

ECOPHON EDUCATION GUIDE

MAKING WHAT'S IMPORTANT HEARD

*Get sound-smart
by design*

5 TIPS
FOR A BETTER
SOUND ENVIRONMENT
IN SCHOOLS

**LOW
FREQUENCIES**

Free the
full potential
of education

Ecophon
SAINT-GOBAIN

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Making w imp

04



What's important

HEARD

Ecophon believes in education – its importance, relevance and power to literally transform the world for the better. We strongly believe that preventing disruptive, and unnecessary, noise in learning environments is fundamental to that idea.

Educational environments are where we learn to discover what is best about ourselves. They are where life paths are chosen, values and personalities are formed, ideas and ambitions are nurtured and friendships are forged. In these spaces, how and what we hear will have lasting effects on our lives, and by extension, the world around us.

No ambition should be compromised by a misunderstood sentence. No potential need be held back by background noise. In education, what's important to any of us should be important to all of us. Make sure it's heard with Ecophon.



Free the potenti

06



Sound
is wanted.

Noise
is unwanted.

full of

OF EDUCATION

Imagine we could increase student test scores, improve their collaboration skills and confidence to speak up, or speed up their ability to perform complex tasks. By optimising acoustics in the learning environment, we have proven the above to be possible.

Less chaotic sound spaces make it easier to understand speech. They improve understanding, concentration and ability to focus, speed up problem-solving and minimise stress. All of which can lead to a rewarding learning environment with more motivated teachers and students. But the potential downstream benefits, in terms of each student's ability to realise their ambitions, could be enormous. To them, and to us all.

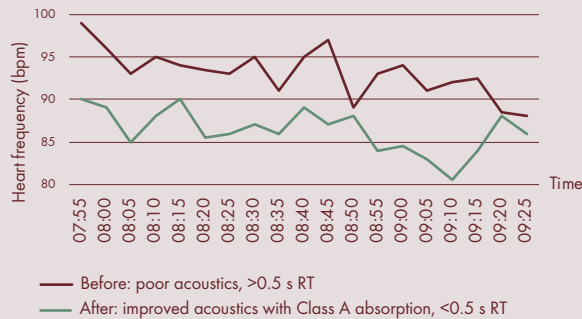
REDUCING REVERBERATION TIME

in a room, leads to significantly less perceived noise in students and less annoyance caused by noise. Children perceive their teachers more favourably when reverberation time is lower.¹

64 DB BACKGROUND NOISE, AN AVERAGE THAT IS COMMON TO MOST CLASSROOMS²

CLASS A ACOUSTIC TREATMENT CAN REDUCE TEACHER HEART-RATES BY UP TO 10 BEATS PER MINUTE.³

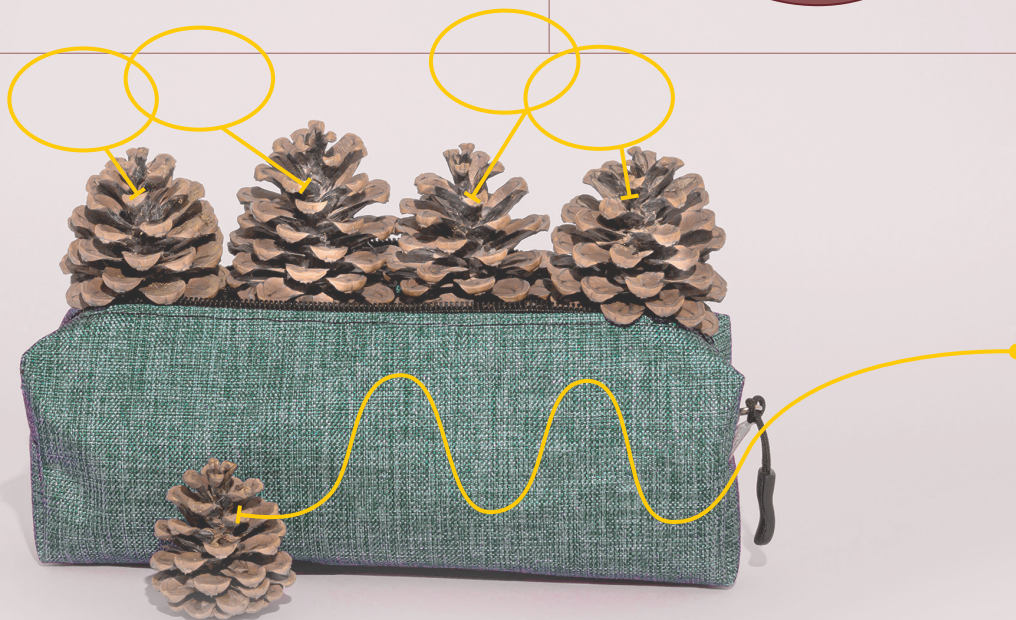
Teachers' pulse in good and poor sound environments



THE IMPACT OF BETTER ACOUSTICS

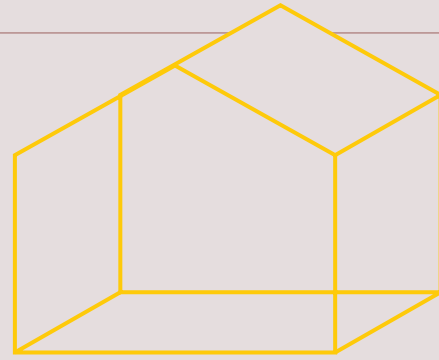
is particularly strong when students are engaging in group work. In traditional, lecture-based lessons, acoustic refurbishment reduced noise levels by up to 6 dB. However, the benefit was even greater when children were working in groups, where reduction in background noise levels increased by up to 13 dB.³

Good acoustics can improve speech intelligibility by more than **35%**⁴





BETTER
ACOUSTICS
REDUCE
INCIDENCES
OF **DISRUPTIVE**
OCCURRENCES
IN THE
CLASSROOM³



BUILDING A CLASSROOM ENVIRONMENT

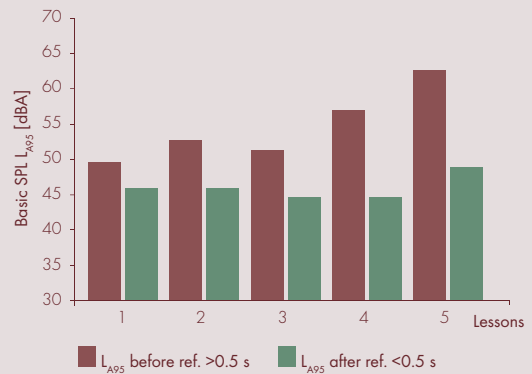
according to the best acoustic recommendations makes it possible for teachers to speak more quietly and still be heard above the background noise. It also makes children speak more quietly in the classroom (i.e. reverse Lombard effect).⁵

THE LOMBARD EFFECT

occurs when acoustics are bad, noise levels rise even higher as people try to shout louder than each other. This causes an even higher background noise level, and the same thing happens again - they try to out-compete each other again. And so on and on.⁶

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Increase of activity sound levels (L_{A95}) before and after refurbishment³



5 WAYS TO BETTER SOUND IN SCHOOLS

#1 MAKE STUDENTS THE SCIENTISTS

In physics, teach children what sound and noise is.

In biology, how noise impacts health.

In social studies, the importance of limiting noise to promote inclusive learning.

In other words, help them come to their own understanding of the importance of noise reduction.

#2 ENCOURAGE RESPECTFUL INTERACTION

A lot of classroom noise comes from the students themselves, leading to even higher volumes and disruptive behaviour.

Use proven strategies such as the PAX Good Behaviour Game and PAX Voice Game* to make the classroom a peaceful and productive learning environment.

#3 MEASURE, MEASURE, MEASURE!

Every school should have routines for identifying improvements in the sound environment. Acoustic measurements should be carried out regularly to make sure all classrooms follow national guidelines of BB93.

#4 PRIORITISE QUALITY

A common denominator for classrooms with a good sound environment is high quality acoustic ceilings and wall absorbers. High quality means choosing "class A" acoustic products.

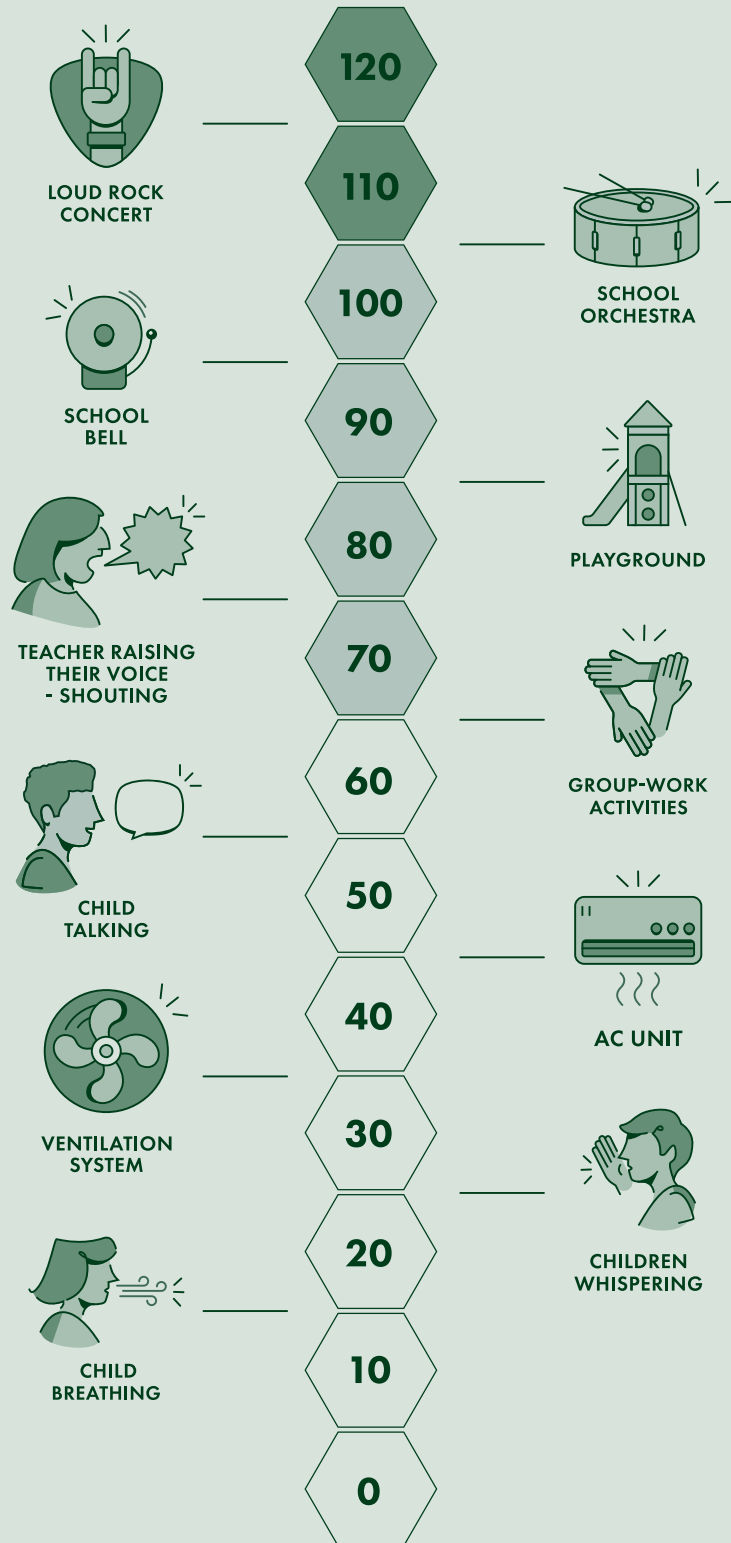
#5 BUILD BACK EQUAL

Classrooms that meet WHO noise recommendations for students with special needs are good classrooms for all children. Design classrooms for equal opportunity learning by using the Universal Design for Learning (UDL) as a guideline.

* <https://www.paxis.org/about-paxis/>



SOUND LEVELS IN DECIBELS



Learning from

NATURE

Our hearing system has evolved over thousands of years in outdoor environments where there are no sound reflections from ceilings and walls, but most listening these days is done indoors. In learning spaces sound reflections and background noise build up, making hearing, speaking and understanding harder.

All Ecophon solutions start from the understanding that we do better in sound environments that mimic the outdoors. For educational settings, our goal is to replicate outdoor acoustic characteristics indoors so that ambient noise is controlled sufficiently for optimal speech clarity. This lowers sound levels, and increases speech intelligibility and speaker comfort. The resulting calmer, quieter and more relaxing atmosphere improves student and teacher concentration, motivation and well-being – just as nature intended.





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ACOUSTIC CEILINGS

An acoustic ceiling is the most effective way to reduce noise levels and create a sound environment that will improve both well-being and work performance.

Ecophon Master™ is ideal for education. Master comes in a wide range of edge designs and with our Akutex™ FT surface that has a premium look and feel. It is easily combined and surface matched with other solutions such as Focus, Combison and Solo.



ACOUSTIC WALLS

Together with an acoustic ceiling, Ecophon Akusto™ sound absorbers for walls give an optimised sound environment for the educational needs.

The unique Akusto™ Wall C Extra Bass effectively absorbs lower bass sounds which is important to an educational environment.

A fairer

START

Everyone deserves the opportunity to learn. But some people are more vulnerable than others to distracting noise that interferes with their ability to hear, understand and participate. The potential to be their best can be compromised, especially if they are students with special hearing, communication and learning needs to start with.

Ecophon solutions can help make it easier to hear instructions above background noise, and optimise the acoustics of the learning space to minimise stress and misunderstanding, improve motivation and general learning, and support a stronger rapport with teachers. With Ecophon, noise doesn't ever need to be a barrier to equal-opportunity learning and development.

- Noise affects vulnerable students the most
- Exam results from students with additional needs plummet when environments become noisy
- In every classroom there are likely to be a number of students with special education needs (SEN)
- Noise and reverberation recommendations for SEN students also apply to all students – designing for the most vulnerable benefits everyone





A good
**sound
environment**

is fundamental
to developing critical
21st century skills

Smart sound

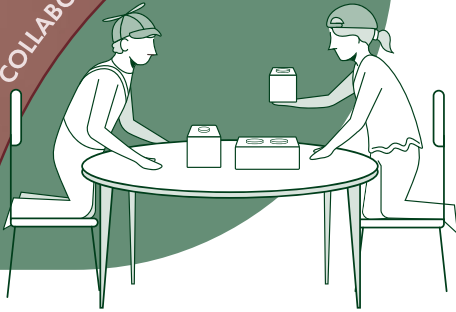
DESIGN

Average noise levels in the majority of classrooms are louder than outdoor playgrounds. A majority of that noise is generated by lingering reverberation of both student and teacher generated sound, where delayed and new noise, especially at disturbing low frequencies, overlap and grow. Research shows this has negative effects on health, well-being and effective learning.

Ecophon offers solutions that are unique in their ability to absorb low frequency sound effectively, reducing reverberation. Our proprietary Activity Based Acoustic Design model helps you determine the right configuration for optimum acoustics of any educational space, based on its physical characteristics and how it will be used. For every upgrade in noise reduction comes a tendency for students and teachers to interact more quietly and with less strain on vocal cords. This snowball effect further quietens the room – promoting more productive class discussion, group work and teaching that's comfortable to share and grow with.

FOCUS

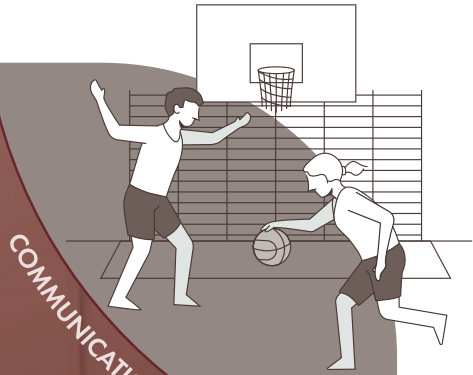
COLLABORATION



CONCENTRATION



INTERACTION



COMMUNICATION

INDIVIDUALLY



CHILL OUT

SOCALISING

SPACES TO GROW IN

The importance of optimising acoustics for every learning space is unquestionable. But no two are exactly alike, and require different approaches depending on the space itself, how it will be used and the needs of the people using it.

Learn more about specific considerations for every space type on this page. Acoustic solutions for each area are featured on page 25.

TYPICAL CLASSROOM

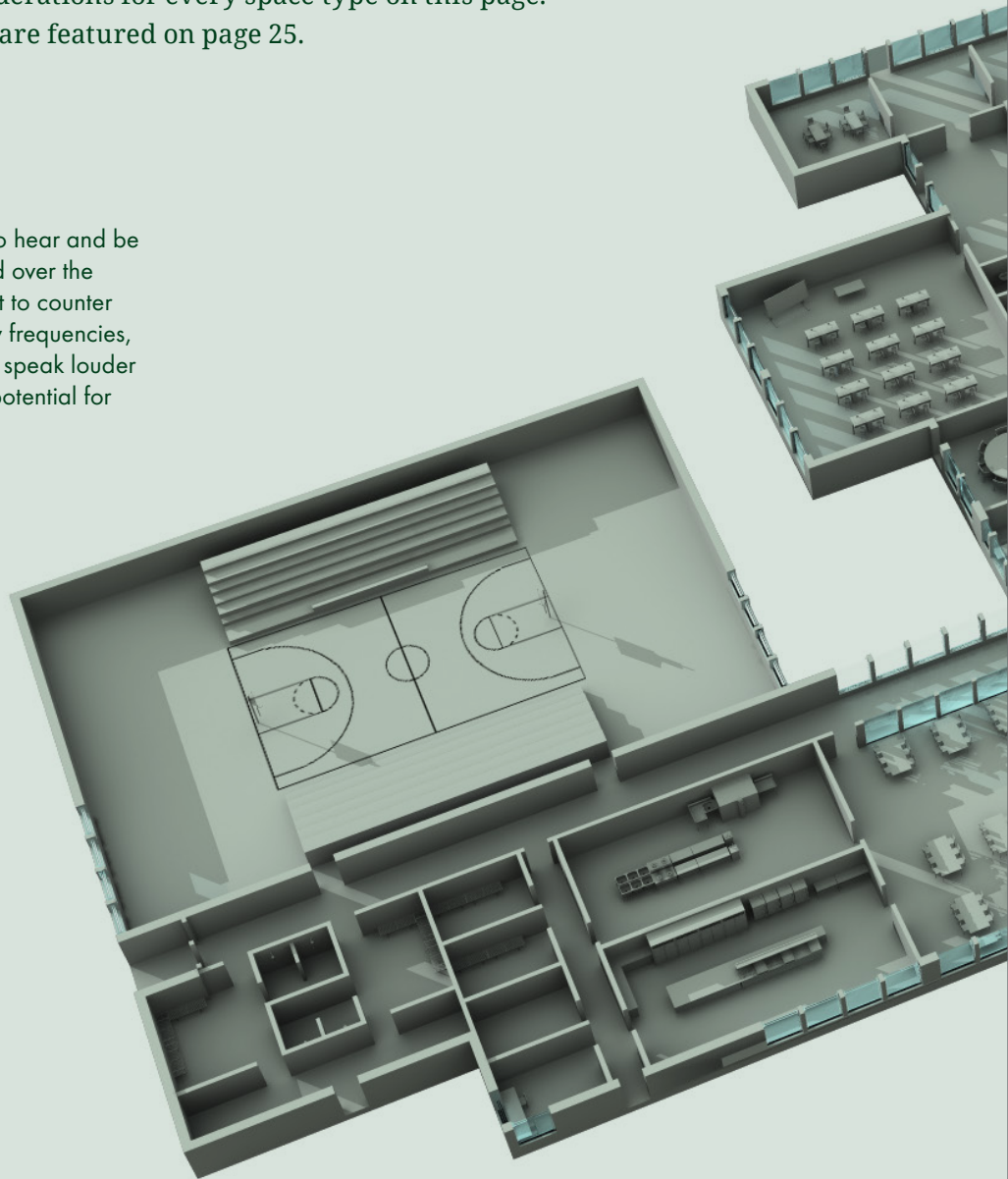
Children and teachers need to be able to hear and be heard, and feel comfortable and focused over the course of a day. It is especially important to counter background noise, particularly in the low frequencies, that can build up and create the need to speak louder which can lead to increased stress and potential for misunderstanding.

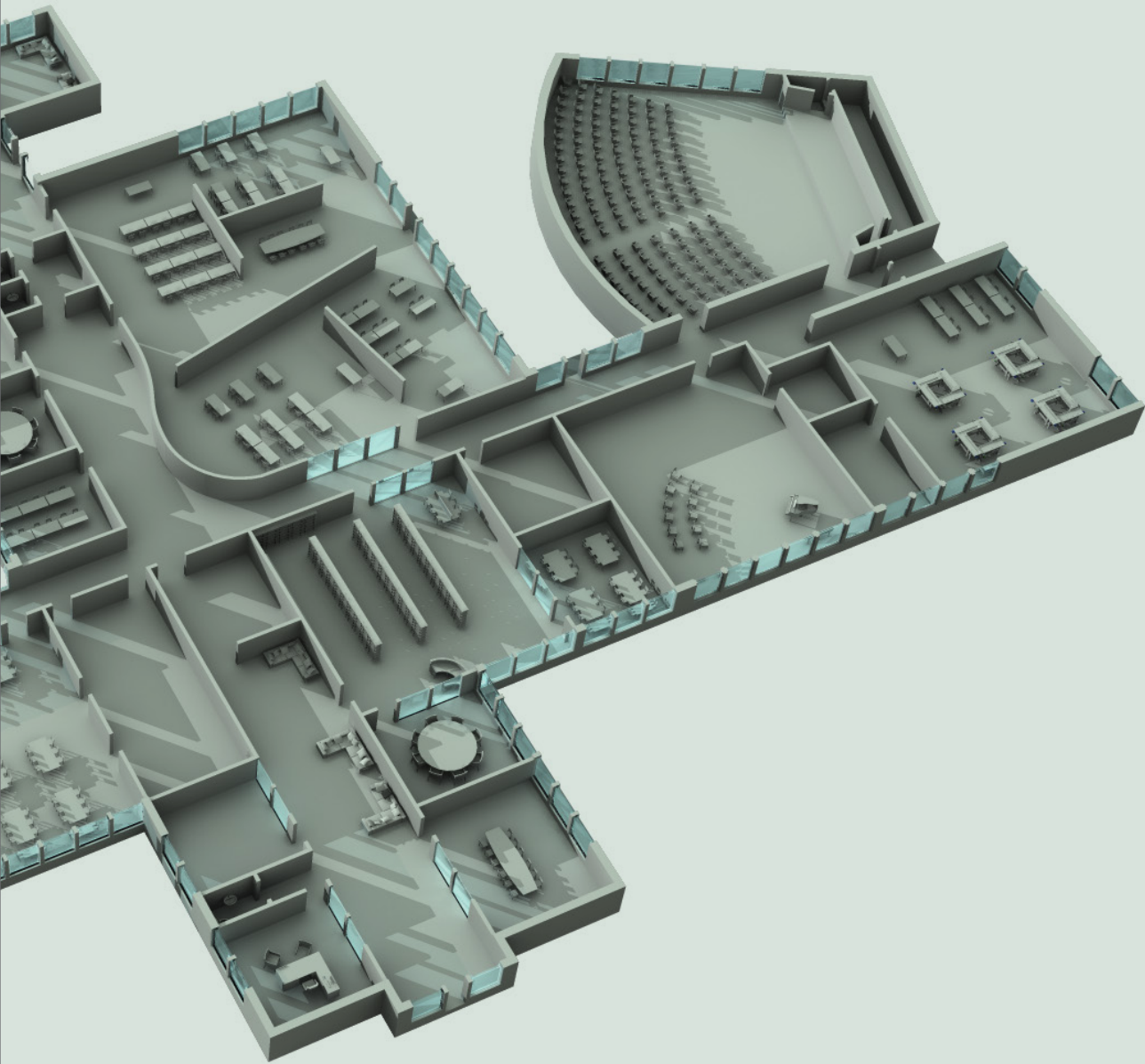
SPORTS HALL

Sports hall acoustics need to be good for group collaboration encouraging communication and teamwork, otherwise students can't hear instructions or warnings. Sound levels need to be as low as possible to prevent echoes, enabling people to speak in a normal tone and still make themselves heard.

MUSIC CLASSROOM

A music room experiences a variety of instrument sounds and noise levels simultaneously. However, it may also be used for musical theory teaching. In general, music rooms need high quality ceiling and wall absorbers.





GETTING THE LOWS RIGHT

Of all the sound challenges addressed in acoustic optimisation for education, low frequencies may be the most important. In learning environments, many everyday sounds have a troublesome low-frequency component – think ventilation systems, voices, dragged chairs, footsteps, and traffic noise – and they travel easily, including through walls.

The problem is low frequency sounds take longer to decay. They block our ability to hear higher frequencies – which a large percentage of spoken language consists of in the form of consonants. The result is poorer speech perception, which is problematic for younger children, whose hearing is still developing, and students with special hearing and communication needs (SHCN), who are likely part of most classrooms.

SPECIAL LISTENING NEEDS ARE DEFINED AS:

- Hearing impairment – permanent and fluctuating
- Auditory processing disorder
- Speech, language and communication difficulties
- Attention deficit hyperactivity disorders
- Autism spectrum

SCHN or not, all children are vulnerable to hearing and communication problems due to low frequency sound proliferation. Designing for the most vulnerable benefits everyone.

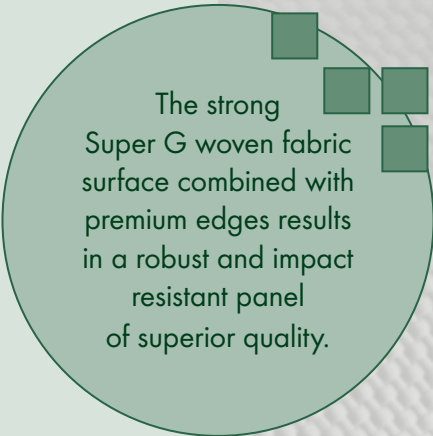




ECOPHON SOLUTIONS

Ecophon Master™ Rigid is specially developed for classrooms, where good acoustics and speech intelligibility are vitally important. Just as the other Master products, it can be combined with our unique low frequency absorber Ecophon Extra Bass.

Akusto™ Wall C Extra Bass is a unique wall absorber that effectively absorbs sound also in the low frequencies. It helps increase speech understanding, lower noise over a very broad frequency range and makes hearing more inclusive where it's needed most – in our educational settings.



The strong Super G woven fabric surface combined with premium edges results in a robust and impact resistant panel of superior quality.

WHEN CONDITIONS ARE TOUGH

High demands regarding impact resistance do not have to mean a poor sound environment. Ecophon Super G™ delivers powerful sound absorption in tough conditions. Choose Super G for school corridors, sports halls and other environments where there's a risk of mechanical impact. The robust systems have a low system weight which makes them easy to handle and install.

All Ecophon Super G products are tested and graded between 1A-3A.

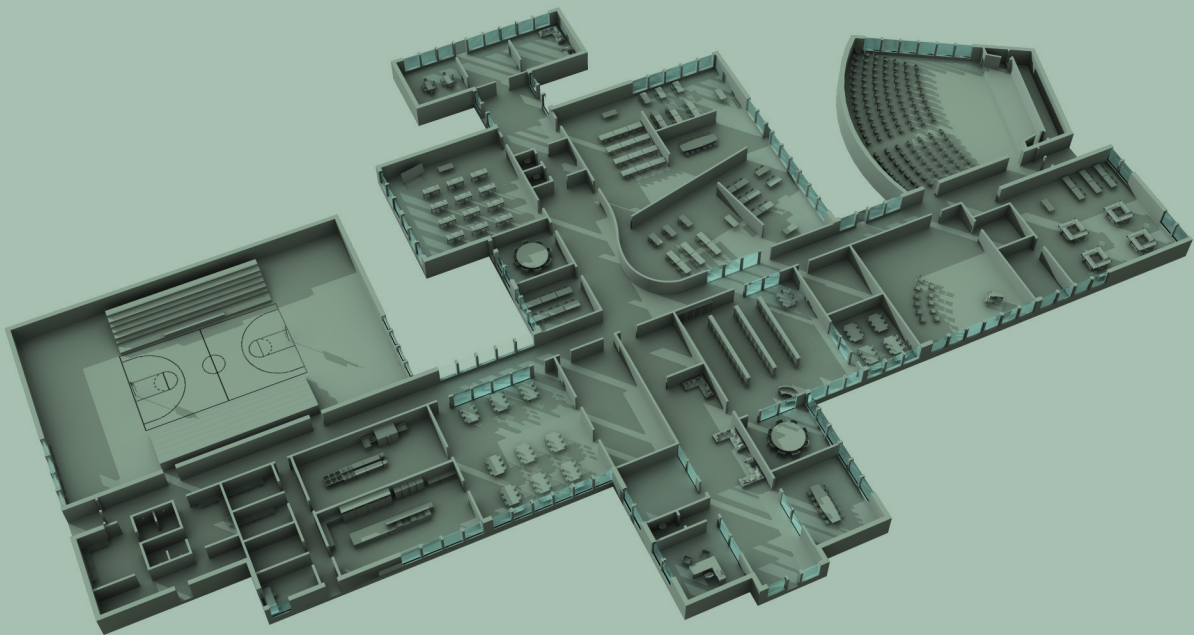
-
- 1A** High velocity sports halls such as handball or tennis courts.
 - 2A** Where low energy ball games take place such as volleyball or softball.
 - 3A** Where low levels of impact resistance is needed such as corridors in schools or day care centres.
-

Ecophon Super G™ Plus A is developed for environments where maximum impact resistance is needed and is 1A classified for high mechanical impact.



SELECT THE BEST ECOPHON SOLUTIONS FOR YOUR NEEDS

SPACE	MASTER RIGID	AKUSTO WALL	GEDINA	SUPER G	FOCUS	MASTER	SOLO	AKUSTO ONE	HYGIENE PROTEC	HYGIENE PERFORMANCE	HYGIENE ADVANCE
CLASSROOM	•	•	•								
CORRIDOR AND HALLWAY	•	•		•	•						
SPORTS HALL		•		•							
CAFETERIA		•		•		•					
NURSERY		•	•			•					
OPEN PLAN CLASSROOM		•	•			•					
MUSIC CLASSROOM		•				•					
ENTRANCE		•				•	•	•			
STAFF ROOM		•			•			•			
WORKSHOP		•		•							
LABORATORY									•		
CHANGING AND SHOWER ROOMS				•						•	•
KITCHEN										•	•



**FOCUS E**

Recessed visible grid system creating a shadow effect on the edge. Easily demountable tiles.

AKUSTO WALL C

Seamless framed wall panel solutions in wide range of colours.

SOLO BAFFLE

Design possibilities with colours and different sizes in a vertical installation.



HIUKKAVAARA SCHOOL AND COMMUNITY CENTRE

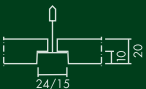
Hiukkavaara Community Centre's defining feature is its versatility. The school building, designed for 700, houses not only a primary and lower secondary school with 350 students, but also a day-care and nursery, a youth centre, and a library. Local residents can make use not only of the spaces, but also of community and adult education activities and sports facilities.

Work on the centre was completed in the summer of 2017, and was guided by objectives relating to sustainability, environmental impact and energy efficiency. This led to the building being granted a gold rating under the international green property certification system LEED for Schools.

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LISTENING BEGINS AT THE PLANNING STAGE

In open learning environments specifically, acoustics require particular attention. An acoustic designer was closely involved from the start to address management of unnecessary distractions, prevention of teacher voice problems and more through acoustic optimisation. Users' needs were also taken into account: teachers, students, and day-care centre staff were all consulted. Everyone using and managing the spaces is happy with the results.





CONTRASTING
whereas
alternatively
unlike
on the other hand
conversely
nevertheless
however

EMPHASIZING
above all
particularly
especially
significantly
indeed
notably

THERE IS
GREAT
POWER IN
THE WORD
"YET".

Improving now

FOR A BETTER TOMORROW

Empowering our future begins with protecting it. That's why sustainability has to be one of the core principles of quality education – if taught, shared and applied collectively, it will benefit us all. Good acoustics have a natural place in that effort, and setting the right example in educational settings is a good investment that pays dividends today, while contributing to a more healthier tomorrow.

The Ecophon approach starts with a fundamental respect for people. That means use of nature, people-friendly materials, and adapting our production processes and logistics to minimise our environmental footprint as much as possible. In fact, every step from research and development to installation of our solutions is considered from its sustainability impact. We firmly believe in the power of sustainable acoustic treatments to optimise our learning settings. But not at any cost, in education more than anywhere, making what's important heard has to start in doing what's important, right.



GET TO KNOW US

Let's Connect. Saint-Gobain Ecophon develops, manufactures and markets acoustic products and systems that contribute to a good working environment by enhancing peoples' well-being and performance. Our promise »A sound effect on people« is the core backbone of everything we do.

Use our digital tools for the different phases of the building process, from the inspiration phase to specific maintenance instructions for your Ecophon products.

www.ecophon.com/uk

By following us on Social Media you stay abreast of all the latest acoustic findings, acoustic research and product development, and can also see inspirational new reference cases.

<https://www.linkedin.com/company/saint-gobain-ecophon-uk-and-ireland/>

www.youtube.com/c/EcophonTV

www.twitter.com/EcophonUK

Take a look at our blog Acoustic Bulletin, a global platform where posts and channels are a valuable tool for end-users, architects and acousticians to quickly access knowledge, opinions and solutions for room acoustic design.

www.acousticbulletin.com





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6. The evolution of the Lombard effect: 100 years of psychoacoustic research. Brumm, H., & Zollinger, S. *A. Behaviour*, 148(11-13). 2011.



Ecophon is the leading supplier of indoor acoustic solutions that improve working performance and quality of life. We believe in the difference sound can make to our everyday lives, and are passionate advocates for the importance of room acoustics to people's wellbeing – whatever the space, activity or need.

Having a sound effect on people is the principle that guides all we do. We're proud of the Swedish heritage and human approach that promise is founded on. Our uncompromising commitment to transparent sustainable practice. And, as members of the Saint-Gobain Group, to be doing our part in making the world a better home.