

### RESTAURANTS and DINING ROOMS

#### *WHY DO WE NEED TO CONTROL NOISE IN RESTAURANTS and DINING ROOMS?*

##### **Traditional restaurants or works canteens:**

These are special places for human relations, where good food and a convivial atmosphere are essential factors in addition to a certain level of acoustic protection.

The level of noise in these areas is linked to their acoustic performance and to the number of people present.

It is necessary to raise ones voice when talking or having a chat in a noisy place. However, when this happens the people near you in turn have to raise their voices. The noise level quickly rises - this is the cocktail effect.

This can be easily avoided by the use of an absorbent acoustic system. The exact type of system to use must be carefully considered in order to avoid creating an area where sound is either deadened or made to reverberate too much.

##### **School Restaurants:**

In non-treated canteens, the levels of noise created by children can reach 85 to 90 dB(A) - in the workplace, current legislation states that such levels are dangerous. A few cases of occupational deafness have been recorded amongst canteen and supervisory staff. The children themselves show signs of aggressive behaviour, fatigue and difficulty in following afternoon lessons.

In an acoustically treated area, the ambience is more peaceful, the children finish their meal and the supervisors have to intervene less frequently.

**Whatever the type of restaurant, acoustic comfort must be taken into account at the design stage of the building.**

### *INTERNAL CORRECTION*

This concerns the internal comfort of the restaurant or dining room.

There is no specific legislation relating to this type of premises; the only objective is the comfort of the occupants.

In the case of school restaurants, the Department for Education recommends a reverberation time at 500 Hz of between 0.8 and 1.7 seconds for Dining Halls between 250 and 550 m<sup>2</sup> in area.

In cafeterias and restaurants a Tr value in the region of 1.8 seconds generally creates a sufficiently comfortable environment.

However, because reverberation time is determined by the shape and composition of the internal surfaces it is not possible to give any generalised rules. It is recommended that an acoustic analysis is undertaken, using computer simulation techniques.

### *INSULATION WITH RESPECT TO THE EXTERNAL ENVIRONMENT*

This concerns the transmission of noise from the inside to the outside of the building and vice versa.

In general and to ensure the comfort of its users, the noise inside a restaurant should not exceed 54 to 58 dB(A). This is the level at which it is possible to hold a conversation at a metre's distance without raising ones voice.

Department for Education guidelines recommend a maximum background noise level from adjacent areas, ventilation and traffic noise ( $LA_{eq,8hr}$ ) of 50 and minimum insulation between similar rooms ( $D_w$ (dB)) of 33. Local planning requirements are likely to further limit the amount of sound escaping from the building in order to protect people living nearby or within the same building.

Such characteristics depend upon the type of materials used in the building's construction and the distance from its neighbours.

The performance of a roof or wall is limited by weak points (doors, windows, ducts, chimneys, etc....) and therefore specifying even the highest quality cladding could prove to be a futile exercise. (A concrete wall one metre thick will be completely ineffective if the doors and windows are left open).

**An acoustic analysis will identify the optimum achievable performance and the most suitable materials to be specified.**

**ESSENTIAL INFORMATION REQUIRED FOR AN ACOUSTIC ANALYSIS**

**Internal Correction**

- plans and sections showing the internal layout of the premises
- type and composition of the internal surfaces - walls, floor and roof
- report on any existing acoustic control measures or previous acoustic studies
- type of treatment envisaged - wall, ceiling, partitioning...
- any specific aesthetic requirements

**Insulation with respect to the exterior of the building**

- plans and sections showing the external layout and its environment
- type and composition of all external surfaces - doors, windows , walls, ventilation units...
- report on any measures already undertaken or previous acoustic studies
- any specific aesthetic requirements

**MATERIAL CHARACTERISTICS**

The materials to be used in the construction must:

- be as absorbent as possible, especially at frequencies of 500 to 2000 Hz. Without giving precise recommendations, the material chosen for the ceiling should have an absorption coefficient greater than 0.6 between 500 to 2000 Hz.
- be shock-resistant and durable
- be non-combustible
- be designed to eliminate the problems caused by condensation

Priority:

Because of its large surface area treatment of the roof or ceiling is vital. The materials must be positioned as closely as possible to the occupants. This can be achieved by installing an acoustic blanket or ceiling as low as possible, by treating the walls near where it meets the roof or ceiling and eventually by internal partitions.

**SOLUTIONS FROM AXTER**

**Internal correction**

The following systems meet the conditions commonly required in restaurants and dining halls:

Roof:	<b>THERMOSON A SUPER ALPHA AQUALPHA</b>
Cladding:	<b>ANTISON</b>

For premises with high levels of humidity, AQUALPHA is the only possibility.

**Internal correction + insulation**

In most cases, the products mentioned above will suffice. In more severe cases, **THERMOSON A** roofing system and **THERMOSON A or B** cladding can be installed.

## EXAMPLE

### 3rd LYCEE at BLOIS

#### Parties involved:

Building Owner	Regional Council
Architect	François DUPLEIX
Control Body	SOCOTEC

#### History:

The Regional Council's concern from the start was ensuring the well-being of the students by providing them with a modern, aesthetically pleasing and functional environment. The acoustic element was an integral part of the project from the very beginning. The restaurant was given a roof made up of THERMOSON A installed in waves, (surface 2400m<sup>2</sup>). Height up to the roof is between 4 and 6.5m.

#### Results:

##### Noise level:

In the restaurant, with approximately 100 people present, the recorded level is **58 dB(A)**, which allows easy conversation between pupils without causing discomfort for people close by.

##### Reverberation Time:

At the time the school was built the French Department of Education recommended a maximum Tr of 1.2 seconds; the school restaurant recorded a **Tr of 0.9 seconds**.

The particular shape of the restaurant, together with the THERMOSON A, roof design has achieved an acoustically comfortable area which is fully appreciated by the people who use it.

#### Bibliography:

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5. Le bruit dans les salles de restaurant" par S Auzou, P Crestois, R Josse, M Vidal; cahier du CSTB n°2265 Sept. 1988

