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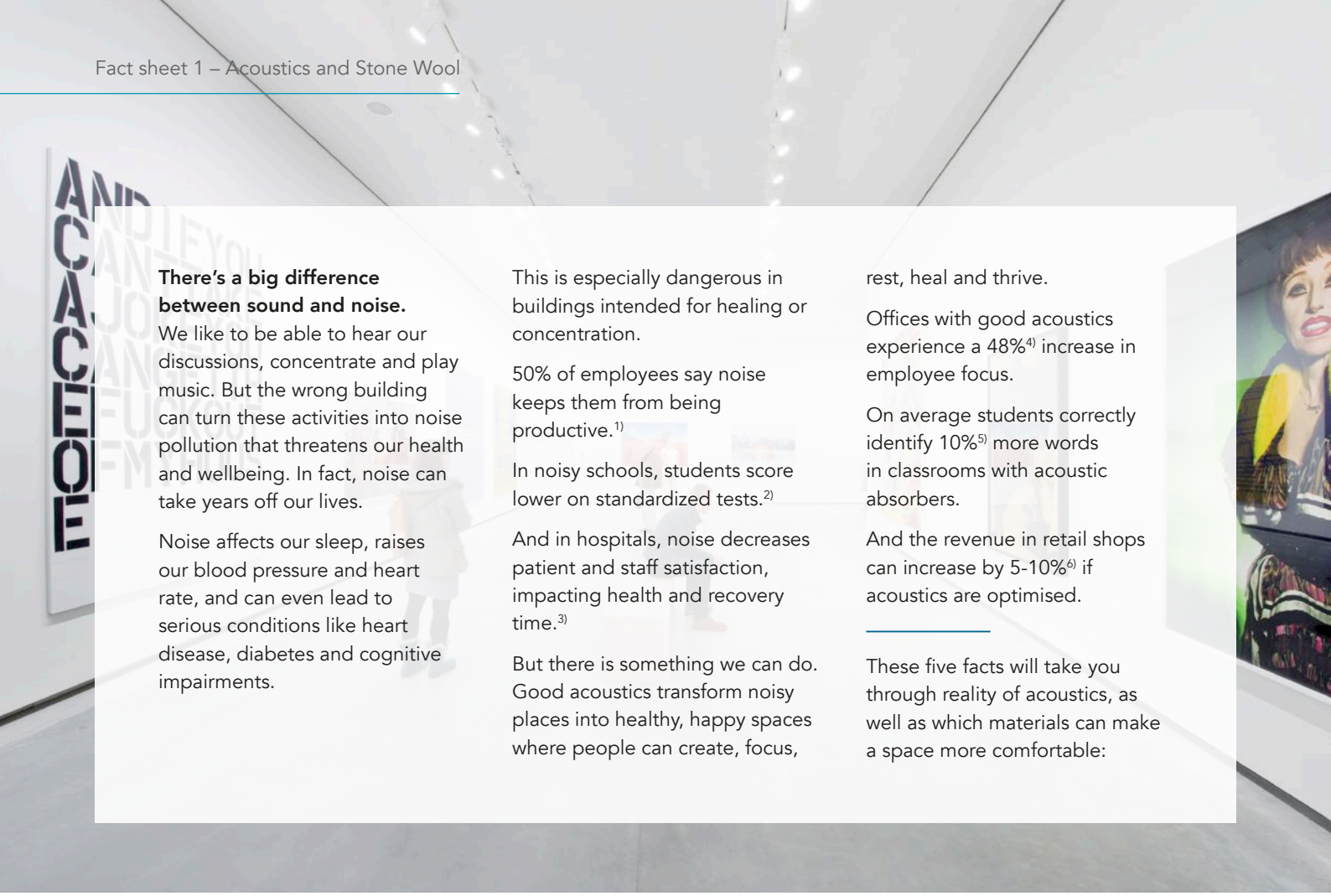
Aha!

5 FACTS ABOUT | **Acoustics** and stone wool ceiling tiles

Sounds Beautiful



There's a big difference between sound and noise. We like to be able to hear our discussions, concentrate and play music. But the wrong building can turn these activities into noise pollution that threatens our health and wellbeing. In fact, noise can take years off our lives.

Noise affects our sleep, raises our blood pressure and heart rate, and can even lead to serious conditions like heart disease, diabetes and cognitive impairments.

This is especially dangerous in buildings intended for healing or concentration.

50% of employees say noise keeps them from being productive.[1)]

In noisy schools, students score lower on standardized tests.[2)]

And in hospitals, noise decreases patient and staff satisfaction, impacting health and recovery time.[3)]

But there is something we can do. Good acoustics transform noisy places into healthy, happy spaces where people can create, focus, rest, heal and thrive.

Offices with good acoustics experience a 48%[4)] increase in employee focus.

On average students correctly identify 10%[5)] more words in classrooms with acoustic absorbers.

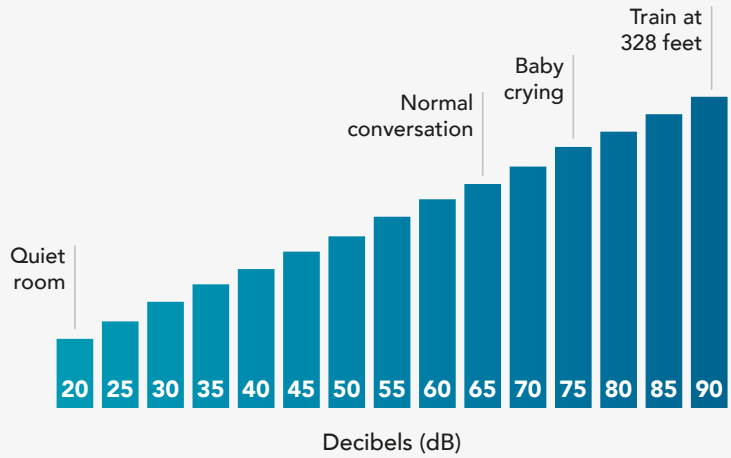
And the revenue in retail shops can increase by 5-10%[6)] if acoustics are optimised.

These five facts will take you through reality of acoustics, as well as which materials can make a space more comfortable:

01 What is sound and how is it measured?

Sound is a small, rapid fluctuation in air pressure above and below atmospheric pressure. The human ear is extremely sensitive to these fluctuations and can hear a large range, from very quiet to painfully loud.

The way we perceive sound is a little more complicated. It's not linear, for starters, so it is measured on a logarithmic scale. In other words, a sound measured at 60 decibels feels twice as loud as 50 decibels. Check the diagram below to see the typical volume of common sounds.



Sound Absorption is the ability of a material to absorb rather than reflect sound waves, by converting the energy of moving air molecules into heat through friction inside the pores of the material. Stone wool has a multi-directional complex fibre structure that results in high-performing sound absorption.

1. GSA Public Buildings Service, Sound Matters: How to achieve acoustic comfort in the contemporary office.
2. Antioxidants & Redox Signaling, The Adverse Effects of Environmental Noise Exposure on Oxidative Stress and Cardiovascular Disease.
3. The Construction Specifier, The New Era of Healthcare Acoustics
4. Sykes, David M., PhD., 2004, "Productivity: How Acoustics Affect Workers' Performance in Open Areas"
5. https://www.acousticalsurfaces.com/soundproofing_tips/html/crashcourse.htm
6. Treasure, Julian, 2009. TEDGlobal 2009

02 Looking for comfort? Consider your acoustics.

When designing a comfortable environment, we often think about cushions and chairs. But the invisible world of acoustics has a staggering impact on our comfort, as well as our overall productivity and wellbeing. The first thing we need to do is ensure that the building is insulated from external noise, by having well insulated external walls and windows. After achieving that we can focus on improving indoor acoustics.

- **In hospitals:** Noise can increase heart rate, blood pressure and respiration rate, making noise control crucial to patient recovery times.
- **In classrooms:** Speech intelligibility can be as low as 75%, meaning that on average students cannot hear every fourth word from their teacher's mouth.[4)]
- **At work:** Better acoustics can improve productivity by 75%, boost motivation by 57%, and help up to 49% of employees feel happier at work.[5)]

03 Choose sound absorbing materials for your building

When it comes to building construction, every single element affects acoustics. Acoustics are not just a consideration for walls and ceilings – every shape, surface, material, light fixture, mechanical system and piece of furniture will impact the sound of the space. Failing to consider this usually results in a poor acoustic environment.

For example, choosing a material that can reflect sound waves is likely to create a noisy interior. Choosing a sound-absorbing material, however, can reduce ambient sound levels and help prevent noise travelling from one space to another.

4.Classroom Acoustics 1, 2000 https://acousticalsociety.org/wp-content/uploads/2018/02/classroom_acoutics_1.pdf
5.Statistics from the Udemy 2018 Workplace Distraction Report

04 Stone wool contributes to good room acoustics.

Room acoustics (or the way sound behaves in a room) come down to two key aspects:

- **Sound absorption:** Is the ability of a material to absorb rather than reflect sound. To understand the difference, imagine throwing a rubber ball against a wall versus throwing it into a pile of pillows.
- **Reverberation time:** Is the measure of how long it takes for a sound to 'die out' after the source of the sound has stopped.

The acoustic properties of the building materials you specify have a significant role in overall indoor acoustics. Stone wool is a fibrous material that functions as a high performing sound absorber and contributes to improved room acoustics by absorbing and damping sound waves.

Our stone wool acoustic solutions offer high sound absorption and thus low reverberation times, which align with local and national acoustic requirements. They also meet or exceed all environmental and sustainability standards, such as the LEED® Green Rating System and the WELL™ Building Standard.

05 Want beautiful design? Try acoustic panels and ceilings.

These days, acoustic treatments can be featured as beautiful design or cleverly hidden so nobody will even notice. That's why we offer our high-performing, sound-absorptive products in a range of exciting formats and options.

Modular Ceilings: These ceiling panels are suspended using a metal grid to form a natural, flawless ceiling that can complement any design. Panels are available in various sizes, colours and edges that either show off or conceal the ceiling grid.

Open Plan: When you prefer a lofty overhead space, stone wool islands and baffles make the perfect solution. These can be suspended horizontally or vertically in eye-catching patterns.

Challenging Spaces: Working with a challenging, historic or modern space? Stone wool panels can be mounted directly to any concrete, plaster or a gypsum board surface, so you can deliver acoustic comfort without compromising the design aesthetic.

Inspired to learn more about acoustics and stone wool? Explore the product benefits section on our webpage.

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