

# Making room for knowledge

with **Ecophon** acoustic solutions



**Ecophon**<sup>®</sup>  
SAINT-GOBAIN

A SOUND EFFECT ON PEOPLE



# Bring the outdoors in

## to enhance wellbeing and performance

*Over hundreds of thousands of years, our ears have evolved to provide perfect hearing outdoors, in nature. But today most of us spend up to 90% of our time indoors, in environments not suitable for the human ear. Ecophon provides sound-absorbing systems that create indoor environments resembling what we experience in a natural outdoor setting.*

Kindergarten; primary school; lower, middle and upper secondary school; university – as our children grow up, they spend many years in school. In order to be successful later in life it is crucial that they are able to listen, focus, remember and apply what they have learned.

But today much of the educative process takes place in spaces that are not optimised for learning. Studies show that students in poor sound environments cannot hear their teacher clearly, experience a reduction in short-term and long-term memory, are less focused, have lower reading ability, increased stress levels and ultimately, lower test scores.

For students in a good sound environment, the opposite is true. Their understanding of what the teacher is saying can increase by as much as 25%, they remember more, they are more focused, they read better and they get higher scores in tests.

This is the reason Ecophon want to support teaching and learning in every kind of school, in every kind of space – because it seems unfair that our children should not have equal opportunities in life, just because of what their school sounds like.

*Ecophon - a sound effect on people.*

This publication shows products from Ecophon product range and those of other suppliers. The specifications are intended to provide a general guide to which products are most suitable for the preferences indicated. Technical data is based on results obtained under typical testing conditions or long experience in normal conditions. The specified functions and properties for products and systems are only valid on condition that instructions, installation diagrams, installation guides, maintenance instructions and other stated conditions and recommendations have been taken into consideration and followed. Deviation from this, such as changing specific components or products, will mean that Ecophon cannot be held responsible for the function, consequences and properties of the products. All descriptions, illustrations and dimensions contained in this brochure represent general information and shall not form part of any contract. Ecophon reserves the right to change products without prior notice. We disclaim any liability for misprints. For the latest information go to [www.ecophon.com](http://www.ecophon.com) or contact your nearest Ecophon representative.

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# 1

## Control background noise

A crucial factor in achieving clarity of communication is to reduce low-frequency background noise that distorts speech and makes listening hard, such as echoes, murmurs, movements and sound from ventilation fans and projectors. That's why Ecophon has developed Master Rigid and Gedina + Extra Bass. By combining a wall-to-wall ceiling with extra low-frequency absorption on top of the ceiling, the two systems effectively absorb low-frequency sounds – making them ideal for classrooms, open-plan learning spaces and kindergartens.

# 2

## Treat the whole school

Students of different ages have different needs. The same is true of most subjects that are taught. And a classroom is different from a canteen, a corridor or a sports hall. This is why the design of every space in a school needs to be based on the activity that takes place there, the people involved and the qualities of the space itself. Ecophon solutions will let you create the proper sound environment for every space, achieving an atmosphere where teachers and students can thrive all day long, every day.

# 3

## Choose safe products

Good indoor air quality is essential if teachers and students are to be able to perform at their best. Since some products emit a lot more chemicals and substances than others, it is important to choose the right type of building material and products for a school. We are proud that 96% of our 3<sup>rd</sup> generation glass wool products comply with the California Emission Regulation standard and French VOC A+, the two toughest standards in the world for formaldehyde and VOC emissions.

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# Education facts

## Benefits from using Ecophon sound absorbers

In education it is essential to reduce the disturbance from background low-frequency noise and to have a good sound environment overall. If you achieve this, there will be substantial benefits for both students and teachers. These benefits include:

### For students

- Greater understanding of speech
- Better working memory
- Enhanced reading ability
- Lower stress levels and blood pressure

### For teachers

- Better speech clarity
- Easier understanding of students
- Fewer voice problems
- Lower stress levels and blood pressure

<sup>1</sup> Shield, B.M. and Dockrell, J.E.: The effects of environmental and classroom noise on the academic attainments of primary school children. *Journal of the Acoustical Society of America* 123(1), 133-144, USA (2008)

<sup>2</sup> MacKenzie, D. J., Airey, S.: Classroom Acoustics – A Research Study, Heriot-Watt University, United Kingdom (1999)

<sup>3</sup> Klatte, M.; Lachmann, T.: [A lot of noise about learning: acoustic conditions in classrooms and what they mean for teaching] Germany (2009)

<sup>4</sup> Canning, D.; James, A.: The Essex Study – Optimized classroom acoustics for all, United Kingdom (2012)

<sup>5</sup> Tiesler, G., Oberdörster, M.: Bremen University [Acoustic ergonomics in schools], Germany (2006)

<sup>6</sup> Schönwälder, H.-G.; Ströver, F.; Tiesler, G.: [Health promoting influences on performance ability in school education] Germany (2008)

<sup>7</sup> Scottish Government Report: Implementation of The Education (Additional Support for Learning) (Scotland) Act 2004 (as amended) Report to Parliament 2014, United Kingdom (2014)

### Student facts from studies

- Increasing the background noise by 10 decibels results in an average 5–7% drop in Standard Achievement Test scores<sup>1</sup>
- A good sound environment makes students speak 10 decibels lower<sup>2</sup>
- Students' understanding of speech increases by 25% in a good sound environment<sup>3</sup>
- In a good sound environment, students feel more encouraged to work together and be inclusive.<sup>4</sup> The overall sound level in group work is also reduced by 13 decibels<sup>5</sup>
- Students stay more focused and don't get as tired in a good sound environment<sup>6</sup>
- A good sound environment lowers the background noise generated by students by 9 decibels<sup>4</sup>
- On any given day 21% of the school population are what we term sensitive listeners. These may be students taught in a second language, introverts, students with ADHD or autism, students who have a cold and students with a hearing impairment<sup>7</sup>





### Teacher facts from studies

- A good sound environment reduces teachers' heart rates by 10 beats a minute<sup>5</sup>
- Teachers are 32 times more likely to have voice problems than people in similar professions<sup>8</sup>
- 80% of teachers report vocal strain and other throat problems, such as sore throats, voice loss and throat infections. For the general population the number is 5%<sup>9</sup>
- In United Kingdom primary schools 73,000 days per year are recorded as lost teaching days due to teacher voice strain<sup>10</sup>

<sup>8</sup> American Speech-Language-Hearing Association (ASHA), USA

<sup>9</sup> Classroom Acoustics: A New Zealand Perspective, Oticon Foundation in New Zealand (2002)

<sup>10</sup> Royal National Institute for the Deaf (RNID), United Kingdom

<sup>11</sup> The British Association of Teachers of the Deaf (BATOD), United Kingdom



# -10 db

A decrease of 10 dB is perceived by people as half as loud/high.

#### Common sound levels in decibels

Four-engine jet aircraft at 100 m	120 dB	Telephone bell at 10 m	65 dB
Riveting of steel plate at 10 m	105 dB	Male speech, average, at 10 m	50 dB
Pneumatic drill at 10 m	90 dB	Library	40 dB
Circular wood saw at 10 m	80 dB	Typical background noise in a quiet office	35 dB
Heavy road traffic at 10 m	75 dB	Whisper at 10 m	25 dB

In order for people to clearly hear each other, the difference between background sound and speech needs to be 15–20 decibels.<sup>11</sup> So if the background noise is as high as normal speech, you have to speak at almost the volume of heavy traffic for people to hear you clearly.

# Activity Based Acoustic Design

enhance teaching and learning

*The next time you visit a school, just take a look around. Go to different types of spaces, like a classroom, a corridor, a canteen and a sports hall. Listen. What does the environment sound like? Can you hear what teachers and students are saying? Can you hear them clearly, without having to focus all your energy on listening? Is the overall sound level high? Do you feel stressed? If so, then you are not alone. One of the most disruptive and stressful things people experience in education facilities is sound that they don't want to hear. Or in one word - noise.*

Education is in all its essence about two things: teaching and learning. Teachers are supposed to communicate with students who are supposed to listen, think, remember and apply what they have heard. But it is not quite that easy. There are many things to consider when designing a good place for education.

First, that people will perform a lot of different activities. At any given time there can be teaching in classrooms, people moving around in corridors, lunch in canteens, physical education in sports halls, teachers preparing for class, quiet studying in groups or in solitude, lectures in large auditoriums and experiments in laboratories.

So the people involved in the activities vary considerably, as do their needs. And even though teachers' ages are important, the age of the students is maybe the most obvious aspect to ponder, since a four-year old, a fourteen-year old and a twenty-year old are very different. Children can also be what we term sensitive listeners, i.e. children who have learning difficulties, children who are being taught in a second language, children who have a cold or a hearing impairment.

## 1 Activity

What will people be doing in the space (both the teacher and the student)? Is it traditional teaching or group work? Will it be noisy? Will it include the use of equipment and machines? How much time is spent communicating?

Who is involved in the activity?  
Consider both teachers and students.  
How many are there? How old are they? Are they sensitive listeners? Do they have learning difficulties?

## 2 People

## 3 Space

Is the space big or small? Where is it situated, what spaces are next to it and what activities are performed there? Does the building have hard-surfaced walls, ceilings and floors? Are there ventilation fans, projectors, workshop machinery or other frequent sounds in the space?



Finally, you need to think about the building itself – how it is arranged and how the chosen type of building material affects the sound environment. For instance, if all floors, ceilings and walls have hard surfaces, sound will easily bounce off them, spread throughout the space and increase the overall sound level.

### **Supporting the activity**

In order to create a space where people can perform a certain activity to the best of their ability, and be comfortable doing so, Ecophon has developed Activity Based Acoustic Design. This is a method for acoustically designing indoor environments. In practice, it means defining the needs from three perspectives – activity, people and space – and finding the common ground where all perspectives benefit. The solutions are then achieved using a combination of high-quality acoustic elements.





Top:

*Tågaborgsskolan, Sweden*

*Photographer: Teddy Strandqvist/Studio-e.se*

Right:

*Basisschool De Schrank, Netherlands*

*Photographer: Hugo de Jong*



# Face to face

## teaching and learning

On a typical day, children and teachers spend up to eight hours in classrooms. Therefore the rooms need to be designed to help students and teachers feel comfortable and focused, and not make them stressed or tired.

A classroom can be used for both traditional teaching, where the teacher speaks to students who listen, and group teaching, where the teacher moves around and the students sit in groups to discuss specific topics. In a classroom with good acoustic harmony the teacher's voice will easily and clearly reach all students. And in group assignments speech will not increase, spread and disturb everybody else.

Crucial to the achievement of optimum conditions is a reduction in sound levels and the minimisation of background sound, particularly in the low frequencies. The reason for this is that low-frequency sound blurs speech, is most intrusive and makes clear communication much harder.

**Challenge:** To reduce sound levels, to minimise background low-frequency sound, to ensure speech clarity, to ensure speaker and listener comfort, and to prevent the build-up of echoes.

**Solution:** Using a sound-absorbing ceiling with exceptional absorption qualities for all speech frequencies, and particularly low frequencies. For traditional teaching you need wall absorbers

on the back wall and for group teaching you need them on two adjacent walls. For traditional teaching you may also need a speech-reflecting zone in the ceiling above the teacher.

Since classrooms are used both supervised and unsupervised, it is a good idea to make sure the acoustic ceiling is impact-resistant. This will increase its durability.



Product recommendation	Low frequency (125 Hz)	Total acoustic performance	Impact resistance / Durability	Indoor air quality	Ceiling surface
Master Rigid (incl. Extra Bass and Master Rigid/gamma) and Akusto Wall	5	5	5	5	Reinforced Akutex™ FT
Gedina + Extra Bass (incl. Gedina/gamma) and Akusto Wall	5	5	3	5	Akutex™ T
Gedina and Akusto Wall	3	3	3	5	Akutex™ T

The recommendation is for this particular activity and space, based on a comparison between Ecophon products. The scale applied ranges from 1 to 5, where 5 is the highest score. For indoor air quality, 5 equates to compliance with French VOC A+ and California Emission Regulation standard, and 4 equates to French VOC A and M1 (The Finnish Emission Classification of Building Material). For more product information, see page 30.



# Classroom excellence

## With unique Ecophon systems

*Ecophon Master™ Rigid with Ecophon Akusto™ Wall and Ecophon Gedina™ + Extra Bass with Akusto Wall are designed to achieve the best sound environment possible in classrooms. But why are they probably the best choice you can make for your school? How do they work?*

As we have described on previous pages, the most important things in a classroom are low sound levels and speech clarity. This is true for teachers as well as students, both in traditional teaching and group assignment.

If the classroom's floor, walls and ceiling all have hard sound-reflecting surfaces, nothing will stop sound from spreading everywhere, distorting communication. It will bounce around and create echoes that will make everybody raise their voice. In turn this will create an even higher sound level, causing teachers and students

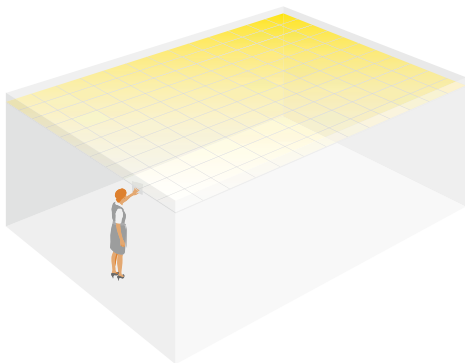
to raise their voices still more. In short, noise builds noise.

### Wall-to-wall ceiling and low-frequency absorber

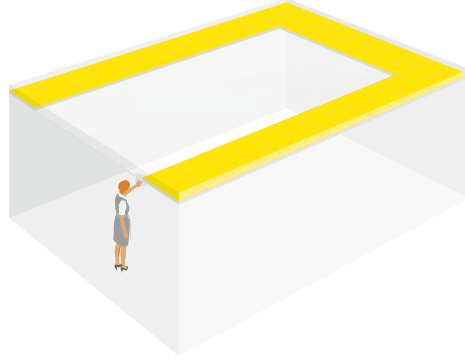
When you install an Ecophon wall-to-wall ceiling, such as Master Rigid or Gedina, this will greatly reduce sound levels. But there will still be intrusive background low-frequency sound. This not only blurs speech, it also makes students and teachers lose focus and become tired. There is only one way to deal with



**Master Rigid or Gedina wall-to-wall ceiling**



**Extra Bass low-frequency absorber**





this, and that is to add extra low-frequency absorption. Ecophon Extra Bass is a unique specially designed 50 mm thick absorber that is placed on top of the ceiling. Extra Bass is included in both systems and should cover at least 50% of the ceiling.

### Wall absorbers

However, even with a wall-to-wall ceiling and Extra Bass, sound will still bounce off the walls and create unwanted echoes that disrupt both speech clarity and listener comfort. The problem is solved by using Akusto Wall sound absorbers on the back wall. This will hinder the formation of echoes and thus increase speech clarity and listening comfort.

In group assignments students will speak in all directions. If the classroom is used in this way it is preferable to place Akusto Wall on two adjacent walls.

### Speech-reflecting zone

Finally, to ensure total speaker comfort, the systems

also include the possibility of adding a small speech-reflecting zone in the ceiling above the place where the teacher normally stands. This will let the teacher hear his or her own voice more clearly, thus reducing the risk of the teacher unnecessarily straining their voice.

### Impact resistance

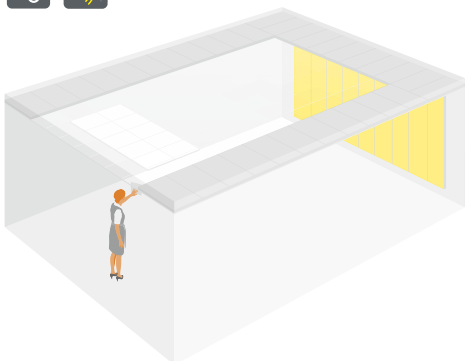
Classrooms are often both supervised and unsupervised. It can therefore be a good idea to install an impact-resistant ceiling. Master Rigid has an extra reinforced surface and is secured in the grid system with patented Connect™ accessories. And don't worry; even though the ceiling is secured, it can still be removed, allowing you access to the void above.



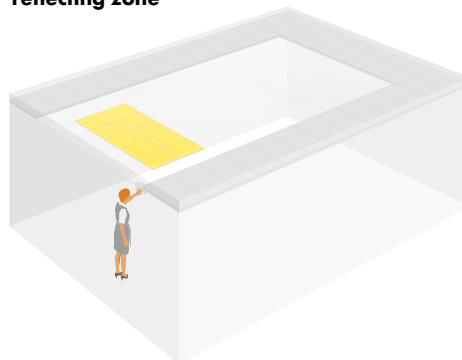
Want to see how it's done?  
Watch installation films on  
[youtube.com/ecophonTV](https://youtube.com/ecophonTV)  
and [ecophon.com](https://ecophon.com).



**Akusto Wall absorbers**



**Master Rigid/gamma or Gedina/gamma speech-reflecting zone**







Top:

*Hauptschule St. Margarethen a.d.R., Germany*

*Photographer: Hans Georg Esch*

Right:

*Hagaskolan, Sweden*

*Photographer: Gunnar Almqvist, IBAFOTO*

# Moving around, communicating and concentrating

As students and teachers leave one class they should be able to relax and prepare for the next one. But since corridors and breakout spaces are increasingly used as learning environments and group work areas during lesson hours, they have become areas that are highly multipurpose. At any given time there can be people moving from class to class, students talking and playing around, group work and individual students trying to concentrate. If left unchecked, a cacophony of noise will easily be created. The noise will spread throughout the space and can also enter adjoining classrooms.

The key to turning these spaces into good sound environments is to stop sound from spreading.

**Challenge:** To reduce sound levels and to prevent sound from spreading.

**Solution:** Using a sound-absorbing ceiling with good absorption qualities and high efficiency in reducing sound propagation, and wall absorbers wherever needed and possible.

Corridors and breakout spaces need to be able to cope with the unexpected. It is therefore a good idea to make sure that the ceiling is impact-resistant. This will increase its durability.



## Product recommendation

Product recommendation	Total acoustic performance	Impact resistance / Durability	Indoor air quality	Ceiling surface
Super G 20 mm and Akusto Wall	5	5	4	Super G
Master Rigid Dp XL and Akusto Wall	5	5	5	Reinforced Akutex™ FT
Focus and Akusto Wall	5	3	5	Akutex™ FT

The recommendation is for this particular activity and space, based on a comparison between Ecophon products. The scale applied ranges from 1 to 5, where 5 is the highest score. For indoor air quality, 5 equates to compliance with French VOC A+ and California Emission Regulation standard, and 4 equates to French VOC A and M1 (The Finnish Emission Classification of Building Material). For more product information, see page 30.



Top:

*International School of Düsseldorf, Germany*

*Photographer: Hans Georg Esch*

Right:

*Liemers College, Netherlands*

*Photographer: Ben vulkers*



# Exercising and energizing

Most of the activities that take place in a sports hall are very noisy. Ball games are among the worst in this respect. The high sound levels often make it impossible for students and players to hear each other, and for teachers and coaches to give instructions promptly and clearly without having to shout loudly. And since it is hard to make yourself heard, it is also harder for teachers to prevent accidents that are about to happen. The students will simply not hear the warning.

In a sports hall with a good sound environment, the sound level is as low as it can be, echoes are prevented and people can speak in a normal tone of voice and still make themselves heard.

Due to the lively activities taking place in sport halls it is important that the acoustic solution is impact-resistant and secure. It should be able to withstand repetitive hits by different kinds of balls.

**Challenge:** To reduce sound levels and to improve speech intelligibility by keeping sound from bouncing off the walls.

**Solution:** Using an impact-resistant sound-absorbing ceiling with very good absorption qualities, and impact-resistant wall absorbers on two adjacent walls.



## Product recommendation

Product recommendation	Total acoustic performance	Impact resistance / Durability	Indoor air quality	Ceiling surface
Super G Plus and Akusto Wall/Super G	5	5	4	Super G
Super G 35 mm and Akusto Wall/Super G	5	4	4	Super G

The recommendation is for this particular activity and space, based on a comparison between Ecophon products. The scale applied ranges from 1 to 5, where 5 is the highest score. For indoor air quality, 5 equates to compliance with French VOC A+ and California Emission Regulation standard, and 4 equates to French VOC A and M1 (The Finnish Emission Classification of Building Material). For more product information, see page 30.



Top:

*Matildelunds förskola, Sweden*

*Photographer: Ulf Celander*

Right:

*Pedagogen, Gothenburg University, Sweden*

*Photographer: Bert Leandersson*



# Relaxing and enjoying a meal

A canteen or cafeteria is a place where students and teachers should be able to relax, find new energy and enjoy both the food and the company of others. Speaking and listening comfort must be good so everybody can participate in the conversations.

The typical canteen is a large open space with a high soffit. There are many conversations at the same time and there is constant noise from tableware and cutlery. People will be walking to and from their tables, chatting to friends while they walk. Without proper sound absorption, sound will bounce off hard surfaces, creating echoes that will spread in all directions. This will cause sound levels to increase dramatically, resulting in a very stressful and uncomfortable environment.

**Challenge:** To prevent the sound level from escalating and to keep sound from spreading in all directions and to adjacent areas.

**Solution:** Using a highly sound-absorbing ceiling and wall absorbers covering as much of the walls as possible. Location-wise it is recommended that canteens are placed away from areas that are especially sensitive to intrusive noise.



Product recommendation	Total acoustic performance	Impact resistance / Durability	Indoor air quality	Ceiling surface
Master and Akusto Wall	5	3	5	Akutex™ FT
Gedina + Extra Bass and Akusto Wall	5	3	5	Akutex™ T
Gedina and Akusto Wall	3	3	5	Akutex™ T

The recommendation is for this particular activity and space, based on a comparison between Ecophon products. The scale applied ranges from 1 to 5, where 5 is the highest score. For indoor air quality, 5 equates to compliance with French VOC A+ and California Emission Regulation standard, and 4 equates to French VOC A and M1 (The Finnish Emission Classification of Building Material). For more product information, see page 30.





Top:

*Basisschool De Schrank, Netherlands*

*Photographer: Hugo de Jong*

Right:

*Metroqubo, Denmark*

*Photographer: Weiles fotografi*

# Playing and learning

## about the world

Children are great. They are always curious to explore and learn new things. However, they have a tendency to be quite loud. So when you have a lot of children together in a kindergarten or preschool, the sound levels can easily escalate. This makes it hard for the children to hear each other and for teachers to teach and give instructions. The result is a loud, tiring and unbearable atmosphere where teachers constantly have to raise their voice to be heard.

To give the children and teachers a space where they can feel at home and have fun teaching and learning, it is crucial that sound levels are reduced and sound is prevented from spreading throughout the space.

**Challenge:** To reduce sound levels and to stop sound from bouncing off the walls, creating echoes.

**Solution:** Using a sound-absorbing ceiling with good absorbing qualities in all speech frequencies and wall absorbers on at least one wall, but preferably two adjacent ones.



### Product recommendation

Product recommendation	Total acoustic performance	Impact resistance / Durability	Indoor air quality	Ceiling surface
Master and Akusto Wall	5	3	5	Akutex™ FT
Gedina + Extra Bass and Akusto Wall	5	3	5	Akutex™ T
Gedina and Akusto Wall	3	3	5	Akutex™ T

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Top:

*Berufliche Schulen des Werra-Meißner-Kreises in Witzenhausen, Germany*

*Photographer: Hans Georg Esch*

Right:

*Berufliche Schulen des Werra-Meißner-Kreises in Witzenhausen, Germany*

*Photographer: Hans Georg Esch*



# Learning by focused collaboration

A trend in today's school world is to have open-learning landscapes. These spaces are shared by more than one class of students and their teachers. The most common activities in these spaces are different kinds of group work. Since group work is collaborative, communication is a key factor for its success. If acoustics is not dealt with properly, sound will spread throughout the space and disturb all the other classes and groups. This will lead to a build-up of intrusive sounds, and particularly low-frequency sound, making students have to raise their voices, in turn escalating sound levels. All in all it would lead to a space where students have trouble focusing, and where teachers have trouble helping and instructing the students.

In an open-plan space, sound needs to be contained as close to the source as possible. This will reduce the risk of escalating speech levels and enable group and teacher communication with high speech clarity and listening comfort.

**Challenge:** To reduce sound levels, to stop sound from spreading throughout the space and to increase speech clarity.

**Solution:** Using a sound-absorbing ceiling with good absorbing qualities in all speech frequencies and wall absorbers next to as many group seatings as possible.



Product recommendation	Low frequency (125 Hz)	Total acoustic performance	Impact resistance / Durability	Indoor air quality	Ceiling surface
Master A, E, Ds and Akusto Wall	5	5	3	5	Akutex™ FT
Gedina + Extra Bass and Akusto Wall	5	5	3	5	Akutex™ T
Gedina and Akusto Wall	3	3	3	5	Akutex™ T

The recommendation is for this particular activity and space, based on a comparison between Ecophon products. The scale applied ranges from 1 to 5, where 5 is the highest score. For indoor air quality, 5 equates to compliance with French VOC A+ and California Emission Regulation standard, and 4 equates to French VOC A and M1 (The Finnish Emission Classification of Building Material). For more product information, see page 30.



Top:

*University Kuopio, Finland*

*Photographer: Esa Kärki*

Right:

*Warsaw University of Technology, Poland*

*Photographer: Bartosz Makowski*

# Speaking, listening

## and understanding

At universities a significant proportion of knowledge-related information is conveyed in large auditoriums or lecture halls. In these settings lecturers address students who often sit far away. In order for the students to learn, it is therefore vital that the lecturer's voice is reflected so that it reaches the whole audience comfortably and clearly, without the need for the lecturer to speak louder.

To achieve this, there should be as little distortion as possible from echoes and background noise, particularly low-frequency sounds such as ventilation, projectors and other technical equipment. If a speaker amplification system is used it is very important that it is adjusted to suit the individual needs of each auditorium or lecture hall.

**Challenge:** To improve speech clarity, to improve listening comfort and to minimise echoes.

**Solution:** Using a sound-absorbing ceiling with exceptional absorption qualities for all speech frequencies, a speech-reflecting zone in the ceiling where the lecturer normally stands, wall absorbers covering the back wall and some wall absorbers on the side walls.



Product recommendation	Low frequency (125 Hz)	Total acoustic performance	Impact resistance / Durability	Indoor air quality	Ceiling surface
Master A, E, Ds (incl. Master/gamma) and Akusto Wall	5	5	3	5	Akutex™ FT
Gedina (incl. Gedina/gamma) and Akusto Wall	3	4	3	5	Akutex™ T
Focus and Akusto Wall	4	4	3	5	Akutex™ FT

The recommendation is for this particular activity and space, based on a comparison between Ecophon products. The scale applied ranges from 1 to 5, where 5 is the highest score. For indoor air quality, 5 equates to compliance with French VOC A+ and California Emission Regulation standard, and 4 equates to French VOC A and M1 (The Finnish Emission Classification of Building Material). For more product information, see page 30.



# Feeling welcome, socializing and moving along

On a typical morning a lot of people arrive at school at the same time. A lot of conversations will take place at the same time as people are moving around to get to where they are going. This easily leads to very high sound levels and creates an uncomfortable and stressful environment. The acoustic solution is to lower sound levels and stop sound from spreading. To set people in the right mood for the day, the design of the entrance should also be inspiring visually.

## Product recommendation

Solo, Master Matrix, Focus, Akusto Wall and Akusto One



Malmö Högskola, Sweden, Photographer: Teddy Strandqvist/Studio-e.se

# Playing, singing and learning music

Music rooms are often used for many purposes. There can be whole classes singing, acoustic instruments, amplified instruments or lectures on music theory. The sounds will vary in loudness and frequencies and, in finding the ideal solution, it is important to decide on the activity with the highest priority. In general, however, any music room needs a highly absorbing ceiling and wall absorbers.

## Product recommendation

Master and Akusto Wall



Rydebäckskolan, Sweden, Photographer: Partick Klemm, Partone

# Discussing and preparing for class

Staff rooms are a private space away from the students where staff can have a break, relax and have informal and formal meetings and conversations with other teachers outside their timetabled lessons. The acoustic solution needs to reduce sound levels and keep sound from spreading and disturbing colleagues.

## Product recommendation

Focus, Akusto Wall and Akusto One



Malmö Högskola, Sweden, Photographer: Teddy Strandqvist/Studio-e.se

# Hands-on practical work

Whatever the nature of the education activity, the right acoustic environment is crucial for success. Workshops and laboratories involve the use of all kinds of machinery and tools, and there are often important hygiene requirements. It is therefore essential to choose an acoustic solution that ensures both that noise levels are minimised and hygiene demands are met.

## Product recommendation

Laboratories: Hygiene Labotec, Hygiene Performance and Hygiene Meditec

Workshops: Super G and Akusto Wall/Super G



Syddansk universitet, Denmark, Photographer: Teddy Strandqvist/Studio-e.se

# Showering and changing

In changing and shower rooms there are often a lot of hard surfaces, such as ceramic tiles, covering walls and ceilings. Since this makes sound bounce around, noise levels are often very high. A sound-absorbing ceiling in this type of space must have high absorption qualities, as well as being able to withstand high humidity and meet demanding cleaning requirements.

## Product recommendation

Shower rooms: Hygiene Performance and Hygiene Advance

Changing rooms: Super G and Hygiene Performance



Hagaskolan, Sweden, Photographer: Gunnar Almqvist, IBAFOTO

# Cooking, preparing and serving food

A kitchen is a sterile and clean environment. But it is often a busy space where metal items, pots, pans, cutlery, glasses and trays create a lot of noise, making it hard for people to communicate. The acoustic solution for a kitchen should lower sound levels, and of course also meet the relevant hygienic requirements.

## Product recommendation

Hygiene Advance, Hygiene Performance and Hygiene Foodtec



Meander Medisch Centrum, Netherlands,  
Photographer: Lighthouse Productions Dirk Verwoerd

# The sustainable choice

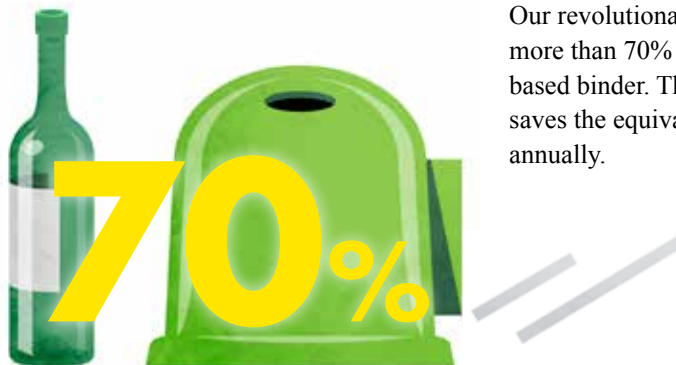
## Green and durable



You hold us responsible. We owe you full transparency regarding our products' environmental impact and the efforts we are making to reduce this impact. This is why we do in-depth life cycle analyses to uncover every aspect of our products' life cycle. Armed with that knowledge, we push ourselves to improve every phase, from sourcing raw materials and production to transportation and waste management.

Follow our journey at [ecophon.com/sustainability](http://ecophon.com/sustainability).

Over the past few years, our efforts to improve the impact of our products at every stage have helped us to reduce emissions, find new materials, create healthier indoor environments and develop a return system for offcuts and used panels. These efforts have earned 96% of our 3<sup>rd</sup> generation glass wool products some of the toughest certificates and classifications in the world. These include the Californian Emission Regulation standard and the French VOC A+.



Our revolutionary 3<sup>rd</sup> generation glass wool combines more than 70% recycled glass with a renewable plant-based binder. The complete lack of fossil raw material saves the equivalent of 24,000 barrels of crude oil annually.





We are very proud that we most probably have the lowest CO<sub>2</sub> emissions in the business, per produced square metre of absorber. The main reasons for this are:

- The use of our renewable plant-based binder in all absorbers
- 70 per cent of our glass raw material is already recycled
- Our factories are largely powered by hydroelectric power and biogas
- Our absorbers are very lightweight, reducing the emissions from transportation

Choosing the most sustainable products for a building is often very hard. To help you succeed we have reported all information about our ceiling products in EPDs (Environmental Product Declarations). When it comes to wall applications there are no standards or requirements for EPDs. However, since we want to give you all the facts, Ecophon is currently developing an EPD for the vertical absorbers in our Akusto range. Until this is in place you can still rest assured that the Akusto absorbers are produced exactly the same way as our ceilings, with the same sustainable benefits.

All Ecophon EPDs are third-party verified by independent organisations. Ecophon EPDs are available at [ecophon.com](http://ecophon.com).



# Return system

We do not ride off into the sunset when installation is complete. We take responsibility for the whole life cycle of our products. This is the reason we have developed a return system for all our products made with 3<sup>rd</sup> generation glass wool. Learn more at [ecophon.com/sustainability](http://ecophon.com/sustainability).



We are not done. There is always a new leaf waiting to unfold. That's why Ecophon will never stop inventing new and even more sustainable solutions – for the planet and for all of us who live here.

# Naturally safe

Ecophon never uses unnecessary chemicals in its products; we simply do not believe in it. Instead we develop products and surfaces that are naturally safe and do not provide breeding grounds for bacteria. Many experts in public health agree with our course of action, including the UK Department of Health, which concluded, regarding the use of anti-microbial chemicals:

“Whilst antimicrobial-impregnated products (such as surface coatings, paints and curtains) and antimicrobial materials are available, there are, at present, no definitive data to support their efficacy in reducing healthcare-associated infection.” (Health Building Note 00-10.)

Our products meet the highest requirements of NF S90-351, zone 4 and the American Society for Testing and Materials (ASTM) G21-96, grade 0.

Ecophon has two ceiling systems that are ideal for TABS buildings (Thermally Activated Building Systems): Ecophon Master™ Matrix and Ecophon Solo™. Based on extensive studies and tests, Ecophon recommends 60% coverage in TABS buildings. This will maintain thermal performance and at the same time provide a good acoustic environment. And if you combine the ceiling coverage with Ecophon Akusto™ Wall and Ecophon Akusto™ Screen you can achieve an atmosphere that is very pleasing to both the ear and the eye.

60%



The Akutex™ label was developed by Ecophon and guarantees that the product carrying it has an easy to clean painted surface with superior acoustics qualities, high light reflectance and great visual appearance.

Akutex T is a well-tried painted and yet porous surface that allows almost 100% of the sound energy to penetrate into and be absorbed by the glass wool core. The high light reflectance of 84% means that Akutex T can lead to cost-effective and more energy-efficient lighting.

Akutex FT is also a painted and porous surface, but the pores are less than half those of Akutex T in size, making the surface appear even smoother. The light reflectance is 85%. A unique aspect of Akutex FT is its near-optimal retro-reflection value. This means that if you paint a wall red, the Akutex FT surface will not reflect the red colour and spread it throughout the room. The colour will, so to speak, stay on the wall. Or, as one architect described it, “It’s almost as if the Akutex FT surface has integrity; it doesn’t let the surroundings affect it”.

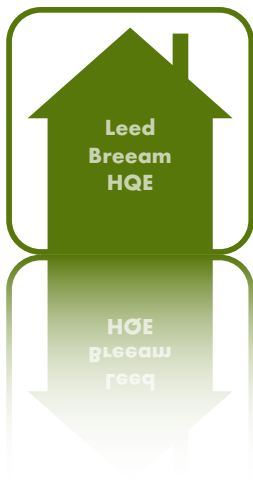
# Durable

Soft and white doesn't mean fragile. Our absorbers are extremely sustainable and will last and perform for many years to come. They don't really need any maintenance except the occasional cleaning. They are easy to install and if you need access to the ceiling void you can easily remove panels and then put them back again. If you need a ceiling solution to be *impact-resistant* or secured in place, we have several solutions for this as well. And they are still removable.

Ecophon has a very comprehensive BIM object product library, available for both Revit and ArchiCAD. The Revit versions provide installation details and transition drawings, while the ArchiCAD versions allow users to manually adjust and configure the entire ceiling structure and hanger placement. In both versions, BIM users have access to information such as sound absorption classes, CO<sup>2</sup> emissions and links to documentation.

Our BIM objects can be downloaded at [ecophon.com](http://ecophon.com) and at [bimobject.com](http://bimobject.com), Europe's largest and fastest growing digital content management system for BIM objects.

## BIM objects



Even green building organisations choose Ecophon. When Green Building Council South Africa built their new offices they designed them with our acoustic solutions. We think they made a good choice, because if you are going green, why not use the most sustainable sound absorbers on the market? Acoustics is a part of all leading certification schemes, such as LEED, BREEAM, DGNB and HQE.



For the latest news on Ecophon, our solutions, design inspiration and the world of acoustics, follow us on: Twitter (@ecophon), Facebook ([facebook.com/Ecophon](https://facebook.com/Ecophon)) and LinkedIn ([linkedin.com/company/ecophon](https://linkedin.com/company/ecophon)).



# Ecophon acoustic solutions

## System overview

Product group	Sound absorption class <sup>1</sup>	max. Sound absorption coefficient <sup>1</sup> / Product group		Available edges	Type of surface
		$\alpha_p$ (125Hz)	$\alpha_w$ 250-4000 Hz		
Master	A	0,60	1,00	A, B, Ds, E, F, SQ	Akutex FT
Master Rigid (incl. Extra Bass)	A	0,65	1,00	A, E, Dp	Reinforced Akutex FT <sup>2</sup>
Master Matrix	A	0,60	1,00	-	Akutex FT
Focus	A	0,50	1,00	A, B, Ds, Dg, E, F, Lp, SQ	Akutex FT
Gedina	A	0,45	0,95	A, E, D/A	Akutex T
Gedina + Extra Bass	A	0,70	1,00	A, E	Akutex T
Advantage (15 mm)	A	0,40	1,00	A, E	Batch painted glass fiber tissue
Hygiene Performance (20 mm)	A	0,50	0,95	A	Akutex TH
Super G (20 mm)	A	0,45	1,00	A	Super G
Super G (35 mm)	A	0,50	1,00	A	Super G
Super G B	A	0,25	1,00	B	Super G
Super G Plus	A	0,55	1,00	A	Super G
Akusto Wall	A	0,25	1,00	A, C	Akutex FT / Super G / Texona

1. At 200 mm o.d.s. (overall depth of system), Master Matrix at 300 mm o.d.s. and Akusto Wall at 50 mm o.d.s. Super G B is glued to the soffit.

2. Reinforced Akutex FT is proven to be 10 times stronger than the standard Akutex FT

3. According to standard EN13964. (Akusto Wall according to DIN 18032 part 3)

4. The French regulation on VOC emissions

5. Comply with the California Emission Regulation Standard (California Department of Public Health)

6. The Finnish Emission Classification of Building Material

## Surfaces by Ecophon



### Akutex™ FT

The Akutex FT surface in combination with the glass wool core provides optimal sound absorption. The retro reflection coefficient for White Frost is 63 mcd/(m<sup>2</sup>lx), which is close to the optimum value. To prevent damage to the surface, the absorbers should be installed out of reach. Akutex FT has very small pores, making the product very dirt-repellent and the surface easy to clean.



### Reinforced Akutex™ FT

This surface is aesthetically identical to Akutex FT but reinforced with an additional glass fibre tissue beneath the visible surface layer. The reinforced Akutex FT is proven to be 10 times stronger than the standard Akutex FT and is the natural choice when strength and an aesthetically pleasing appearance are required.



### Akutex™ T

Akutex T is a well-proven painted surface, which in combination with the glass wool core provides optimal sound absorption. It is a porous surface that allows almost 100% of the sound energy to penetrate into and be absorbed by the glass wool core. The surface is a crucial element in the system, constituting a class A absorbent. The high light reflectance (84%) means that Akutex T can lead to cost-effective and more energy-efficient lighting.

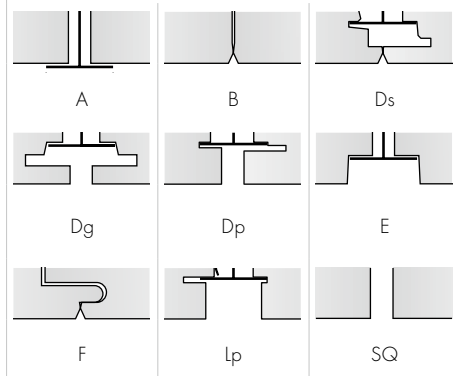


### Akutex™ TH

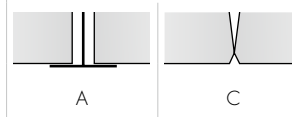
Akutex™ TH is a surface for hygiene applications with moderate cleaning demands. It is a painted, cleanable surface intended for environments where contamination might occur and cleaning or disinfection is required on a regular basis. Wet wiping is most common, but jet washing at low pressure is also applicable.

Impact resistance class <sup>3</sup>	Cleanability		Indoor Air Quality		
	Dry	Wet	French VOC <sup>4</sup>	CDPH <sup>5</sup>	M1 <sup>6</sup>
-	•	•	A+	•	•
3A	•	•	A+	•	•
-	•	•	A+	•	•
-	•	•	A+	•	•
-	•	•	A+	•	•
-	•	•	A+	•	•
-	•	-	A+	•	•
-	•	•	A+	•	•
3A	•	•	A	-	•
2A	•	•	A	-	•
3A	•	•	A	-	•
1A	•	•	A	-	•
-/1A/-	•	•/•/-	A+/A/A+	•/-/•	•/•/•

Ecophon edge design ceilings



Ecophon edge design walls



### Batch-painted glass fibre tissue

The Advantage surface is a batch-painted surface that contains a water-based paint without any harmful additives

### Texona

If you want to create expressive sound-absorbing wall or screen solutions with a wide range of colours, Texona is the perfect choice. Texona has a smooth textured surface, is impact-resistant and available in a variety of colours that allude to flavours.

### Super G

The Super G surface has been designed for environments where mechanical impact occurs. Super G is a glass fibre fabric with high impact resistance. The combination of this strong fabric and a high-density glasswool core creates robust and impact resistant wall- and ceiling absorbers.

For more information about Ecophon surfaces and colours, please visit [ecophon.com](http://ecophon.com).



A SOUND EFFECT ON PEOPLE

*Ecophon dates back to 1958, when the first sound absorbers from glass wool were produced in Sweden to improve the acoustic working environment. Today the company is a global supplier of acoustic systems that contribute to good room acoustics and a healthy indoor environment with the focus on offices, education, health care and industrial manufacturing premises. Ecophon is part of the Saint-Gobain Group and has sales units and distributors in many countries.*

*Ecophon efforts are guided by a vision of earning global leadership in room acoustic comfort through sound-absorbing systems, enhancing end-user performance and wellbeing. Ecophon maintains an ongoing dialogue with government agencies, working environment organisations and research institutes, and is involved in formulating national standards in the field of room acoustics, where Ecophon contributes to a better working environment wherever people work and communicate.*

[www.ecophon.com](http://www.ecophon.com)



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