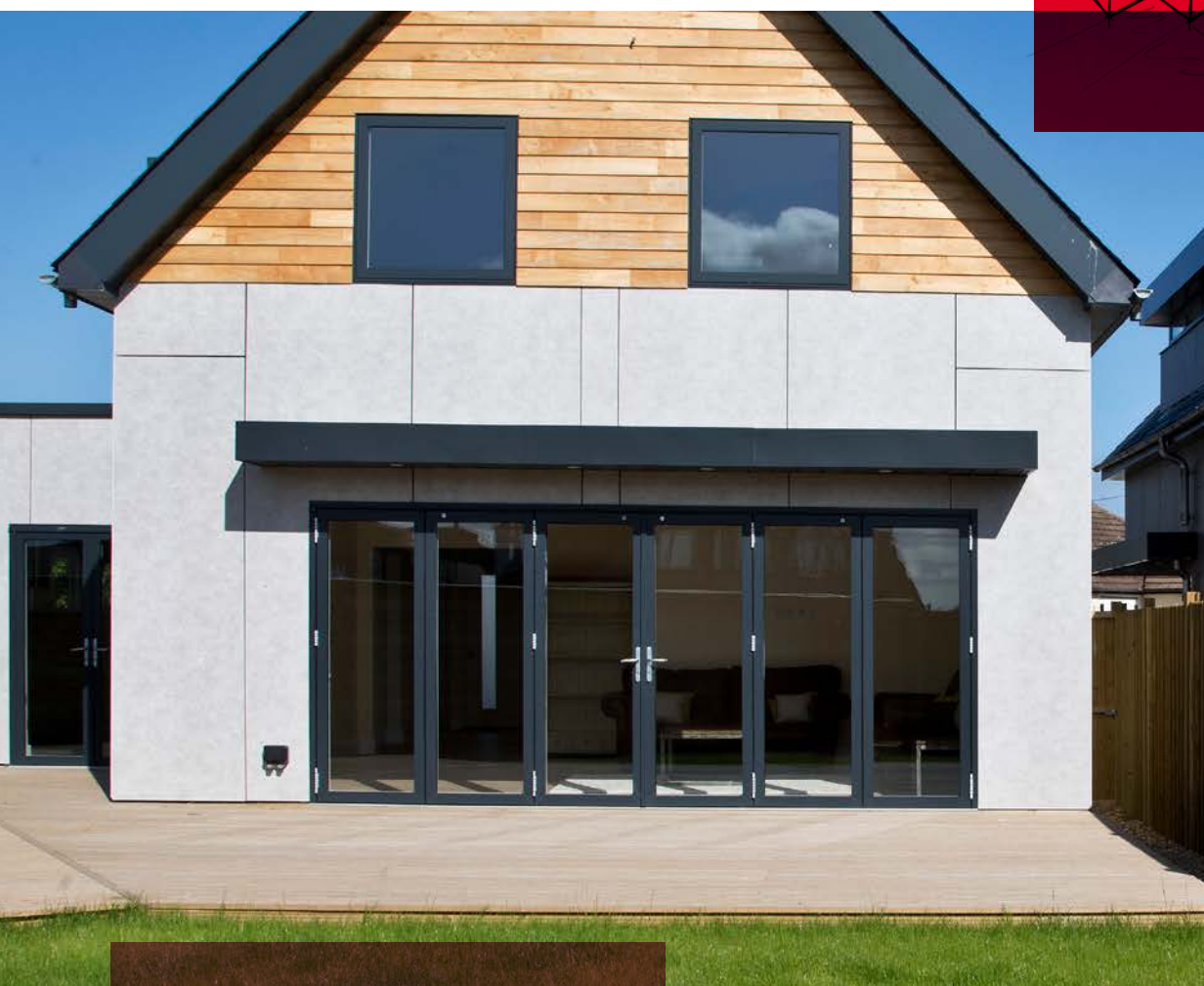


# The Comfort Zone

7 steps to soundproof your home



# Introduction

The home is the comfort zone for every family – the place where you can rest, relax and recuperate. Maintaining a comfortable environment inside the home is not just good for the occupants' wellbeing, it is necessary for their long-term health. An area that is often overlooked is noise and its impact in a domestic context. As the world gets progressively louder, many homes are not capable of dealing with excessive noise.

This guide will show you how noise affects people's behaviour at home, its influence on health, and the steps you can take to improve the acoustic environment and create a more comfortable living space. Each year, more and more people move to cities, increasing the ambient noise levels as the urban areas grow. This means that families need to take action and soundproof their homes to improve their quality of life.





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# What is noise, and how does it impact people?

People are always listening. A loud sound can rouse someone from a deep sleep and distract another in the middle of a conversation. A mother's voice lulls a baby to sleep, and classical music can let a teenager concentrate on complex maths. Sound has an intricate relationship with the human psyche. The health sciences now have a much better understanding of what noise is and how it influences our wellbeing.

## **The difference between sound and noise**

All noise is sound, but not all sound is noise. How a person distinguishes between a sound and a noise depends on what they are trying to listen to at that moment. The human brain can tune in and out of specific sounds, and any sound that disrupts this process is noise. [Noise pollution](#) is simply unwanted sound that reaches a level where it causes unintended effects in the people exposed.

## **How sound travels and how to measure it**

Sound travels as an airwave through the environment. Its intensity depends on the wave's frequency and volume, expressed as decibels (dB). The higher the sound reaches on the dB scale, the closer it gets to being considered a noise.

Noise can travel through any gaps in walls and windows, including the pores of walls. Reverberation increases noise as the walls, ceilings, and floors reflect some of the sound. Without adequate insulation in place, noise will escape from a space and pollute the surrounding area. This is the leading cause of noisy neighbour complaints in apartment buildings.

# Health impacts of unwanted noise

Multiple studies have shown the negative effects noise can have on human populations. Occupational safety regulations set safe dB limits in workplaces to prevent permanent hearing-related illnesses like tinnitus. While recommendations exist for residential noise levels, legislation that enforces these levels are rare. The [World Health Organization](#) (WHO) also lists increased risks of heart disease, reduced focus in children, higher annoyance levels, and illnesses from stress due to elevated noise levels.

## Positive effects of reducing noise pollution

WHO recommends that the ambient noise level should not exceed 40 dB for adequate rest and recuperation during sleep. Exposure above this level for a year can lead to sleep disturbance and insomnia. Over the same time period, if the night-time noise level is above 55 dB – the sound of a busy street – it can cause elevated [blood pressure that can eventually lead to a heart attack](#). Soundproofing a residence to reduce noise levels to below the recommended levels will improve the health and wellbeing of the occupants.

## Leveraging the natural robustness of stone, stone wool withstands



Sleep deprivation



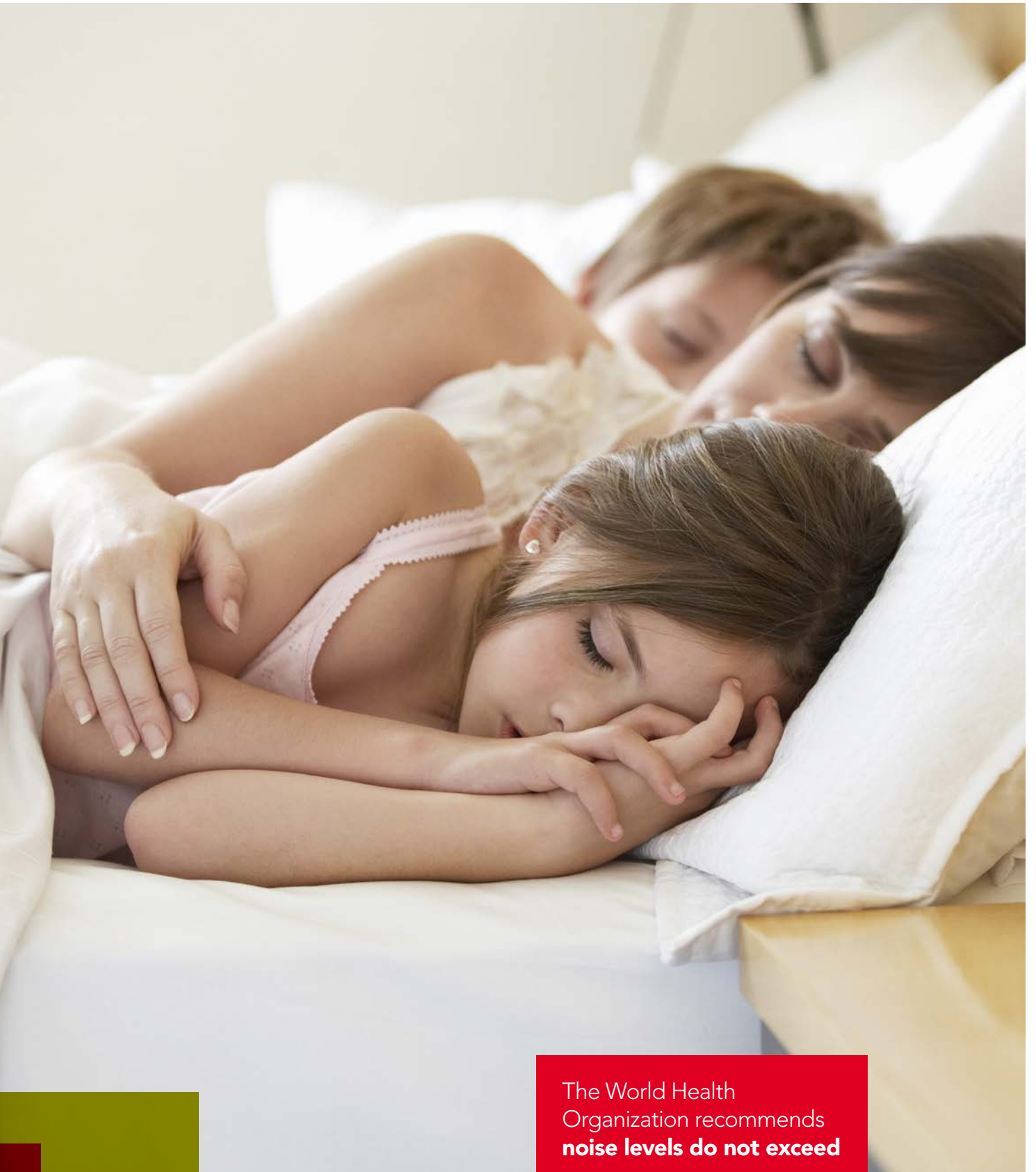
Stress



Diabetes



Heart disease



The World Health  
Organization recommends  
**noise levels do not exceed**

**40dB**

**during sleep**





# How noise affects people differently

Adults and children experience noise differently. The human ear is a complex organ that can distinguish millions of different sensations while processing audio signals. Children are capable of tuning into higher frequencies that most adults can no longer perceive. This makes it extremely important to optimise your child's learning environments – both at school and at home – to help acquire and retain new information.

## **The effects of noise on human development**

Noise pollution in a young child's environment can reduce their ability to acquire speech and language. It can also lead to similar health effects during adulthood like hypertension and cardiovascular ailments. Schools and academic institutions are improving their learning environments using acoustic design practices.

Insulating walls and ceilings with soundproof materials can improve immediate acoustics without disturbing nearby classrooms. Schools are also adding more distance between social areas and academic spaces. For adolescents growing up in urban environments, the library is probably the quietest place they ever visit.

# How to improve the acoustics in a home

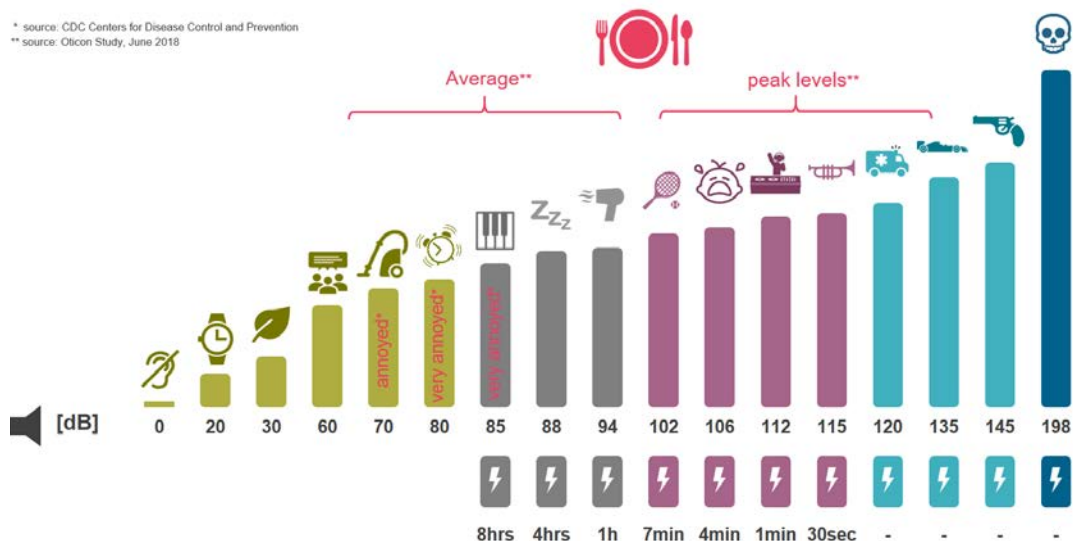
Improving the acoustic environment in homes starts with planning. If the home is in a quiet neighbourhood, some simple solutions can help. If the residence is located close to sources of noise like busy streets, trains, or airports, more effort will be required. Most homes require some degree of soundproofing to ensure optimal acoustic comfort.

## What is soundproofing?

Soundproofing involves reducing noise by using a passive barrier. The idea is that this barrier will dampen or even absorb the noise instead of reflecting it. Although most soft materials have a dampening effect on noise, some materials are better than others. Stone wool has excellent acoustic capabilities, absorbing sound and dispersing it as harmless friction via its pores. Using simple furnishing like plants and rugs might help, but completely soundproofing a home will need some amendments to the structure of the building. This could be, for example, improving the insulation materials to help manage the indoor acoustics of a house or apartment building.

## Securing optimal acoustic comfort

Buildings should use modern insulation materials, such as stone wool, below floors, in walls, on exterior facades, and within ceilings. In addition to making for a more comfortable living space, improving the acoustical environment could also increase the value of the home or apartment.





# 7 Steps to soundproofing a home or residence

Reducing noise pollution in the home should start with understanding the extent of the problem. Different times of day may have varying levels of noise. Start by taking measurements using a reputable dB meter or app that can help identify where the gaps in the barriers exist. After you establish the levels and identify the potential sources, these steps can help you reduce the levels of noise pollution the residence experiences.



## 1. Soundproof floors and ceilings with stone wool

Controlling the noise that travels from the floor above to the room below – or vice versa – can be very difficult. If the sounds of clicking heels or heavy foot falls are pounding the ceiling, you could consider installing sound absorbing insulation. Reversely, if you are tired of your downstairs neighbour complaining every time you move a chair, it might be worth adding insulation beneath the floor. ROCKWOOL offers wide-range of sustainable and effective solutions for both floors and ceiling.

## 2. Insulate walls with stone wool

Insulating interior and exterior walls with stone wool materials will drastically reduce noise pollution. Whether you want to block out the sound of your neighbour's television, a busy road or the washing machine, stone wool's natural sound absorbing capabilities will help you achieve the quiet comfort you are looking for. [ROCKWOOL insulation](#) can work in many different applications, including walls, ceilings and basements for additional soundproofing. It also has the added benefits of reducing energy costs and improving fire safety.





### 3. Install Rockfon ceiling tiles and acoustic panels

A great way to harness the acoustic capabilities of stone wool in your home – without having to break open your walls or floors – is to use Rockfon ceiling tiles and acoustic panels. Just like ROCKWOOL insulation, Rockfon products are made from stone wool and have the same sound absorbing capabilities. The products are designed specifically for use in noisy environments and are aesthetically pleasing to fit in with every stylish interior.

### 4. Soundproof or upgrade windows

Similar to other insulation products, the thickness of windows will determine its soundproofing capabilities. If the home has single plane glass, double-glazing windows or laminate, it will increase its ability to block noise. For the best results, special soundproof windows can block up to 95 percent of sound from entering the home.



### 5. Plug gaps in windows and doors

Anywhere air moves, sound will follow. If there are gaps in the window and doorframes, these will allow noise to enter or exit the space. Plugging gaps with a sealant will reduce air flowing from inside to outside, reducing the effects of noise.

# 7 Steps to soundproofing a home or residence



## 6. Choose sound-absorbing furnishings

Thick carpets and curtains can help reduce noise pollution. Rugs and soft chairs or couches will also improve the acoustic environment in rooms. Additionally, the placement of large furniture influences how sound travels through a room, so strategic rearrangement could reduce noise pollution.

## 7. Use natural barriers like plants

Some indoor plants make excellent sound absorbers, reflectors, and refractors. The flexible and porous fibres in these plants make them excellent natural barriers to sound and reverberation. Depending on their placement and quantity, plants can [help reduce the sound energy](#) in a room by as much as 50 percent.





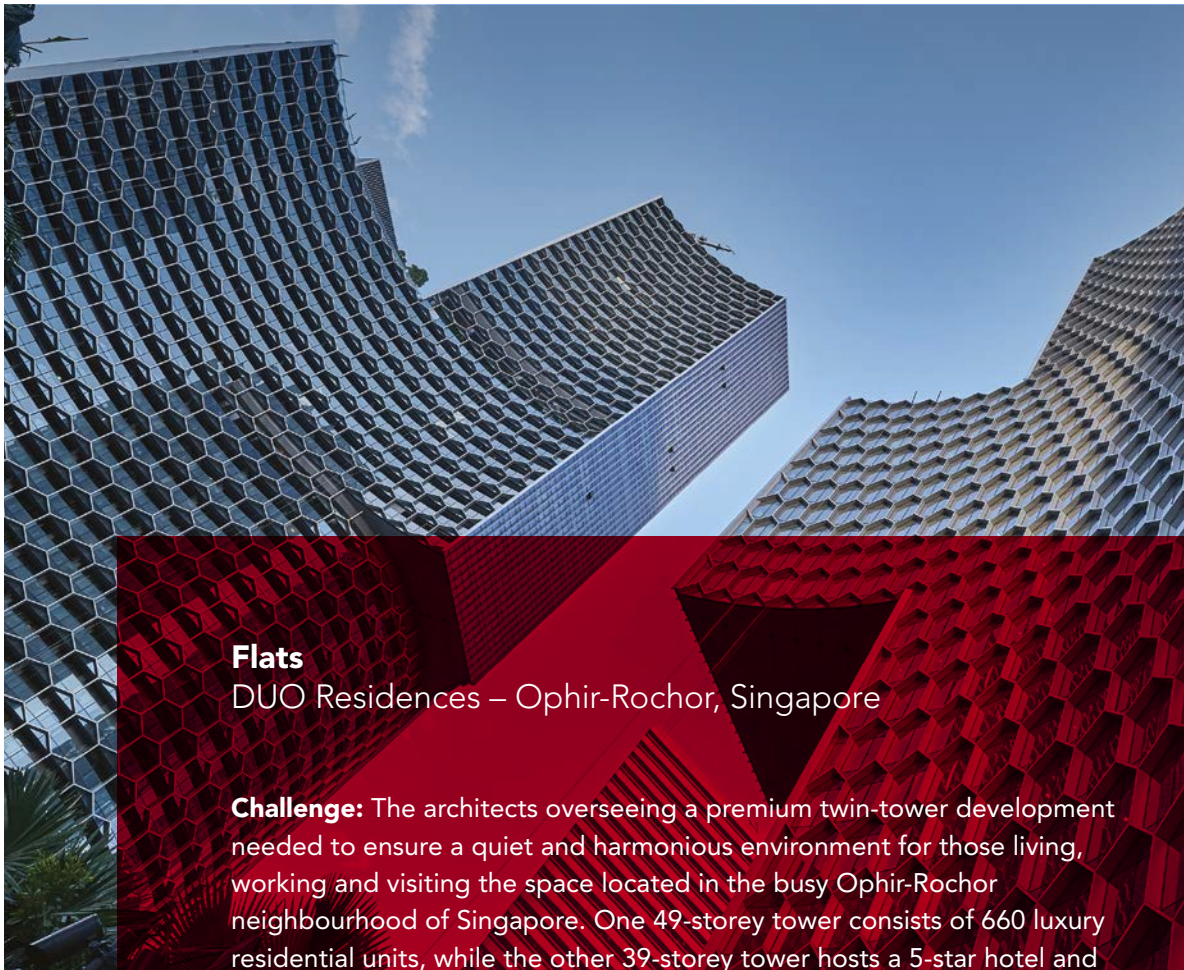
## Conclusion

Noise pollution is an emerging health crisis for people living in urban centres, where people spend almost 90 percent of their time indoors. When refurbishing existing homes or apartments, it is essential that owners optimise these environments for improved health, wellbeing and comfort. Similarly, for any new construction projects, keeping the internal acoustics of the design in mind during every step is vital to prevent unintended noise pollution from reverberating through the structure.

By soundproofing homes and apartments with stone wool products that naturally absorb sound, families can live peacefully while the world outside continues to bustle non-stop. This will improve concentration, reduce sleep disturbance and prevent the long-term adverse health effects of noise pollution. It can also help increase the property value, making it a worthwhile investment.

[Learn more about our solutions](#)

# Case studies



## Flats

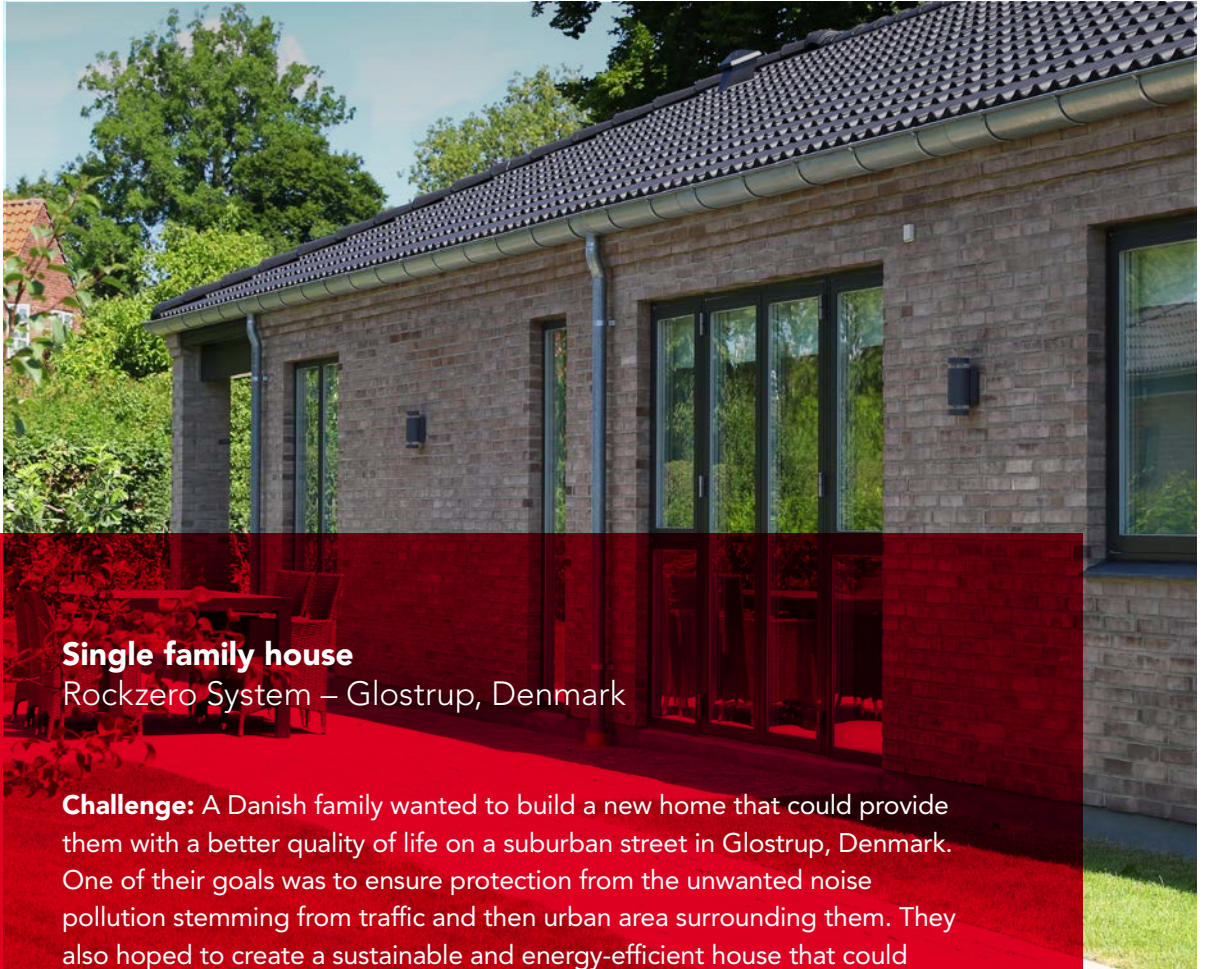
DUO Residences – Ophir-Rochor, Singapore

**Challenge:** The architects overseeing a premium twin-tower development needed to ensure a quiet and harmonious environment for those living, working and visiting the space located in the busy Ophir-Rochor neighbourhood of Singapore. One 49-storey tower consists of 660 luxury residential units, while the other 39-storey tower hosts a 5-star hotel and multiple levels of premium office and retail space. They wanted to reduce noise pollution and improve acoustics, particularly for homeowners in the luxury units ranging from studios to penthouses.

**Solution:** ROCKWOOL insulation was chosen for all partitions and ceilings, due to its use of stone wool which boasts excellent sound-absorbing qualities. The materials also offered the added benefits of increased safety, thermal performance, comfort and long-term sustainability. In an area famed for vibrant retail and entertainment options, the DUO Residences now stand out as a quiet and prestigious place to live and work.

[Read the full case study](#)





**Single family house**  
Rockzero System – Glostrup, Denmark

**Challenge:** A Danish family wanted to build a new home that could provide them with a better quality of life on a suburban street in Glostrup, Denmark. One of their goals was to ensure protection from the unwanted noise pollution stemming from traffic and then urban area surrounding them. They also hoped to create a sustainable and energy-efficient house that could meet future energy requirements.

**Solution:** The building company advising the family suggested future-proofing their house with the innovative building system, Rockzero, developed by ROCKWOOL. Targeting families who want to live sustainably while achieving a low heating bill and a high level of comfort, the Rockzero system is based on stone wool that is a natural and efficient sound absorber. With Rockzero, they created a safe and sustainable dream house where the family could thrive in the comfortable indoor environment.

[Read the full case study](#)



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