

Noise in the Office Environment – An Overview

acoustics at workTM
FURNISHHH YOUR OFFICE





Why is Noise in Offices a Problem?

The modern workplace is now an open plan arena. The private office has been swept away, as more flexible working practices have emerged.

Yet for all their advantages, most open plan offices still suffer from the distractions of reverberant noise.

“Open offices not for everyone: Research indicates that while employers like them, employees don’t — and shouldn’t” - JON TATTRIE FOR METRO CANA

“Open-plan offices are to blame for worker illness and reduced productivity, a new study has revealed” – SKY NEWS

“Working in an open-plan office increases stress, conflict and illness among staff, research shows” – INSTITUTE OF LEADERSHIP & MANAGEMENT

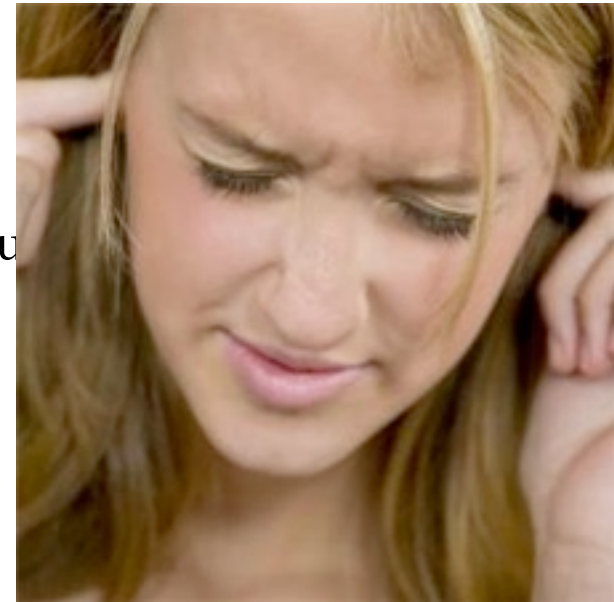
“Feeling stressed at work? Could be your open office plan” - DAILY NEWS

“Your Office is Killing You” – CITYFILE, NY



What does the Research Say?

- More than 70% of workers believe that noise is the most significant distraction
- More than 80% of workers believe that a quieter environment would enable them to be more productive
- The majority of workers believe that reducing distracting noise increases their productivity
- The majority of workers identify conversation as the type of noise that most affects their work performance





And...

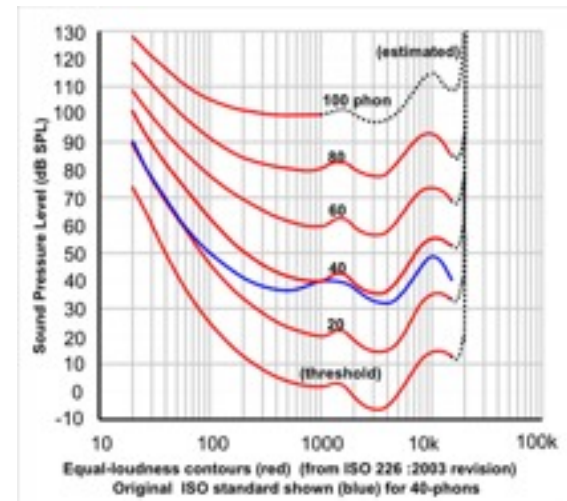
- Over 50% of cubical workers expressed that acoustics interfere with their daily work
- Over 30% of private office occupants also felt that acoustics influenced their productivity
- The accuracy of tasks involving memory and arithmetic decreased by 67% when subjects were exposed to noise
- Employees are unable to habituate to this kind of noise overtime – this problem does not get better!





Why is noise so distracting?

- Our auditory system is tuned to be sensitive to speech sounds...
- Certain sounds cannot be ignored
- When we can't acclimatise to sounds
- auditory fatigue

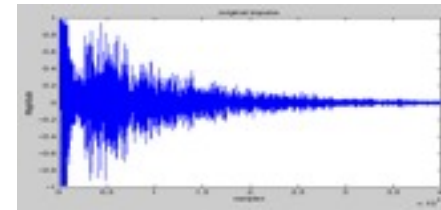
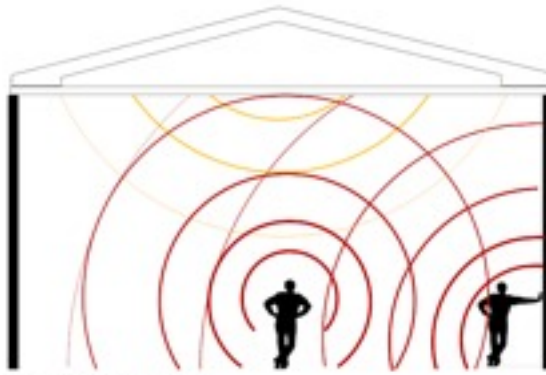


- +++ stress → increased blood pressure
→ decreased immune response
→ increase absenteeism



The Acoustician's Approach...

- Determine if the problem is elevated noise levels, poor speech intelligibility or poor speech privacy.
- Reverberation Time → The cocktail party effect

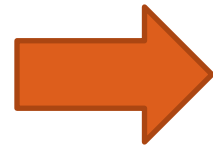


- Optimal Reverberation Time





There must be an easier way!



You need an additional 150 absorption points!



Solving the Problem



Absorb



Block



Cover



Solving the Problem





Furniture: Screens



**Still Linear,
Still Open,
But Workable.**



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Offices within offices



Containing Sound



Offices within offices – speech privacy

Screen 5.2 Levels of Speech Privacy

Speech Privacy is linked to the amount of speech disturbance between two people who are not in conversation with each other. The degree of Speech Privacy in any situation is established by measurement of the Privacy Index. The Privacy Index is expressed as a percentage where 0 is no privacy and 100 is complete privacy. Privacy Index is dependent upon the talker voice level, sound attenuation between the talker and the listener due to the local environment and the ambient noise level at the listener. The range of the Privacy Index assigned to each degree of Speech Privacy is shown in the table. The following results were obtained for a normal speech level of 60 dB(A) and ambient noise level of 48dB(A).

Privacy Index %	Speech Privacy
95 - 100	Confidential
80 - 95	Normal
60 - 80	Transitional
<60	None

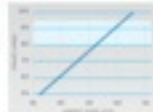
No Ceiling

ANL = 48 dB(A)
PI = 75%
Transitional Privacy
Air Gap = 9m²



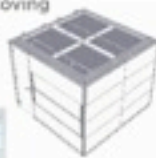
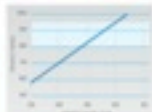
Master Solo

ANL = 48 dB(A)
PI = 87%
Normal Privacy
Air Gap = 3.24m²



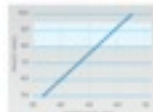
Master Solo & Coving

ANL = 48 dB(A)
PI = 92%
Normal Privacy
Air Gap = 1.75m²

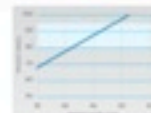


Ecophon Edge

ANL = 48 dB(A)
PI = 85%
Normal Privacy
Air Gap = 2.24m²



Ecophon Edge with Coving



ANL = 48 dB(A)
PI = 95%
Confidential Privacy
Air Gap = 0.75m²

N.B. Substitution of acoustic panels with glazed panels will reduce NPI.



Furniture: Seating

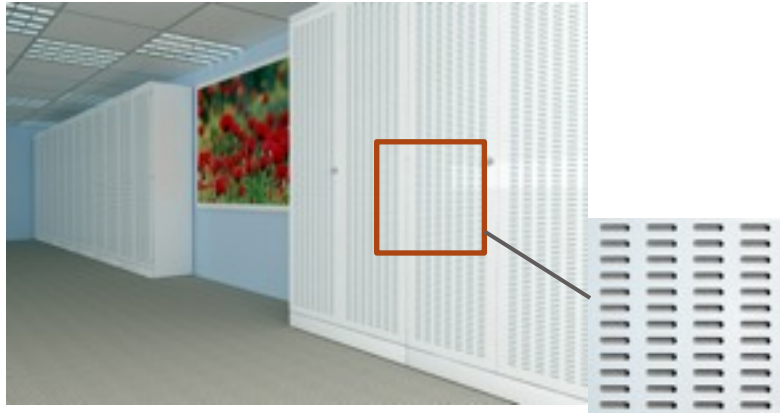


Sit down... And Listen!

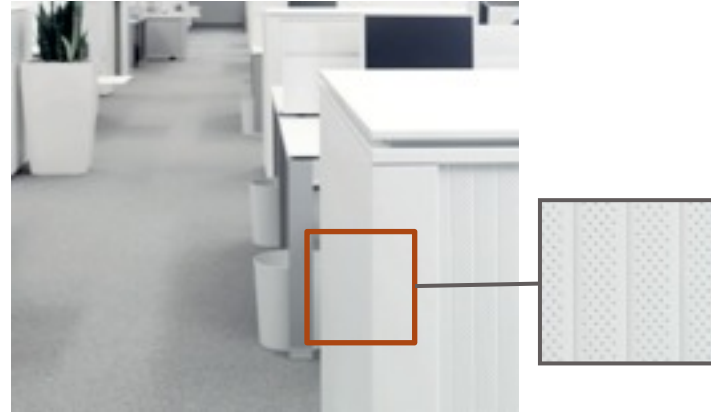


Furniture: Storage

Wall Storage



Tambour Units





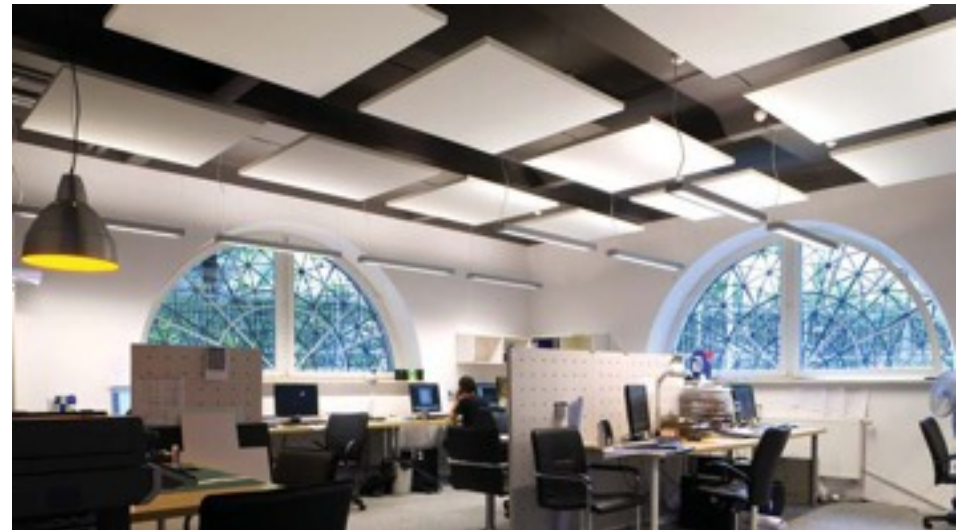
Ceilings: Tiles





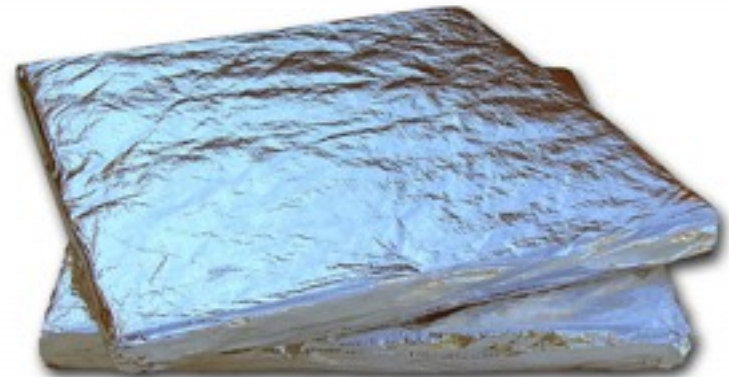
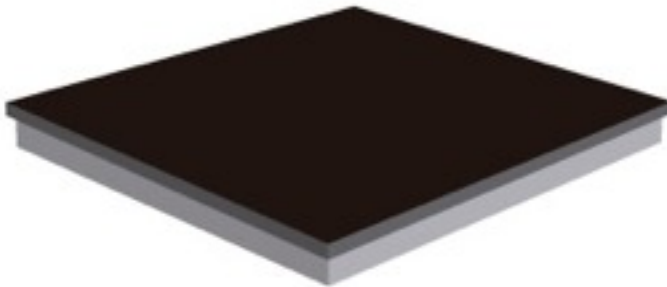
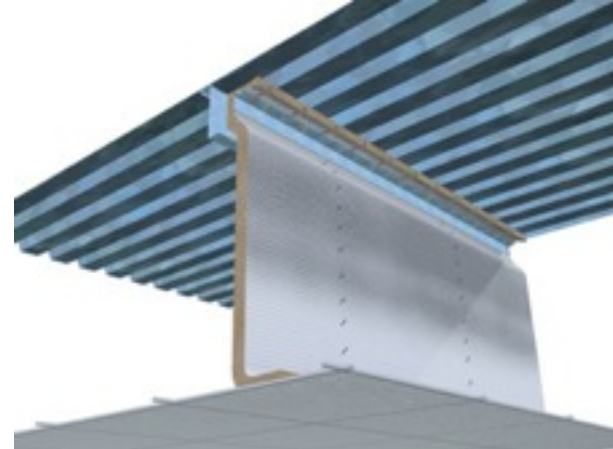
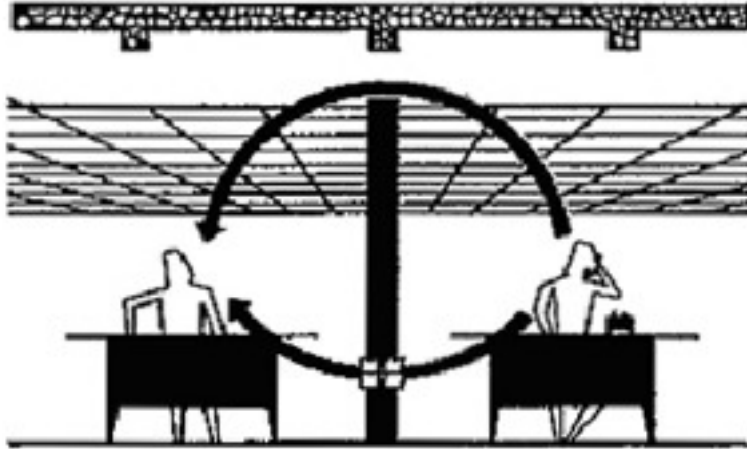
Ceilings: Panels

Absorbing Overheads





Ceilings: Acoustic Barriers





Walls and Windows: Blinds

Not just window dressing...





Partitions

The silent screen





Acoustic Wall Panels



Walls have ears



Floors: Carpeting



Underlying principles

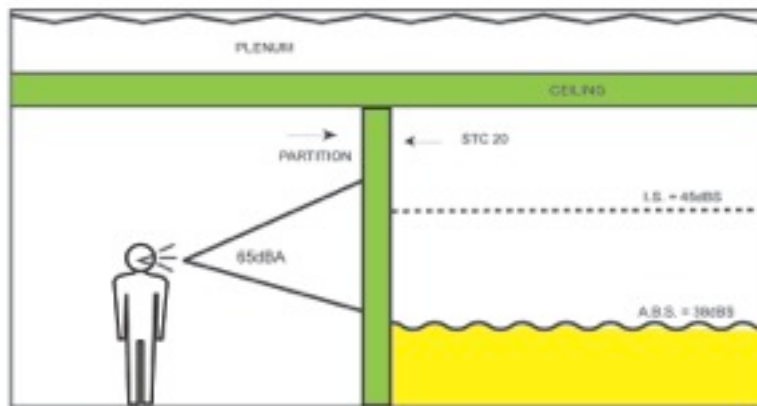
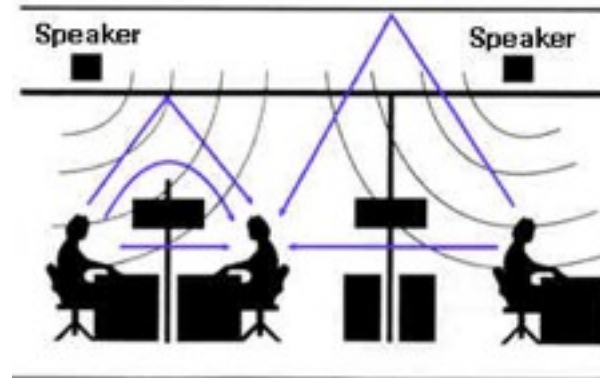


Sound Masking Systems



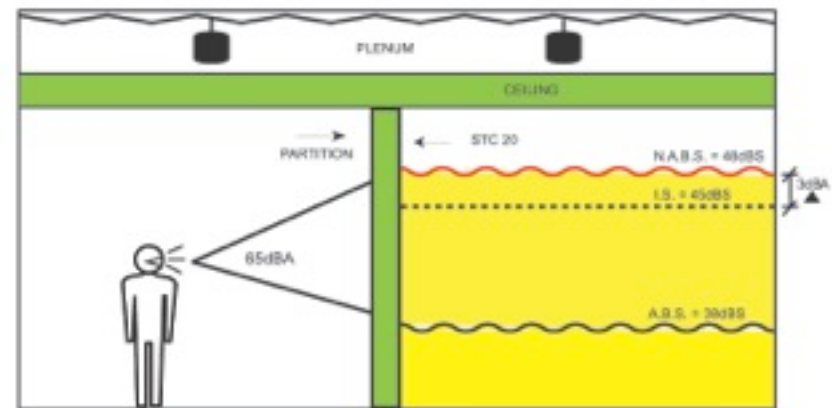


How does sound masking work?



No Masking

LEGEND
N.A.B.S. = New Ambient Background Sound
I.S. = Incoming Speech
A.B.S. = Ambient Background Sound



With Masking

LEGEND
N.A.B.S. = New Ambient Background Sound
I.S. = Incoming Speech
A.B.S. = Ambient Background Sound



What are the results?

- 300% increase in perceived worker satisfaction
- 20% increase in measured sales productivity over 6 months
- 48% increase in task focus
- 51% decrease in conversational distractions
- 10% improvement in tasks relating to accuracy and memory
- 27% reduction in physical symptoms of stress





To Recap:

- If more people (i.e. Noise makers) are to be fitted into less space, one has to take the implication of the acoustics and therefore the productivity of the workers into account.
- The research shows that acoustics are important to people in the workplace and improving acoustics can improve worker satisfaction, health, and productivity
- There are many products and modified furniture on the market, each with advantages and disadvantages.
- One must be aware of the limitations of certain products in certain environments so as not to incorrectly specify them
- A combination of products, especially screens and ceilings, forms an acoustic solution, rather than just one product

Questions and Answers

Shhhh