

# Noise reduction

in the electronics industry





### **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 values 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. In practice, this means reducing the auditory strength and limiting reverberation in the 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.

Less noise creates a calm, pleasant atmosphere, and provides a higher degree of safety.

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: Marcin Zeglinski. Technical photographs: Studior.

# Sound is an important part of the working environment

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 electronics 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 modern electronic 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 electronics industry, the environment must be controlled to ensure high product quality throughout the production chain. Controlled ventilation and an electrostatic discharge (ESD) protection system are also necessary. Moreover, all products and material installed in the premises must satisfy strict demands. In particular, particle emissions can cause problems, leading to downtime or a risk of substandard products entering the market. The consequences can be disastrous in both practical and economic terms.

### **Pressurised rooms**

Some rooms in the electronics 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 Systems are suitable as a ceiling when there is equal pressure below and above the ceiling.

### **Customer requirements, standards and regulations**

Electronics manufacturers must be able to prove that they satisfy customer and government cleanliness requirements. The ISO classification of air cleanliness is normally applied. ISO 14644-1 certification is based on nine clean room classifications, which regulate the quantity of particles permitted in the air.

### **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. acids, alcohols, chlorides)
- Physical contaminants (e.g. dust)

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

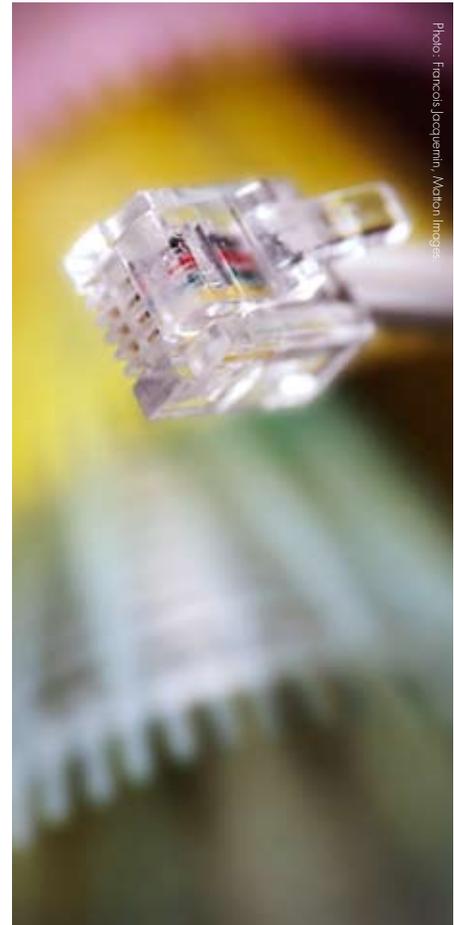
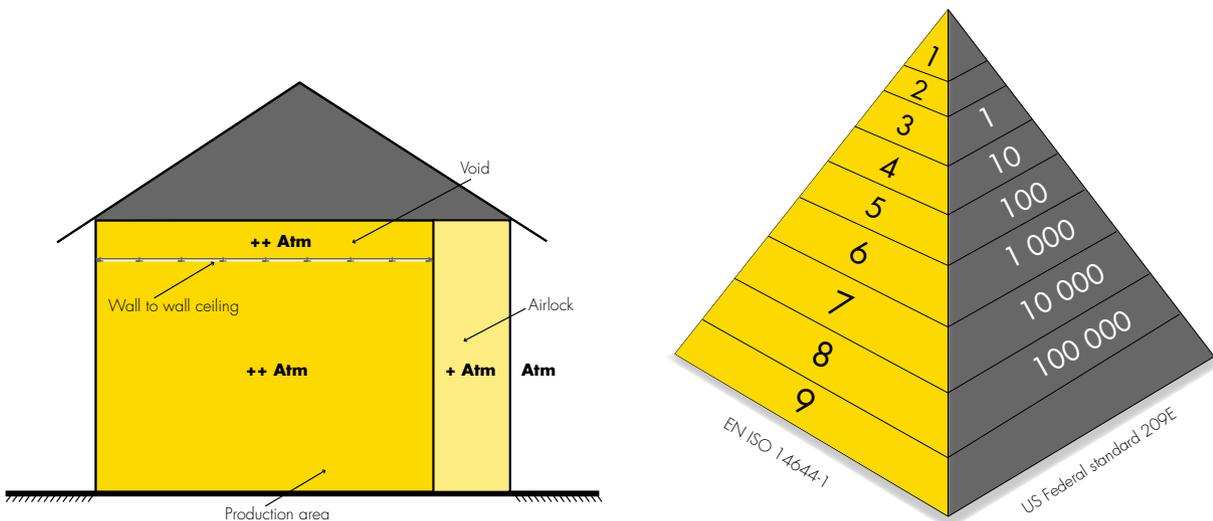




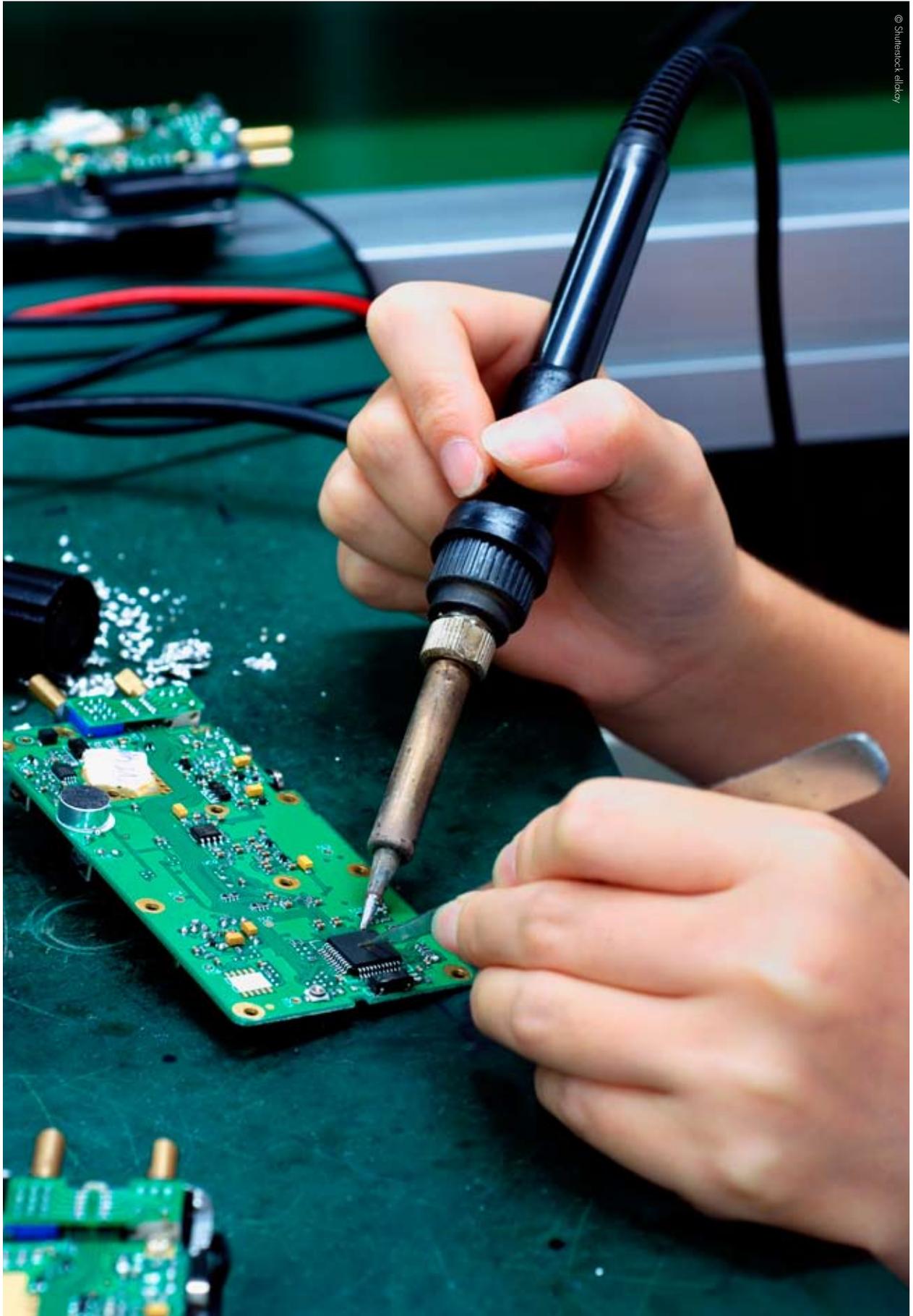
Photo: Doregon Reese, Motion Ingress.

For situations requiring concentration, a good sound environment provides opportunities for increased productivity.



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.



A good sound environment provides better conditions for high quality operations.

# 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 an electronics manufacturing facility have different cleanliness 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 or normal atmosphere
- Permitted materials
- Type of contaminants

## 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.

All products and systems installed in the electronics industry must withstand the established cleaning methods. The most widely used detergents are alcohol, acid, hypochlorite and/or tenside-based. For this reason, Ecophon uses these detergents and methods in its development and testing operations.

## 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 electronics industry.



Recommended  
by the  
Swedish Asthma  
and Allergy Association

# Ecophon Hygiene System

## for the electronics industry

For many years, we have been supplying sound absorbers to electronics manufacturers such as Ericsson. We have constantly developed our systems, 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 latter have 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 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



Hygiene Labotec Ds C1 system

### Ecophon Hygiene Labotec™ Ds C1

Ceilings for laboratory environments. The system is compliant with 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. The Ds system has only vertical joints.
- 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 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 or disinfected. The system is compliant with 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



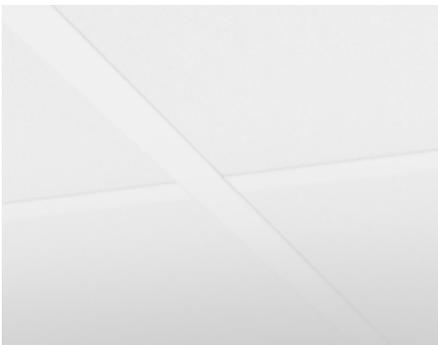
Ceilings for rooms that are occasionally cleaned or disinfected. The system is compliant with ISO class 5 according to ISO 14644-1.

### 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 absorbents 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



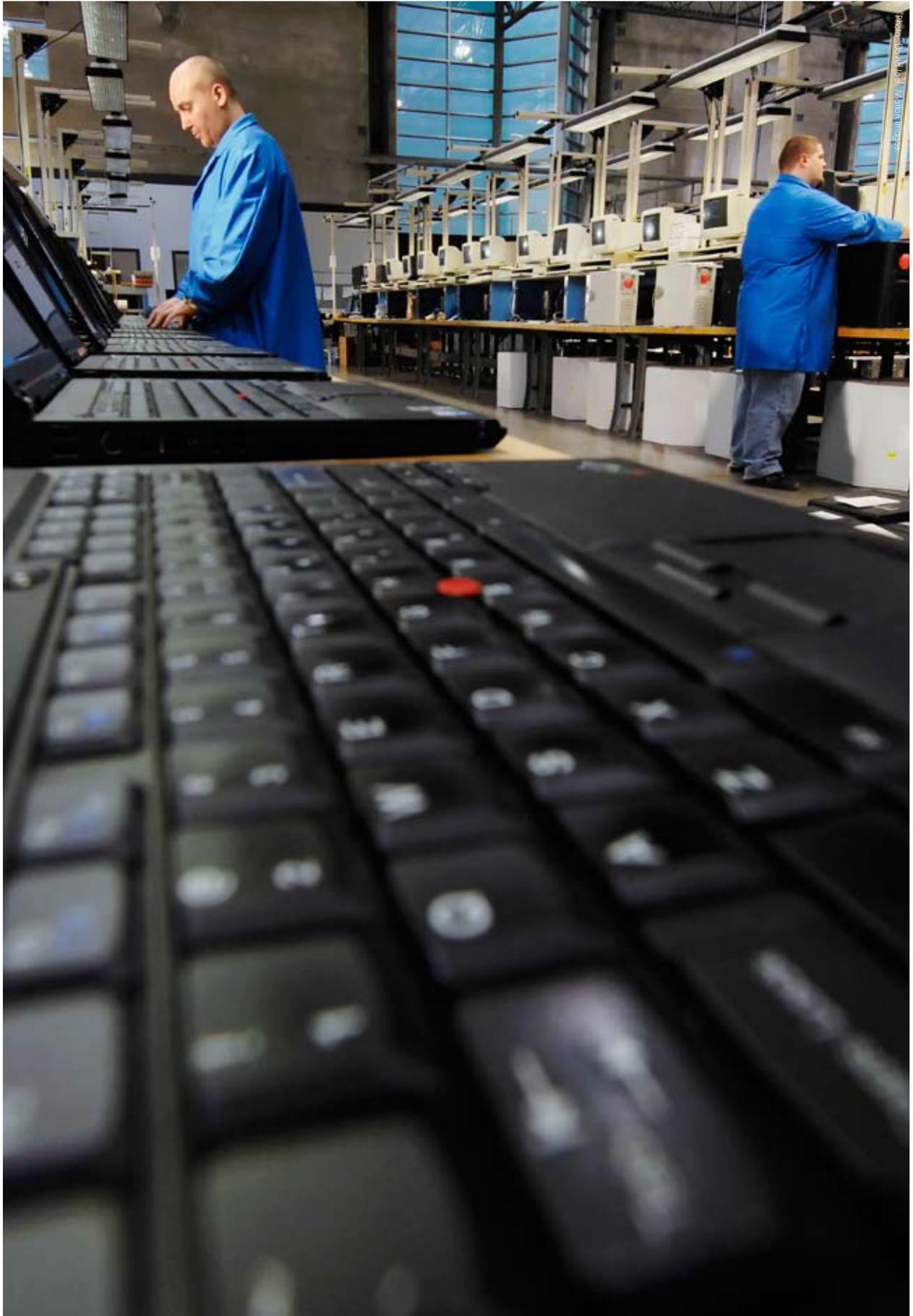
Ceiling System



Baffle System



Wall System



At the quality check stage, a good sound environment increases the possibilities of detecting defects.

# 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 read more about Ecophon and our acoustic solutions for the electronic industry. You will also find more technical information about our systems 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)

