

# Noise reduction

**in the pharmaceutical industry**



**Ecophon**<sup>®</sup>

A SOUND EFFECT ON PEOPLE



An acoustic wall to wall ceiling decreases the sound spreading from production equipment, creating better working conditions at adjacent stations.

### **Room Acoustic Comfort™ in industrial premises**

Room Acoustic Comfort™ is Ecophon's concept for room acoustic design, this puts emphasis on people, their activities and the room. The acoustic descriptors defined are reverberation, speech clarity, auditory strength and spatial decay. The aim is to achieve the optimum value for the descriptors that are relevant to the room's function. According to Room Acoustic Comfort™, auditory strength and reverberation should be the focus when designing industrial premises, this means reducing the auditory strength and limiting reverberation in a room. Production equipment generates a large amount of direct sound, and it is important to prevent this sound from being amplified by the premises themselves. This is achieved, by installing, among other things, class A sound absorbers in ceilings, on walls or as suspended baffles.

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.com](http://www.ecophon.com) or contact your nearest Ecophon representative. © Ecophon Group 2010. Idea and layout: Navigator. Printer: Skånetryck. Cover: Martin Magtorn. Technical photographs: Studiore.

# Sound is an important part of the working environment



Less noise offers benefits in terms of better teamwork and easier communication.

Sound affects us in many ways. Disturbing noise causes fatigue, stress and communication problems. This impairs both productivity and safety, which in turn reduces profitability and can violate work environment regulations. Sick leave and high staff turnover also impact negatively on profitability. There is much to be gained from achieving an optimal acoustic environment.

## **Dampen disturbing noise and background noise**

Certain mechanical processes in the pharmaceutical industry generate loud and disturbing noise. Eliminating as much of this noise as possible has many benefits. Above all, it creates a calmer, more pleasant atmosphere, making employees more alert and focused and providing better conditions. It also facilitates communication, which not only raises efficiency but also improves safety. Minimising the need for hearing protection also offers benefits in terms of teamwork and communication.

## **How can the acoustic environment be improved?**

- Define a noise policy to raise awareness about the acoustic environment
- Make demands on suppliers of machinery and other equipment
- If possible, gather together noise sources and create quiet areas in a room
- Install sound absorbers in ceilings, on walls or as suspended baffles

## **For the eye, the ear and the mind**

Ecophon specialises in developing sound-absorbing solutions for all environments where people work and communicate. Long experience combined with innovative thinking has made us a leading player in the industry. Our mission is to contribute to a good working environment for the eye, the ear and the mind.

# Controlled environment

## with strict hygiene requirements

It is well known that pharmaceutical production facilities contain equipment and processes that generate disturbing noise. In addition, the surfaces are hard and smooth, so sound bounces off of them and spreads around the room. Taking measures to improve the acoustic environment offers many benefits; however, any sound-absorbing systems installed must not impact negatively on hygiene. The various Ecophon Hygiene Systems offer solutions for this particular combination of needs.

### The importance of a controlled environment

In the pharmaceutical industry, certain critical aspects are absolutely vital to a company's survival. The environment must be controlled to ensure high quality throughout the production chain. Bacterial growth and particle emissions can cause major problems and downtime. The consequences can be disastrous in both practical and economic terms.

### Pressurised rooms

Many rooms in the pharmaceutical industry are pressurised. Clean pressurised air is released into the room through an HEPA or ULPA filter. This creates overpressure, which makes it possible to control the environment. Ecophon Hygiene Systema are suitable as a ceiling when there is equal pressure below and above the ceiling.

### Customer requirements, standards and regulations

Pharmaceutical manufacturers must be able to prove that they satisfy customer and government hygiene requirements. GMP (Good Manufacturing Practice) is used as a standard. GMP includes minimum requirements for equipment, knowledge, quality and procedures relating to production, for example in the form of an HACCP plan. GMP is divided into four classes: A, B, C and D, with A being the highest class. The ISO 14644-1 standard is used for the classification of air cleanliness.

### Products must withstand aggressive factors

In order for a hygiene-critical production environment to meet prevailing requirements, all products and systems installed there must be designed to adequately withstand various critical factors such as:

- Temperature
- Relative air humidity
- Chemical contaminants (e.g. alcohols, chlorides)
- Physical contaminants (e.g. dust)
- Biological contaminants (e.g. micro-organisms)

In addition, it is imperative that the environment can be cleaned regularly, easily and efficiently.

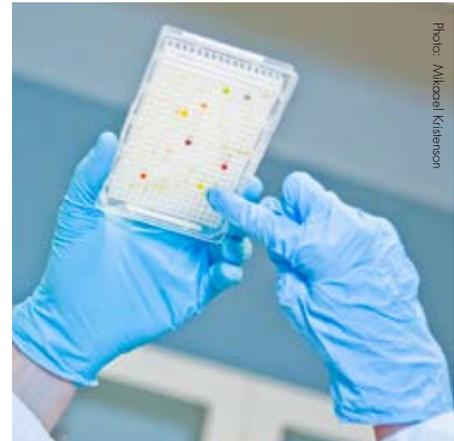


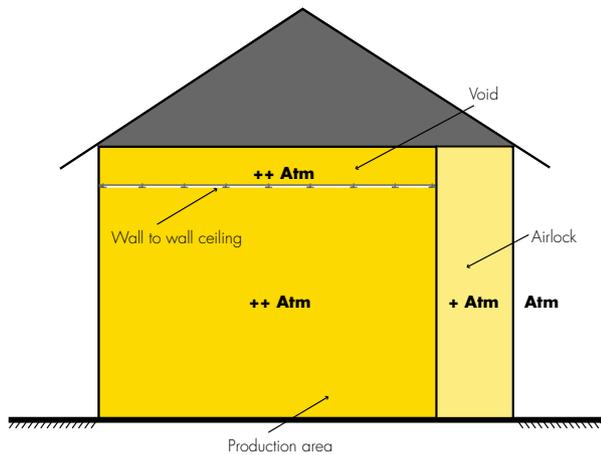
Photo: Mikael Kristensen



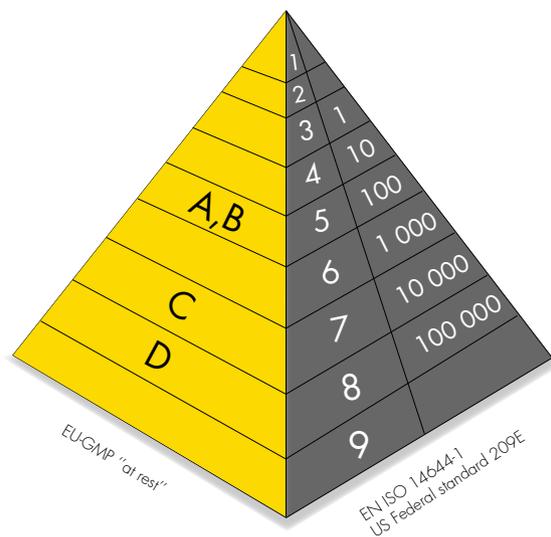
Photo: Martin Mogensen



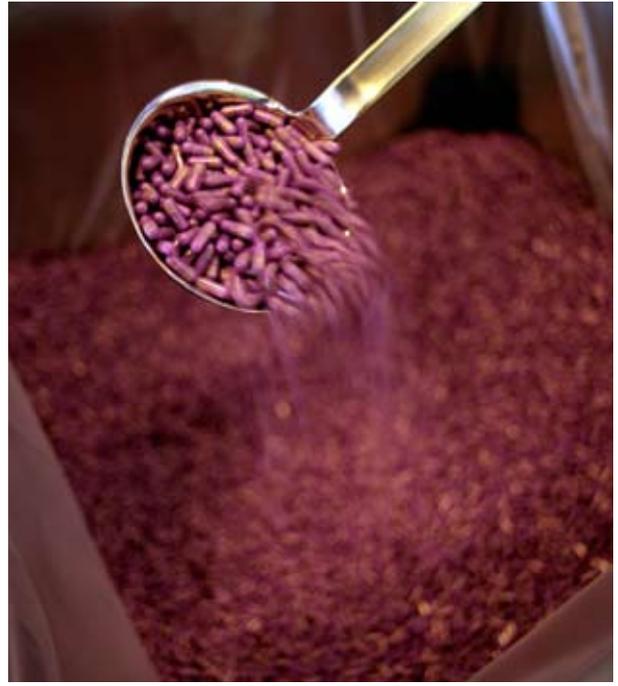
Less noise creates a calm, pleasant atmosphere, making employees more alert and focused.



Ecophon Hygiene System is suitable as a sound-absorbing ceiling in constructions where there is equal pressure below and above the ceiling.  
(Atm: Atmospheric pressure)



The ISO 14644-1 standard is used for the classification of air cleanliness. This is the official standard, but the US Federal standard 209E is also widely spread and used.  
(GMP "at rest" is valid when the room is not in use.)



Different rooms in a facility have different hygiene requirements.



Photo: Elisabeth Olsson Malin

All products and systems installed in pharmaceutical industry must comply with GMP classifications.

# The most proven systems

in the market

## Product facts

Inert glass wool is the raw material used in our sound absorbers, and is predominantly made of recycled glass. Microbiological tests of the finished product, performed by TNO Nutrition and Food Research, prove that the product is not a breeding ground for micro-organisms.

Our products have the following labels/classifications:

- Indoor Climate Label
- Emission class M1 for building materials
- Recommended by the Swedish Asthma and Allergy Association
- Most of our products are marked with the Nordic Swan Ecolabel
- Fire class A2-s1,d0 according to EN 13501-1
- Sound Absorption class according to standard SS-EN ISO 11654, P-labelled to guarantee the classification

Ecophon has 30 years experience of developing acoustic solutions that meet stringent requirements for cleanliness.

## Multi-step evaluation process

Different rooms in a pharmaceutical manufacturing facility have different hygiene requirements. First of all, the conditions that characterise each room must be evaluated. These conditions are then matched to specific needs, based on internal objectives, external requirements, standards and regulations.

The following conditions must be taken into account in the evaluation:

- Temperature
- Cleaning Agents, types of detergents and/or disinfectants and their frequency of use
- Overpressure, underpressure or normal pressure
- Permitted materials

## Different cleaning methods

The cleaning of the premises is central to the hygiene process. The whole room must withstand the cleaning methods chosen to ensure the level of hygiene required by internal requirements, customers, standards and regulations.

Widely used methods:

- Dry cleaning  
Particles are removed with a microfibre cloth or a vacuum cleaner.
- Disinfection  
Micro organisms are killed by spraying the surfaces with disinfectant.
- Gas or steam  
Micro organisms are killed with gas (e.g. hydrogen peroxide) or steam, or a mixture of both.
- Wet cleaning  
Particles and micro organisms are removed with a moist mop or a microfibre cloth. often used in association with detergents.

All products and systems installed in the pharmaceutical industry must withstand these established cleaning methods. For this reason, Ecophon uses commonly used detergents, disinfectants and cleaning methods in development and testing.

## Systems for all rooms

Hygiene requirements in production facilities vary depending on the sensitivity of the operations. All hygiene requirements must be satisfied in order for a sound-absorbing system to produce optimum results, including from a cleanability perspective. Ecophon has developed sound absorbing systems that meet prevailing hygiene requirements for most types of room in the pharmaceutical industry.



Recommended  
by the  
Swedish Asthma  
and Allergy Association

# Ecophon Hygiene System

## for the pharmaceutical industry

Back in the late 1980s, we delivered our first sound absorbers to the Swedish pharmaceutical industry, for example to the National Corporation of Swedish Pharmacies (Apoteksbolaget). We have evolved our systems since then, and today offer several Hygiene systems depending on the application. We have gathered these ceiling systems under Ecophon Hygiene Protec™ and Ecophon Hygiene Labotec™, of which the later has no visible grid where particles may collect. For constantly humid environments or areas with high demands on low particle emissions we recommend Ecophon Hygiene Advance™.

### Ecophon Hygiene Advance™ A C3

Ceilings for environments with a high demand for easy cleaning, or when there are high demands on low particle emissions. The system is compliant with GMP class A and ISO class 3 according to ISO 14644-1.

#### System description:

- Hygiene Advance A tiles are encapsulated in a smooth high-performance film that is dirt, grease and chemical resistant, and impervious to particles and water.
- Exposed Connect T24 C3 lacquered galvanised steel grid, corrosion class C3 (EN ISO 12944-2).
- Hygiene Clips fix the tiles to the grid

#### Cleaning:

Withstands daily cleaning, with commonly used detergents and disinfectants.



Hygiene Advance A C3 section with Connect Hygiene clip 20

### Ecophon Hygiene Labotec™ Ds C1

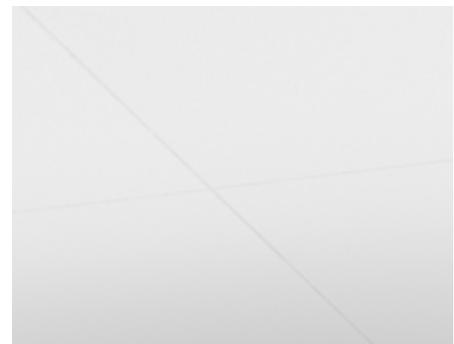
Ceilings for laboratory environments. The system is compliant with GMP class A and ISO class 5 according to ISO 14644-1.

#### System description:

- Hygiene Labotec™ Ds tile, with the painted Akutex™ HP surface to prevent adhesion of particles. Painted back and edges.
- Concealed Connect Ds grid of galvanised steel, corrosion class C1 (EN ISO 12944-2).
- Hold down clips fix the tiles to the grid and allow them to be demounted from below.

#### Cleaning:

Withstands wet wiping with commonly used detergents and disinfectants.



Hygiene Labotec Ds C1 system



Hygiene Labotec Ds C1 section with Connect Hold down clip Ds



Ceiling System



Baffle System



Wall System



Hygiene Protec A tile

### Ecophon Hygiene Protec™ A C3



Ceilings for rooms with high humidity that are frequently cleaned with water or disinfectant. The system is compliant with GMP class A and ISO class 5 according to ISO 14644-1.

#### System description:

- Hygiene Protec™ A tile, with the painted Akutex™ HP surface to prevent adhesion of particles. Painted back and edges.
- Exposed Connect T24 C3 lacquered galvanised steel grid, corrosion class C3 (EN ISO 12944-2).
- Hygiene Clips fix the tiles to the grid.

#### Cleaning:

Withstands frequent cleaning with water and commonly used detergents and disinfectants.



Hygiene Protec A C3 section with Connect Hygiene clip 20

### Ecophon Hygiene Protec™ A C1



Ceilings for rooms that are occasionally cleaned or disinfected. The system is compliant with GMP class A and ISO class 5 according to ISO 14644-1.

#### System description:

- Hygiene Protec™ A tile, with the painted Akutex™ HP surface to prevent adhesion of particles. Painted back and edges.
- Exposed Connect T24 grid, corrosion class C1 (EN ISO 12944-2).
- Hygiene Clips fix the tiles to the grid.

#### Cleaning:

Withstands wet wiping with commonly used detergents and disinfectants.



Hygiene Protec A C1 system

### Lighting

Ecophon Hygiene Lavanda™ T5 C3 is a flush-mounted luminaire specifically developed for rooms with strict hygiene requirements. It has IP65 classification (dust- and water-proof). The luminaire is easy to mount and withstands high-pressure cleaning. It is designed to fit edge A ceiling systems such as Advance A and Foodtec A.



Hygiene Lavanda T5 C3 installed in an edge A system





Photo: Mikael Krasterson



Photo: Martin Wagnhorn

A good sound environment provides better conditions for teamwork and easier communication.

# Contact us

## **for an optimal solution**

Many factors determine which system best meets the requirements and expectations for a specific room. These factors include impact from air and operations, regulations, safety aspects, cleaning requirements, special conditions etc. All these factors must be taken into account in an evaluation process. This is best done in consultation with Ecophon's representative to satisfy the specific needs of each individual industrial facility. Our aim is to suggest the optimum solution for the company and its employees.

### **Read more on our website**

Visit our website to find out more about Ecophon and our acoustic solutions for the pharmaceutical industry. You will also find more technical information about our system and a description of the standards we follow and the tests we have performed.

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

# Ecophon®

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

