

A better sound environment

with **Ecophon Hygiene™**



Ecophon Hygiene™

systems that deliver what they promise

Some time ago the working environment in the food industry needed improving. One particular problem was high noise levels. In answer to this in 1984 the Swedish National Food Administration decided, to launch a project to ascertain whether new surface materials would meet the food industry's hygiene and noise control standards. Previously, only hard materials such as tiles, and metal had been permitted. Using Ecophon sound absorbers and acoustic ceilings with Akutex™ coating, the new surface materials were tested both for their dirt-repellent capabilities and their acoustic effect. The National Food Administration readily approved the solutions and concluded that they significantly improved the acoustic working environment.

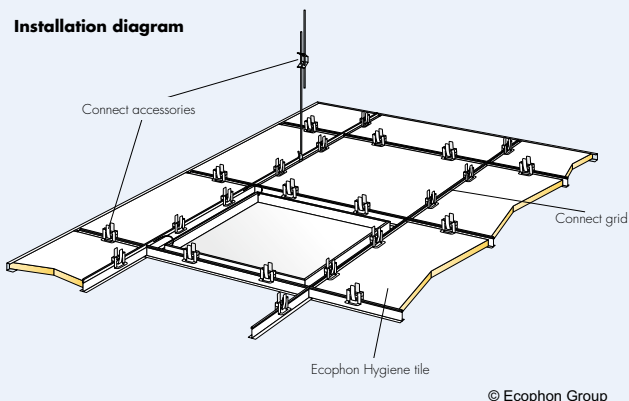
Since then, Ecophon has continued to develop its products, today they offer a variety of acoustic systems for different industries that satisfy varying requirements for hygiene and cleanability in humid and sensitive environments.

Good Reasons for choosing an Ecophon system

- All the components in Ecophon's systems are tested and assessed to specific requirements from the smallest screws to the grids and sound absorbers. All parts are tailored, which guarantees the whole system.
- By offering a complete system from a single supplier the client can feel secure in the knowledge that all the components are compatible.
- Ecophon Hygiene systems have been developed over many years. These ingenious, carefully designed

systems are easy to assemble and eliminate the risks of site errors.

- Ecophon has been operating for over 35 years and is a market leader in Hygiene applications in many countries. Therefore if parts of the system need changing or supplementing, they can be supplied quickly and easily from stock.
- Ecophon CAD drawings and instructions are easy to download via our website, offering support to our customers, trained telephone support staff are happy to provide answers to any queries you may have.



Ecophon installation diagrams illustrate a complete hygiene system, grid, tiles and accessories making ordering easy.

Contact Ecophon with your questions or visit www.ecophon.co.uk

This publication shows products from Ecophon's product range and those of other suppliers. The specifications are intended to provide a general guide to which product will be most suitable for the preferences indicated. Technical data is based on results obtained under typical testing conditions or from 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.co.uk or contact your nearest Ecophon representative.

© Ecophon Group 2010

Idea and layout: Saint-Gobain Ecophon AB. Printer: Skånetryck. Cover: Faraday Fotografic. Technical photographs: Studiore. Technical illustrations: 3D Bild/Mats Paulsson. Illustrations: Belinski.



Photographer: Patrick Sabuin



Photographer: Studioe

Ecophon Hygiene™

the natural choice

Smooth, shiny, hard materials are the traditional choice in rooms where a high degree of cleanability is required. However, noise reduction requires soft materials. With Ecophon Hygiene, we have developed the optimal solution that integrates the requirements for cleanability with healthy acoustics.

Technical properties		Page
Acoustics		5
Cleanability		8
Accessibility		10
Influence of climate		11
Fire safety		13
Sustainability		14
Application areas		
The beverage industry		16
The food industry		18
The electronics industry		20
The pharmaceutical industry		22
Kitchen areas		24
Health care facilities		26
Leisure		28
Ecophon Hygiene™		30
Ecophon Hygiene systems		32

 Ceiling System

 Baffle System

 Wall System





A good acoustic environment

when hygiene requirements are strict

Choosing acoustic absorbers with the highest sound absorption class is a profitable investment.

Numerous studies show that the optimal acoustic environment improves both employees' work performance and general health.

All hard surfaces such as floors, walls and ceilings reflect sound, raising the general noise level and spreading disturbing noise throughout a space. Many factories, kitchens, indoor swimming pools and other large amenities have a noise level that is unhealthy and sometimes harmful.

So, can improving the acoustic environment increase productivity, lower sick leave levels and reduce the risk of workplace accidents?

Hearing in focus

According to the UK work environment organisation, The Health & Safety Executive (HSE), industrial hearing damage is the work-related injury that generates the most civil claims accounting for a staggering 75%. Exposure to high noise levels through the entire working day (equivalent noise level for eight hours) causes a high risk of hearing damage. This risk increases significantly at 80 dB(A), and hearing protection devices become compulsory at 85 dB(A). Noise levels are especially high in the beverage and food industries.

HSE's studies show that equivalent noise exposure levels can be as high as 95 dB(A) (at which the perceived noise level doubles), compared to the 85 dB(A) at which hearing protection devices become a requirement.

Even in facilities where the noise level is not directly physically harmful, disturbing noise causes discomfort and stress that impacts negatively on employees. Electronics, pharmaceutical facilities and hospitals are examples of such workplaces.

In many countries, employers are obliged to ensure that staff wear



© Skånemjölk



© IBL



hearing protection devices and prepare an action plan for reducing noise, if the equivalent noise exposure level is at least 85 dB(A).

The importance of sound absorption

Most industrial premises, kitchens and indoor swimming pools contain large rooms with high ceilings. Reverberation times in these spaces can be disturbingly long; sound bounces around the room, lingers as echo effects and raises the general noise level. Sound absorbers with the maximum sound absorption capacity are therefore recommended.

An acoustic ceiling, perhaps supplemented with wall absorbers, can reduce noise levels by up to 10 dB(A), halving the perceived noise level. Noises generated in the food and beverage industries are often high-frequency (1,000-3,000 Hz). Our hearing is most sensitive in this frequency range, and the acoustic systems in the Ecophon Hygiene family are particularly effective here.

If a wall to wall acoustic ceiling cannot be installed, for practical or technical reasons, there are other solutions in the form of wall absorbers or free-hanging sound absorption units such as ceiling-mounted baffles. All types of effective sound absorption systems installed in the room have beneficial effects.

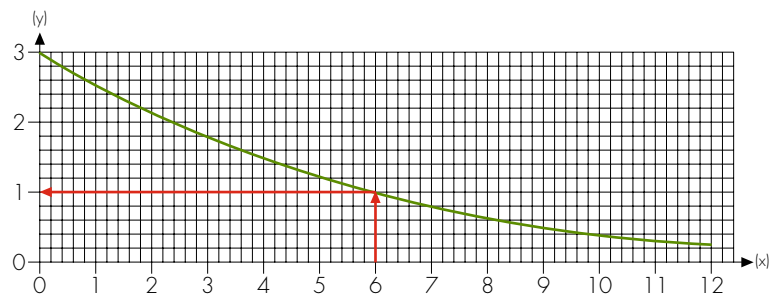
In all premises, improving the acoustic environment can lead to less sick leave, lower staff turnover and raised employee performance. Workplace safety also improves, as signals, irregular noises and warnings become much easier to hear and locate. Furthermore, eliminating the need for hearing protection facilitates communication, resulting in greater workplace enjoyment.

The best option is to plan good room acoustics when new premises are first designed. However, it is fully possible to install sound absorbing systems later on. In noisy premises, this may prove necessary and is always a wise decision.



Photographer: Inpress, Truls Busch-Christensen

Does more machinery mean an increase in sound level?



y = Sound level increase dB(A), to be added to the loudest of the two sound sources.
x = Difference in dB(A) between two different sound sources.

If new sound sources, for example machines, are installed in a room, the total sound level will increase as shown in the diagram.

Let us assume that a machine in the room generates 62 dB(A) and another machine is then installed that generates 68 dB(A). The difference, 6 dB(A) according to the diagram, means a total sound level increase of 1 dB(A). In summary: 62 dB(A) + 68 dB(A) => 69 dB(A).



Noise is unwanted sound. Sound becomes noise when it is perceived negatively, for example when the sound does not offer useful information or is generated by machinery and processes, especially ones that we are not personally in charge or in control of.

Sound pressure level, generally referred to as sound level, is measured in dB (decibels). The lowest perceivable sound level is 0 dB, and is known as the hearing threshold. The highest bearable sound level, known as the pain threshold, is around 120 dB. Sound levels can become harmful at 80 dB, depending on how long a person is subjected to the sound. dB(A) is used to denote the total sound level for all frequencies in a way that resembles the sensitivity of the human ear. The sound level in a room is, essentially, determined by the sound energy and the level of sound absorption.

Equivalent sound level is the average sound level that employees are subjected to in a room during, for example, a working day.

Perception of change in sound level

Changes in sound level	Subjective perception
1 dB	Reduction or increase is hardly perceivable
5 dB	Reduction or increase is clearly perceivable
10 dB	Reduction or increase results in halving or doubling of perceived sound level

Reverberation time is a measure of the time it takes for a generated sound to diminish by 60 dB in a room after the sound source is silenced. It is possible to measure how fast sound disappears and calculate the room's total sound absorption level. Reverberation time varies with sound frequency.

Reverberation time is determined by:

- The room's size and shape
- The number and position of sound-propagating objects such as machinery and other equipment
- The number and position of sound absorbers

Sound propagation means a sound's ability to spread in a room. Sound absorbers help limit sound propagation.

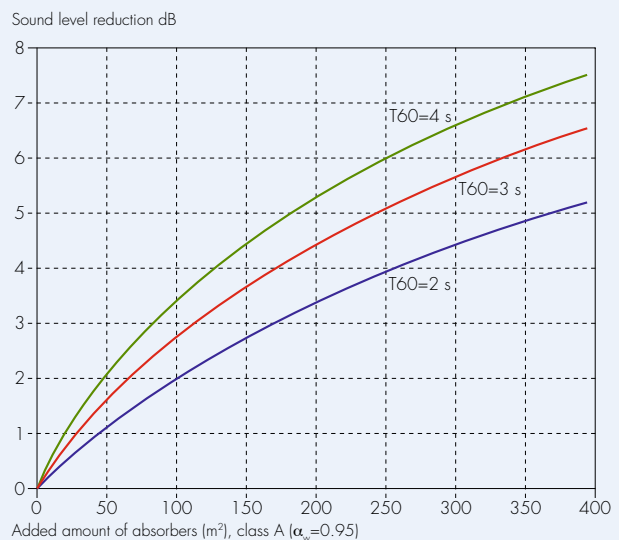
Speech perception means the ability to hear what is said in a room. Factors that affect speech perception include background noise level, reverberation time and room shape.

Sound absorbers have the ability to absorb sound in a room, thereby preventing it from being reflected into the space. Sound absorbers vary in quality. The sound absorbers in Ecophon's acoustic systems are made of glass wool, one of the most sound absorbant materials that exists. Sound absorbers lower sound level, shorten reverberation time and limit sound propagation.

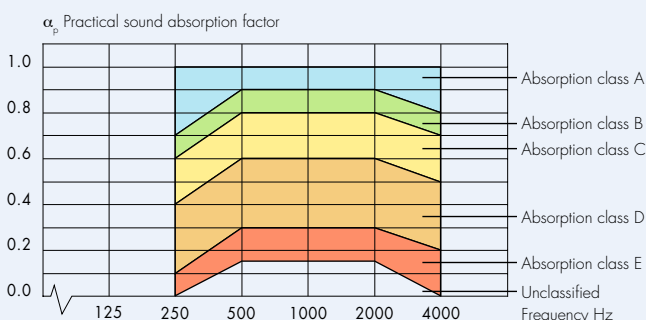
Sound Absorption Class. The effectiveness of sound absorbers and acoustic ceilings is directly related to their sound absorption class, according to international standards (EN ISO 11654). We recommend you choose an acoustic system in class A, the highest sound absorption class. These products shorten reverberation time, reduce sound level, improve speech perception and minimise sound propagation. Almost all systems in the Ecophon Hygiene family are sound cbsorption class A.

Sound level reduction in industrial premises

The diagram below indicates the sound level reduction in an industrial room with a volume of 2000m³ (Length x Width x Height = 25 metres x 10 metres x 8 metres) when a specific surface is covered with class A absorbers ($\alpha_w=0.95$). The sound level reduction depends on the amount of sound damping already present in the room. The diagram shows the sound level reduction that can be achieved if the damping in the room before adjusting the acoustics corresponds to the reverberation times (T60) 2 s, 3 s and 4 s, respectively. Wherever possible, the absorbers should be installed on the ceiling. If the added sound absorption system exceeds the area of the ceiling (250m²), part of the wall space can also be used.



To achieve the same sound level reduction with a class B absorber ($\alpha_w=0.85$), 15% more absorbent material must be installed. If a class C absorber ($\alpha_w=0.70$) is used, 40% more absorbent material must be installed than with a class A absorber.





Planning the interior

depending on cleanability and maintenance

Ecophon's Hygiene systems offer products that can be dusted, vacuum cleaned, wet wiped and washed at high or low pressure. To achieve an acoustic ceiling with long life and low maintenance cost, the exposed areas must be dirt- and dust-repellent and easy to keep clean. Ecophon Hygiene meets these criteria.

All the systems in the Ecophon Hygiene family can be cleaned by the most widely used cleaning methods. In addition, certain systems designed for specific environments withstand specialist cleaning.

Almost all Ecophon Hygiene systems are demountable, and some can be cleaned on both sides.



Photographer: Mikael Kristenson



Photographer: Göran Segeholm



Dry cleaning

Dusting or vacuum cleaning are recommended cleaning methods if the system is exposed to dust or other dry contaminants.



Wet wiping

Wet wiping can be carried out with a soft sponge or microfiber cloth and mild detergent or disinfectant. All Ecophon Hygiene systems can be wet wiped once a week.



High and Low pressure cleaning

Ecophon Hygiene with the Ecophon Connect C3 grid system is recommended for rooms that require regular cleaning or cleaning with foam and low/high-pressure cleaning. We also have grids to meet corrosion class C4 that withstand air with a high salt content and corrosive chemicals.



Steam cleaning

The surfaces of some Ecophon Hygiene systems can also be steam cleaned without detergent. The steam dissolves stains and kills micro-organisms.



Industrial detergents

Many of the industrial detergents on the market can be used to clean Ecophon Hygiene systems. These include both alkaline and acidic detergents and sometimes detergents in combination with disinfectants. Ethanol, isopropanol and sodium hypochlorite as well as gaseous hydrogen peroxide are common disinfecting chemicals that can be applied to Ecophon Hygiene systems.

Resistance to wet abrasion

Ecophon uses the Gardner method, described in ASTM D 2486 and the SS 184164 standard, for determine surfaces' resistance to wet abrasion, in order to guarantee the best possible washing resistance. The Ecophon Hygiene Advance™ system has been found to be unaffected by wet abrasion when tested to this method.



Photographer: Elisabeth Ohlson Wallin



Photographer: Sudlöve



Photographer: Patrick Solåun



Easy access

to the plenum when required

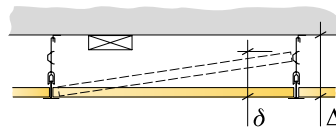
All systems in the Ecophon Hygiene range are designed so that the ceiling panels can be demounted for maintenance and when installations are added above the acoustic ceiling. The ceiling panels are fixed with clips to allow high pressure cleaning to take place and demo clips for areas where access is required.



The minimum overall depth of the system (o.d.s.) and minimum depth for demountability are indicated for each system described in this brochure. These measurements are also indicated as Δ (o.d.s.) and δ (minimum depth for demountability).

The minimum overall depth of the system is measured, while the minimum depth for demountability is empirically assessed. In practice, this means that the measurements may vary slightly depending on the skill and experience of the installer.

Vertical dimensions



Δ = Minimum overall depth of the system
 δ = Minimum depth for demountability

The overall depth of the system (Δ , o.d.s.) is the dimension from the underside of the structural soffit to the underside of the suspended acoustic ceiling. The minimum depth for demountability (δ) is the dimension required to fit and demount individual ceiling panels, measured from the underside of the acoustic ceiling.





Tough indoor climate

our systems meet the demands

All materials are affected by the ambient climate. Ecophon Hygiene is developed to withstand tough indoor climate factors such as humidity, heat, microbiological activity and aggressive environments.

Physical properties

The glass wool in Ecophon's sound absorbers is water-repellent. The material does not take in water by capillary action or absorb water from the ambient air. Any water that may penetrate the surface, for example during high pressure cleaning, dries out quickly due to the glass wool's structure. The surface of the acoustic panels in the Ecophon Hygiene Advance™ system is completely water proof. Ecophon Connect grid is available in corrosion classes C1, C3 and C4 according to the ISO 12944-2 standard.

Glass wool is one of the most moisture-resistant construction materials. This, combined with the durable surface material, means that the system can be installed in a building before the heating and ventilation systems.



Deflection of ceiling tiles deformed after absorbing moisture



Glass wool is one of the materials most resistant to moisture. Thus, glass wool ceiling tiles are dimensionally stable and stay flat even in environments with high or varying air humidity.

Air humidity and temperature

Relative air humidity varies according to season, temperature and climate. When the air humidity rises, as in catering kitchens, indoor swimming pools, shower areas or food production facilities, the air can become saturated and condensation can form. It is crucial to carefully evaluate and ensure that the right type of sound absorption system is installed in such environments.

Humidity tests and microbiological tests

Ecophon Hygiene acoustic ceiling systems are tested according to the methods and instructions in ISO 4611, and must withstand a permanent relative air humidity of up to 95% at 30°C without warping, sagging or delaminating. These limits may be temporarily exceeded without impairing the products or their function, for example when wet cleaning. Ecophon does not present higher values than 95% RH at 30°C due to technical and physical limitations of the test method. For



© Skånemejerier



Photographer: Elisabeth Ohlson Wallin

Corrosivity category	Examples of typical environments	
	Exterior	Interior
C1	-	Heated buildings with clean atmospheres, e.g. offices, shops, schools, hotels.
C2	Atmospheres with low level of pollution. Mostly rural areas.	Unheated buildings where condensation may occur, e.g. warehouses.
C3	Urban and industrial atmospheres, moderate sulfur dioxide pollution. Coastal areas with low salinity.	Production rooms with high humidity and some air pollution, e.g. food-processing plants, laundries, breweries, dairies.
C4	Industrial areas and coastal areas with moderate salinity.	Chemical plants, swimming pools, coastal ship- and boatyards.
C5-I (industrial)	Industrial areas with high humidity and aggressive atmosphere.	Buildings or areas with almost permanent condensation and with high pollution.
C5-M (marine)	Coastal and offshore areas with high salinity.	Buildings or areas with almost permanent condensation and with high pollution.

further information please go to www.ecophon.co.uk. To minimise the risk of corrosion, mould and/or changes in product appearance, the relative moisture level should only ever exceed 70-80% temporarily. The risk of mould and bacteria is an important consideration in environments with high relative humidity. Ecophon products themselves do not serve as a natural breeding medium for mould and bacteria. The risk of micro-organism growth can be significantly reduced by keeping the sound absorbers clean and observing critical moisture and temperature values.

Ecophon acoustic panels are tested for microbiological growth according to ASTM standard G 21-96 at the Swedish University of Agricultural Science (SLU). This standard grades the products in 6 classes (0-5). All tested Ecophon acoustic panels were in class 0, meaning that they are unaffected by microbiological growth. Ecophon Hygiene acoustic panels were not found to serve as a breeding medium for micro-organisms when tested by TNO Food and Nutrition Research in the Netherlands according to standard BS 3900.

Another TNO test showed that the foil used for Ecophon Hygiene Advance™ cannot be penetrated by water and steam.

Corrosive environments

The ISO 12944-2 standard defines and grades corrosive environments in five classes (C1-C5) depending on their exposure to corrosive factors. According to this standard, Ecophon Hygiene is suitable for use in environments up to class C4, for example in fish factories and dishwashing rooms, as well as in chemical factories and indoor swimming pools.

Clean room classification

There are certain environments where it is necessary to limit the quantity of airborne particles. This applies, for example, in the pharmaceutical, electronics and food industries and in certain hospital environments.

The international EN ISO 14644-1 standard is used for the classification of air cleanliness. The pharmaceutical industry is regulated by Good Manufacturing Practice (GMP) standards. Our acoustic panels are tested according to these classifications.



Fire safety

an obvious condition

A building fire can develop very quickly and have devastating consequences. When designing a building and selecting building materials, it is therefore of the utmost importance to take aspects of fire safety into account.

All systems in Ecophon's Hygiene systems have a high Euroclass rating (A2-s1,d0).

Fire safety demands for ceilings can vary dependant upon the type of room and building where they are to be installed. Detailed requirements can be found under national building regulations. Three general requirements can, however, be identified as crucial for ceilings in the early stages of fire.

- These may be achieved by installing a ceiling consisting of materials and surface linings compliant with at least Euroclass B-s,d0. The ceiling must have a negligible contribution to development of a fire and to smoke development.
- The ceiling must not break and collapse during the early stages of a fire, when it would obstruct evacuation and rescue operations. To pass this requirement the ceiling should be able to withstand a heat exposure of approx. 300°C. The heat radiation from a smoke gas layer with a temperature of 300°C corresponds approximately to what a fully equipped fire fighter can withstand.

Fire safety classification - Euroclass

Euroclass is a European classification system that defines how linings and construction materials react in connection with fire testing.

Altogether there are 39 classes divided into 7 main levels: A1, A2, B, C, D, E and F, with A1 being the highest level and F denoting unclassifiable products and materials.

Most of the main classes include an additional classification for smoke production and the occurrence of flaming droplets and particles.

- The classes for smoke formation are s1, s2 and s3, with s1 being the highest level.
- The classes for flaming droplets and particles are d0, d1 and d2, with d0 being the highest level.

Ecophon Hygiene is rated non-combustible

All systems in the Ecophon Hygiene system are rated A2-s,d0.

Materials and products with A1/A2-s,d0 rating are often classified as non-combustible.



Photographer: Juha Nyberg

Sustainability

today and tomorrow

An improved acoustic and lighting environment with emphasis on enjoyment, efficiency and health – these working environment values impact positively on indoor spaces where people spend time, socialise and work. Ecophon manufactures sound-absorbing systems and products with this objective in focus.

Ecophon Hygiene systems meet the environmental requirements of environmental labelling bodies and organisations in the fields of construction research and health. We aim to provide documentation proving that our systems are safe for both the internal and external environment.

- *The Swedish Asthma and Allergy Association* has examined Ecophon Hygiene for substances that may contribute to allergic reactions and other irritations. Following these examinations, all Ecophon Hygiene systems were recommended by the Swedish Asthma and Allergy Association.
- Ecophon Hygiene is certified and meets the highest requirements for *the Indoor Climate label* by the Danish Technological Institute (DTI). DTI measures substances in construction materials that have been found to be potential allergens or irritants, and measures the length of time it takes after installation for these substances to subside to an acceptable level. In addition, a subjective smell test is performed to ascertain the presence of any remaining smells deriving from emissions.
- The systems meet the emission requirements of RTS, Finland's leading information centre for the construction sector. Products labelled *M1* (signifying the best emission class) have the lowest emission values for many substances hazardous to health.
- Ecophon's sound absorbers are subjected to inspection by the Swedish Testing and Research Institute (SP) so that their sound absorption capacity can be *P-labelled* so qualifying acoustic tests. A P-labelled sound absorber meets the criteria of the Swedish Standards Institute (SIS).
- All Ecophon Hygiene systems with a painted surface display *the Nordic Swan Ecolabel*, and thereby meet the criteria and requirements of the Nordic Ecolabelling Board (NMN) regarding the entire product lifecycle, from raw material to recycling. The requirements include pollution and hazardous emissions, waste management, energy and resource consumption.



The Akutex™ label always guarantees that the painted product carrying it has a superior surface. Our research and development always focuses on visual aspects, acoustic properties, working environment, architectural trends and environmental care. This ensures that Akutex is always one step ahead.



Ecophon Hygiene fulfils the requirements of several labelling organisations. Some of these can be seen above.

- Glass wool consists almost entirely of glass. Over 70% of the base material in Ecophon's sound absorbers is made of recycled household glass and recycled glass wool. The remaining percentage consists of newly produced glass from natural raw materials such as sand. The systems' grids are primarily made of galvanised steel consisting partly of recycled steel, which in turn is recyclable.
- To show that Ecophon meets applied EU standards, Ecophon Hygiene is *CE-marked*, which facilitates comparison between different makes and types of sound absorber. CE-marking covers criteria such as sound absorption, fire safety and certain emissions.
- Unique patented coupling design in the Connect™ grid range enables safe connection between profiles and easy demounting.

1. Short projection of the guide tongues

- Does not disturb the next tile
- Provides a more shock-absorbent coupling.

2. Locking tongue with latch

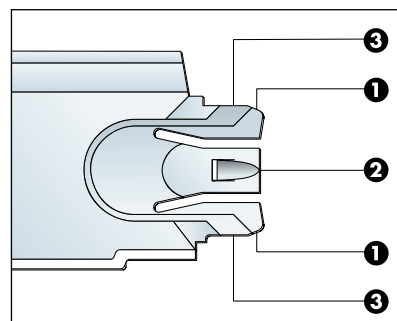
- Gives distinct and safe mounting.
- Ensures demountability without tools
- Makes a "click" when the profile is in position.
- Prevents the cross tee profile from sliding out of the main profile even if only one side is latched.

3. Design of the guide tongues

- Protects the tongues against shocks and deformation.
- Produces a more shock-absorbent coupling.
- Facilitates mechanical connection of the main and cross profiles.



Ecophon Hygiene contains more than 70% recycled household glass, and the grid is recyclable and made out of recycled steel.



Connect™ Cross tee

1. Short projection of the guide tongues
2. Locking tongue with latch
3. Design of the guide tongues



The beverage industry



© Skånemejerier

Clattering conveyor belts, glass containers and other hard packaging generates high, irritating noise levels that constitute a health and safety hazard in the beverage industry. Over the years, high cleanability requirements have made hard packaging the traditional choice. However, the noise they generate can become almost unbearable unless special measures are taken.

Ecophon's room acoustic solutions create a pleasant acoustic environment for all employees working in a high pace production environment where alertness and concentration are required.

Bottling lines, filling lines and conveyor belts are part of the noisy mechanical processes in the beverage industry. Combined with bare, hard surfaces and large open spaces, these processes generate high noise levels and echo effects that spread through the entire room.

An improved acoustic environment contributes to greater staff well-being and better communication, minimising unnecessary hearing damage and increasing safety. An important aim is to eliminate the need for hearing protection devices. This improves work efficiency, thereby raising profits. These days, it is a myth that hard surfaces are



Photographer: Faraday Fotographic



© Shutterstock Semen Lixodeev

Photographer: Faraday Fotographic

by definition easier to keep clean than other surfaces. The systems in the Ecophon Hygiene family include acoustic ceilings and sound absorbers with stain protected and grease resistant surfaces that are easy

to clean. This means it is no longer necessary to sacrifice indoor acoustics to meet hygiene requirements.

Area	System performance	Hygiene System	Page
Wet area	Dirt, grease and chemical resistant, daily high pressure washing, constant high humidity, stainless steel*	Advance A C4	32
	Dirt, grease and chemical resistant, daily high pressure washing	Advance A C3	34
	Dirt, grease and chemical resistant, daily high pressure washing	Advance Baffle C3	36
	Dirt, grease and chemical resistant, daily high pressure washing, impact resistant	Advance Protection C3	38
	Dirt, grease and chemical resistant, daily high pressure washing	Advance Wall C3	40
	Stain protected, high pressure washing 2/year	Foodtec A C3	42
	Stain protected, high pressure washing 2/year	Foodtec Baffle C3	44
	Stain protected, high pressure washing 2/year, impact resistant	Foodtec Protection C3	46
	Stain protected, high pressure washing 2/year	Foodtec Wall C3	48
	Stain protected, high pressure washing 2/year	Foodtec A C3	42
Dry area	Stain protected, high pressure washing 2/year	Foodtec A C3	42

* acid-proof high performance austenitic stainless steel



The food industry



Photographer: H.G.Esch Photography

The acoustic environment is often top of the list when employees are asked which working environmental factors they find most disturbing. The food industry is no exception. Far from it: in this industry, many people work in a small space and loud noise spreads through the whole room. Machinery operates constantly throughout the working day, and short breaks provide inadequate opportunity to recover from the high sound levels.

This problem can be solved. Ecophon Hygiene is a family of acoustic ceiling systems and sound absorbers that meet all environmental requirements of the food industry.

Production lines for preparation, filling, packing, freezing and preservation of food generate high noise levels in rooms where hard surface materials reflect and spread sound. To provide viable conditions for a conversation, the room must have a sufficient amount of sound-absorbing material, usually in the form of an acoustic ceiling, sometimes supplemented with acoustic baffles and wall absorbers or a combination of these. Noise reduction improves safety by making it easier to hear warnings and safety instructions. This reduces the risk of people being injured or sensitive equipment being damaged.



Photographer: Studio

Photographer: Patrick Salau

Photographer: H.G. Esch Photography

An optimal acoustic environment solves problems in most areas: safety is improved, staff feel and perform better and productivity increases. A relatively modest investment in improving the acoustic environment pays many dividends in the form of healthier, more efficient employees.

Ecophon Hygiene acoustic systems significantly

improve the acoustic environment. In addition, they satisfy hygiene requirements and withstand cleaning with strong detergents and the aggressive disinfectants required to prevent bacterial infection. Some systems are also dirt resistant and all systems discourage the growth of micro organisms.

Area	System performance	Hygiene System	Page
Wet area	Dirt, grease and chemical resistant, daily high-pressure washing, constant high humidity, stainless steel*	Advance A C4	32
	Dirt, grease and chemical resistant, daily high-pressure washing	Advance A C3	34
	Dirt, grease and chemical resistant, daily high-pressure washing	Advance Baffle C3	36
	Dirt, grease and chemical resistant, daily high-pressure washing, impact resistant	Advance Protection C3	38
	Dirt, grease and chemical resistant, daily high-pressure washing	Advance Wall C3	40
	Stain protected, high pressure washing 2/year	Foodtec A C3	42
	Stain protected, high pressure washing 2/year	Foodtec Baffle C3	44
	Stain protected, high pressure washing 2/year, impact resistant	Foodtec Protection C3	46
	Stain protected, high pressure washing 2/year	Foodtec Wall C3	48
	Stain protected, weekly wet wiping	Foodtec A C3	42

* acid-proof high performance austenitic stainless steel



The electronics industry



© IBL

Electronic production requires advanced technology and high levels of concentration and alertness in staff. An indoor environment with optimal acoustic, lighting and air conditions is a fundamental prerequisite for this. Studies have shown that the more cognitively demanding the work, the higher the risk of making mistakes in a noisy environment.

Installing Ecophon Hygiene products in the ceiling creates an acoustic system with the highest possible class of sound absorption meeting the requirements for the electronics industry.

Stress and raised blood pressure, difficulty conversing, fatigue and increased risk of mistakes are some of the consequences of a poor acoustic environment. Continuous background humming and irritating pneumatic hissing negatively affects employees, reducing concentration and lowering productivity. In the electronics industry, with its high focus on processes and precision, room acoustics have a decisive impact on efficiency and profitability.



Photographer: Marcin Zeglinski

An efficient acoustic ceiling dampens excessive noise levels and limits sound propagation, which benefits all employees.

The electronics industry must meet requirements for clean room classification in various contexts, and must follow the ISO 14644-1 standard with regard to air particle levels. To facilitate cleaning, walls, floors and ceilings have hard surfaces, which directly counteracts a good acoustic environment.

Installing an Ecophon Hygiene system in the ceiling eliminates the need to compromise on room acoustics. The Ecophon Hygiene family has a suitable system for clean room classified premises with optimum sound absorption (class A).

Classification	System performance	Hygiene System	Page
ISO class 1-3	No need for acoustic treatment, limited human presence	-	-
ISO class 4-9	Chemical resistant, enclosed tile, daily wet cleaning	Advance A C3	34
ISO class 5-9	Particle repellent, high humidity, weekly wet wiping	Protec A C3	50
ISO class 5-9	Particle repellent, weekly wet wiping	Protec A C1	52
ISO class 5-9	Particle repellent, weekly wet wiping	Labotec Ds C1 *	54

* only vertical joints



The pharmaceutical industry



Photographer: Mikael Kristenson

The pharmaceutical industry has one of the most strictly controlled production environments. Manufacturers must be able to prove that they satisfy government requirements, with regard to particle emissions and hygiene. Today there are sound absorbers that comply with established standards, making a noisy production environment a thing of the past.

The acoustic systems in the Ecophon Hygiene family meet all the pharmaceutical industry requirements for indoor environments.

Traditional hard indoor surfaces can be eliminated with an Ecophon Hygiene sound-absorbing acoustic ceiling, which has all the necessary functional properties. The systems fulfil the most stringent requirements on emissions, and the tiles discourage micro organism growth. Ecophon Hygiene acoustic systems comply with Good



© Shutterstock Alexander Raths

Manufacturing Practice (GMP) standards, class A (the highest class).

Ecophon Hygiene Labotec™ is available for laboratory environments. This system provides a smooth ceiling with no visible grid system where particles can and may collect.

Optimal room acoustics increase workplace enjoyment and improve employees' work quality, efficiency and well-being. A healthy acoustic environment is not impossible.

Room type/Classification	System performance	Hygiene System	Page
GMP class A to D	Chemical resistant, enclosed tile, daily wet cleaning/disinfecting	Advance A C3	34
GMP class A to D	Particle repellent, disinfecting, weekly wet wiping	Labotec Ds C1 *	54
GMP class A to D	Particle repellent, disinfecting, high humidity, weekly wet wiping	Protec A C3	50
Packaging, storage	Particle repellent, disinfecting, weekly wet wiping	Protec A C1	52
Laboratory, control	Particle repellent, disinfecting, weekly wet wiping	Labotec Ds C1 *	54

* only vertical joints



Kitchen areas



In catering and restaurant kitchens, rooms used for dishwashing, preparation and food production operations are among the noisiest acoustic environments. These facilities also have high hygiene requirements. Metal fixtures and fittings, stone floors and bare wall and ceiling surfaces reflect sound. This leads to increased stress levels among the employees, who also work at a fast pace. It is difficult to have conversations, resulting in a high risk of misunderstandings and mistakes.

Ecophon's acoustic products and systems improve the acoustic environment in catering and restaurant kitchens without compromising the requirements for cleanability.

Ecophon Hygiene reduces noise levels and limits sound propagation in workplaces with a high level of noise, thereby significantly improving the working environment. Restaurant and school kitchens are often located next to the dining area, and noise from the kitchen can disturb the diners. Installation of effective sound absorbers significantly reduces sound propagation into adjacent spaces.

The Ecophon Hygiene family has acoustic systems for ceilings and walls for various kitchen environments, where the products



Photographer: Åke E:son Lindman

and systems must withstand exposure to grease and cleaning products in addition to humid and corrosive environments. Both the Connect grid and the Hygiene sound absorbers meet these requirements, and different systems can be chosen depending on how aggressive the environment is or the type of cleaning methods required.

Hygiene's smooth, hard-wearing surface makes cleaning easy and time saving. If the air has a high grease content, we recommend Ecophon Hygiene Advance™. For kitchens with high air humidity, we have acoustic ceilings with grids in corrosion class C4.

Area	System performance	Hygiene System	Page
Cooking area	Dirt, grease and chemical resistant, daily high-pressure washing	Advance A C3 	34
Cooking area	Dirt, grease and chemical resistant, daily high-pressure washing, impact resistant	Advance Protection C3 	38
Cooking area	Dirt, grease and chemical resistant, daily high-pressure washing	Advance Wall C3 	40
Preperation, storage, serving area	Stain protected, high pressure washing 2/year	Foodtec A C3 	42
Preperation, storage, serving area	Stain protected, high pressure washing 2/year, impact resistant	Foodtec Protection C3 	46
Preperation, storage, serving area	Stain protected, high pressure washing 2/year	Foodtec Wall C3 	48
Dishwashing area	Dirt, grease and chemical resistant, daily high pressure washing, constant high humidity, stainless steel*	Advance A C4 	32

* acid-proof high performance austenitic stainless steel



Health care facilities



Photographer: Patrick Salaün

In hospitals and other health care premises, a well-planned acoustic environment is particularly important since it improves staff and patient well-being. It reduces stress and improves sleep for patients. An optimal acoustic environment improves feelings of integrity and safety. Studies have shown that health care is more effective when patients feel safe and comfortable, which in turn reduces health care costs.

The Ecophon Hygiene family includes systems that meet hygiene requirements in all relevant room types.

Feeling calm and secure while hospitalized is vital in minimising patient stress. An optimal acoustic environment speeds up recovery, improves sleep, lowers blood pressure and reduces readmission rates. Staff also feel better and concentrate more efficiently on their work, with positive effects on both quality and economy.

Unfortunately, noise levels in hospitals and other health care premises have become progressively higher over the years. Modern technical equipment and constant activity generate disturbing noise, this is further aggravated by the sound-reflecting, hard surface materials normally used for hygiene purposes.



Photographer: Patrick Salaün

Photographer: Patrick Salaün

Photographer: Patrick Salaün

Ecophon Hygiene system's surfaces can be cleaned with the most widely used detergents and disinfectants. Moreover, the material does not act as a breeding ground for bacteria. Regardless of the room type

and activity, Ecophon offers systems that meet stringent demands from a hygienic as well as an acoustic perspective.

Room type	System performance	Hygiene System	Page
Operating theatre	Particle repellent, disinfecting, weekly wet wiping/ ISO class 5*	Protec A C3	50
Laboratory	Particle repellent, disinfecting, weekly wet wiping, ISO class 5*	Labotec Ds C1**	54
Treatment room	Disinfecting, weekly wet wiping,	Meditec A/E C1	60, 62
Ward room	Disinfecting, weekly wet wiping,	Meditec A/E C1	60, 62
Corridor	Disinfecting, weekly wet wiping,	Meditec A/E C1	60, 62
Hygiene room (sterilisation)	Dirt and chemical resistant, daily wet cleaning/disinfecting, ISO class 4*	Advance A C3	34
Recovery room	Disinfecting, weekly wet wiping,	Meditec A/E C1	60, 62
Intensive care	Particle repellent, disinfecting, weekly wet wiping, ISO class 5*	Protec A C3	50

* according to ISO 14644-1 ** only vertical joints



Leisure



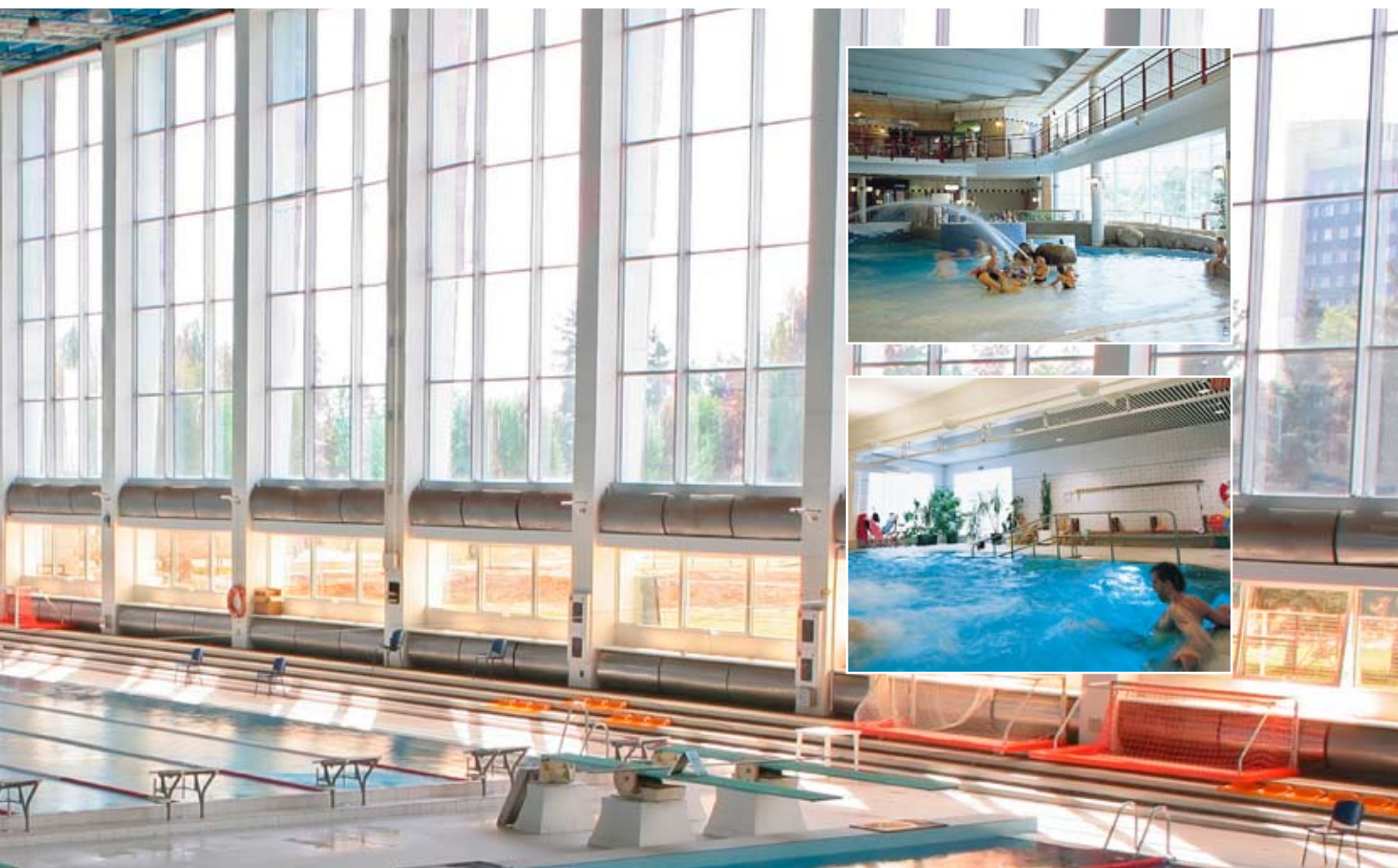
Photographer: Åke Eson Lindman

In indoor swimming complexes, noise levels are almost always high due to the lively nature of the activities in and around the pools. Sound reverberates between the hard surfaces on the ceilings, walls and floors, and spreads across the surface of the water.

Ecophon's acoustic products and systems reduce the risk of hearing damage among employees, improves safety and facilitates communication within the pool area. The Ecophon Hygiene family has systems that withstand humid environments.

In certain indoor swimming pools, staff would probably benefit from hearing protection to prevent hearing damage and tinnitus. Sound absorbers of the highest sound absorption class lower the sound level and limit sound propagation. This makes it easier to hear cries for help, locate the sound, and make the environment more comfortable.

A wall to wall acoustic ceiling, perhaps supplemented with Ecophon Wall Panels, reduces the risk of hearing damage, creates a harmonious working environment and facilitates communication, thereby also improving safety.



© Shutterstock YegorIus

Communal showers also tend to be extremely noisy. Sound absorbers can help by lowering the noise level and creating a calmer environment.

Many indoor swimming pools and communal shower areas have corrosive environments, and choosing the right solution is crucial to maximise a material's lifespan. In certain indoor swimming pools,

the construction materials are required to comply to corrosion class C4. The Ecophon Hygiene system family includes acoustic ceilings especially designed for indoor swimming pools with high air humidity, or where surfaces are frequently exposed to water splashes.

Area	System performance	Hygiene System	Page
Water park/ Swimming hall	Highly corrosive environment, constant high humidity, stainless steel*	Performance A C4	56
Water park/ Swimming hall	Corrosive environment, constant high humidity	Performance A C3**	58
Shower	Weekly wet wiping, frequent high humidity	Advance A C3	34
Shower	Weekly wet wiping, constant high humidity	Performance A C3	58
Toilets	Weekly wet wiping	Performance A C1	60

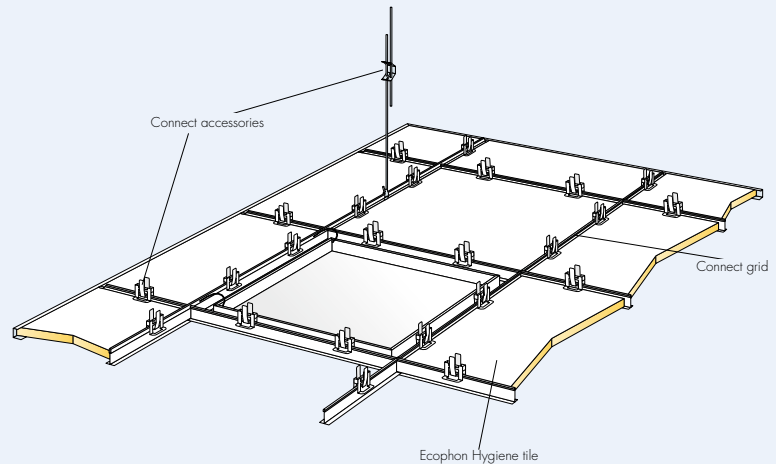
* acid-proof high performance austenitic stainless steel ** under favorable and controlled conditions

Ecophon Hygiene™

system design

Ecophon Hygiene systems feature various combinations of absorbers, which have a core of high density glass wool. The supporting structure consists of a corrosion protected grid and specifically designed accessories.

The systems are developed to deal with tough factors in environments which are known to have an impact on a ceiling's performance and lifespan



6 Absorbers,

that meet various tough demands, with a variety of surfaces, edges and installation methods.



Ecophon Hygiene Advance™



Ecophon Hygiene Foodtec™



Ecophon Hygiene Protec™



Ecophon Hygiene Labotec™



Ecophon Hygiene Performance™



Ecophon Hygiene Meditec™

3 Different grids,

based on suitability to the type of corrosive environment they will be installed in.



Connect™ T24 Main runner C4



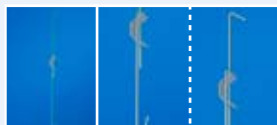
Connect™ T24 Main runner C3



Connect™ T24 Main runner C1

22 Different accessories,

These ensure the integrity of the system in the form of ease of installation, cleanability and corrosion class.



Connect™ Adjustable hanger C3



Connect™ Hygiene clip 20



Connect™ Wall fixing C3



Connect™ Anchor Screw C4



Photographie: Faraday, Fotographic

Makes the difference

Ecophon Hygiene™

Hygiene system range		Page
Hygiene Advance A C4		32
Hygiene Advance A C3		34
Hygiene Advance Baffle C3		36
Hygiene Advance Protection C3		38
Hygiene Advance Wall C3		40
Hygiene Foodtec A C3		42
Hygiene Foodtec Baffle C3		44
Hygiene Foodtec Protection C3		46
Hygiene Foodtec Wall C3		48
Hygiene Protec A C3		50
Hygiene Protec A C1		52
Hygiene Labotec Ds C1		54
Hygiene Performance A C4		56
Hygiene Performance A C3		58
Hygiene Performance A C1		60
Hygiene Meditec A C1		62
Hygiene Meditec E C1		64
Hygiene Lavanda T5 C3 (integrated luminaire for ceiling systems)		66



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, healthcare and industrial manufacturing premises. Ecophon is part of the Saint-Gobain Group and has sales units and distributors in many countries.

Ecophon's efforts are guided by a vision of earning global leadership in acoustic ceiling and wall absorber systems by providing superior end user value. 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.co.uk

