OFFICE SPACE

Workplace Freedom

Newsletter Nov'14: Acoustics

Open plan offices have become widely popular because they are cost effective and flexible. Many organisations also find they can improve cooperation and communication within and between different teams. However, noise levels and lack of privacy can create concerns for people working in open plan offices.

Consideration needs to be given to the type of organisation and its main line of business. Certain types of companies require much higher levels of privacy and hence acoustic integrity due to the nature of their work, such as a law firm or private bank. In such cases the use of appropriate and suitable partitions may be a priority within the office interior. On the other hand, in an open plan call centre the reduction of noise via other means, such as the specification of suitable and appropriate carpet and furniture systems is key. Therefore the nature of the business and the type of work which takes place within the workplace needs to be closely looked at when designing a commercial space.

The word 'acoustics' is borrowed from the Greek "akouein", which means "to hear" and is now used to describe the scientific study of sound and vibration and its behaviour in various media and environments.

Unwanted sound that is annoying or interferes with listening is described as noise.

Excessive noise levels can affect concentration and become an obstacle to normal activity.

The basics of building acoustics

When sound reaches a surface, there are several possible outcomes that can occur individually or simultaneously.

A. The sound passes through the surface into the space beyond.
B. The surface absorbs the sound.
C. The sound strikes the surface and changes direction.

In an open plan office, sound is transmitted directly and reflected off the ceiling. Factors that contribute to unacceptable noise levels include heating, ventilation and air-conditioning systems, low partition heights, ringing phones, noisy copy machines and office chatter.

The use of absorbing ceiling and floor covering materials is essential to reduce unwanted noise.

Carpet plays an important role in reducing sound reverberation, because it absorbs up to 10 times more airborne noise than any other flooring material. This can considerably enhance the feeling of wellbeing.

Other materials such as furniture with sound absorbing surfaces, partitions, upholstery, curtains and drapes also contribute to acoustics as the coefficients of all the different materials in a room combine to increase the overall sound absorption.

To achieve the best overall result the sound absorbing materials should be used on all surfaces; walls, ceilings and floors. Therefore, an integrated design approach is essential to achieving good acoustics.

Sound acoustics in the workplace - from the floor up

The business benefits of a happy, healthy workforce

Every year millions of working days are lost due to work-related illness, resulting in lost productivity and huge costs for employers.

At Interface they know that our physical experiences impact on how we feel. And they understand the importance of having a great place to work. Designers and architects have a crucial role to play in providing inspirational environments that facilitate flexible working, for the benefit of both employers and employees.

Modular carpet and the holistic interior

Generally employees will feel much more inspired if they are able to move around but open plan workspaces also pose acoustic challenges.

Interface modular carpet was developed for the changing workplace. It effectively absorbs sound and reduces impact noise at the source, yet is also ideal for zoning areas for a range of activities, from collaboration and concentration to relaxation and recreation.

What kind of acoustic environment do you want to create?

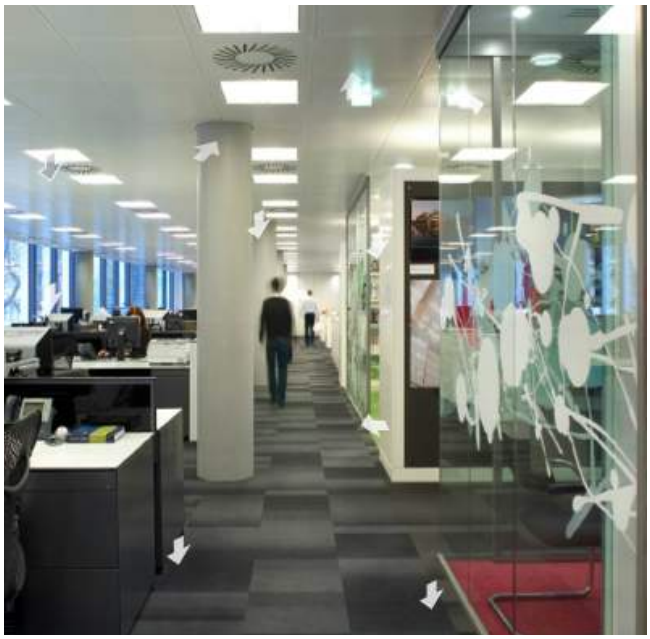
The acoustic requirements of an interior will always vary from project to project and building to building

Improving the intelligibility of speech in a class room or a meeting space will require different solutions to creating a feeling of privacy in an open office space.

If you can hear someone talking while you're reading or writing, your productivity dips by up to 66%.

Impact sound

Impacts on a surface from, for example, footsteps, chairs being moved or objects being dropped create vibrations within the surface which become sound waves when transmitted to the air. Impact noise is mainly transmitted through the floor but it can also reverberate through the walls.



A good acoustic environment is always the result of many factors, but to effectively control noise from footsteps and other impacts, no flooring alternative is more effective than carpet.

Impact sound transmission, measured in decibels, tells you how much sound is insulated from an adjacent space. Our products reduce impact noise by 14-34dB, compared for hard flooring which is just 1-6dB.

Sound absorption

Humans are less sensitive to low frequencies, making the absorption of mid to high frequency sounds more important.

Soft surfaces absorb more sound than hard surfaces but acoustic quality is a result of all the different features in room and not just the flooring.

Design choice

For the majority of projects, acoustic and ergonomic comfort can be achieved with the specification of standard Interface carpet tiles.

With a variety of textures and over 1000 colourways across 80 ranges, your scheme doesn't have to be compromised when you need to control the acoustic properties of the interior. Our enhanced acoustic backing options, SONE™ and Interlay, can be used across the entire workspace or limited to smaller zoned areas that have more complex needs.

Reducing noise through furniture specification

With open plan spaces the importance of good acoustics in an office environment has grown with the increasing use of furniture systems.

Desk dividing screens

With only partial height furniture panels separating workstations, sound — from conversations, speakerphones, computers, mechanical equipment and other sources — can often travel uninterrupted from the source to surrounding workstations. Therefore, choosing the right screens is an extremely important decision in creating an acoustically sound space.

In open plan areas with high noise levels, such as for example in call centres, panels should be at least 1600mm high in order to provide sufficient noise reduction. This is above the standard 1200mm seated mouth-ear height and will be sufficiently high to block most noise from entering or leaving individual workstations. The most common problem in open office spaces is panels that are too low, and sometimes don't even give visual privacy.

Teknion's desking systems such as *Interpret* allow varied levels of openness and privacy through a range of screen heights, reconfigurable screen elements and sliding screens.

Interpret has a range of screens that define space and offer varied degrees of acoustic and visual privacy. Screens mount on- or off-module and may be specified with fabric, wood or painted metal in contemporary accent colors. Sound absorbing fabric offers the best noise reduction as opposed to a hard material screen.

Alternatively, functional screen options include whiteboard, magnetic and accessory screens. Glass add-on screens create height and a greater sense of enclosure. Additionally, *Interpret* offers transparent and opaque casual screens without frames and sliding screens that users can open or close at will.

Freestanding screens

Freestanding office screens are generally located near office desks, storage and seating to create a zonal space. Freestanding screens can offer acoustic properties, pose as writable surfaces for training or be pinnable to allow changeable information.

Lite Wall™ is a series of lightweight screens that respond to varying needs of the open office, quickly configuring to provide privacy or space delineation where needed. Designed using concealed magnets, *Lite Wall* easily repositions without visible connections. The screens can also be used as standalone elements with the use of integrated legs.

Acoustic seating

High back soft seating allows workspaces to reduce the need for office screening and partitioning. The high back of the seating modules acts as an acoustic block ideal for the busy workplace of today. The acoustic chairs, like furniture, can be placed almost anywhere within the office and have multiple uses; making private phone calls, collaboration and meeting and above all, a space to relax.

The sofa ranges sit or link together to create different layouts depending on requirement. Upholstered in wool fabrics or leathers, modular seating is also to be considered within reception, breakout and hallway waiting areas.

Teknion Studios' Fractals™ Seating Group was conceived with two important criteria in mind: to support the worker and groups of team-based workers in open and collaborative environments, and to provide a modular program that, in its articulation, creates a new level of planning, suitable within reception, breakout and hallway waiting areas.

Fractals includes three simple pieces: a lounge chair, an ottoman/bench and a settee, with a lower or an optional higher back that creates a degree of surround and privacy.

Acoustic integrity through demountable partitions

In today's modern office environment, office partitions must be able to offer aesthetics as well as acoustic performance. JEB has several systems that are able to provide both, as well as offering design creativity and flexibility.

To design the optimum conditions for an office work environment, it's important to first understand the activities that will take place within it and what the acoustic requirements are for these activities. It is the relationship between the person, the room and the activity that determines the room's acoustic comfort, and ultimately the well being and performance of the people who use it.

Creative office designs today certainly maximise the use of open space wherever possible; while this is a popular design trend there is still a need for a level of noise privacy. This often necessitates a strong emphasis on the placement of glass partitions with suitable acoustic performance as part of the overall office layout.

Glass partitions provide a necessary physical and noise barrier. At the same time they also provide partial visual privacy through the use of film applied to the surface but still allowing intended visual contact and transfer of natural light. They provide connectivity while still allowing a physical separation.

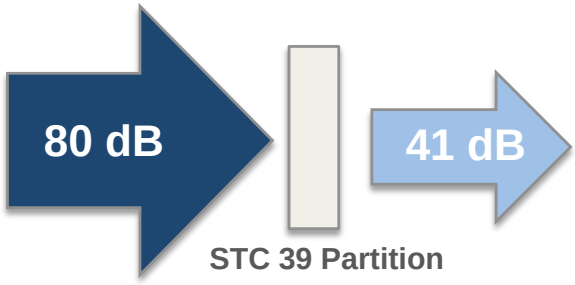
Traditionally, the noise blocking function has been carried out by gypsum partitions in various configurations. However, with the need to make quick changes in the partitioning of spaces, there is an increased use of reusable, reconfigurable, demountable partitions. These have some remarkable design features and can achieve very high sound transmission coefficients.

Sound Transmission Class (or STC) is an integer rating of how well a building partition attenuates airborne sound. The STC rating figure very roughly reflects the decibel reduction in noise that a partition can provide. The higher the rating, the higher the noise reduction.

Specifying Sound Rated Walls

- STC 53 minimum to isolate video conference and training rooms.
- STC 42 minimum to separate conference rooms and executive office areas requiring confidential speech privacy.
- STC 28-32 minimum to separate private offices required in normal speech privacy.

Using toughened glass which is 10mm thick gives the best balance between cost, strength, ease of handling and sound insulation. It is as an important part of insulating your partition for sound to ensure the gaps between the glass and framing around it are sound insulated. It is important to ensure that the perimeter of the glass has a tight rubber seal which holds the glass firmly and does not allow it to vibrate, but instead absorbs and sound vibrations, thus acting as a sound damper.



JEB has various partition systems suitable for a range of requirements and accordingly, offering various degrees of acoustic integrity/ STC ratings. Below is a selection of some of the systems.

System: X-SERIES

- Double Glass Partition - STC 49
- Double Glass Door - STC 31 (fully caulked - STC 46)
- Single Glass Partition - STC 28-32

System: DIVIDE

- Solid partition with range of finishes
- Double or single glazed partition (6mm or 8mm glass
- Solid Partition – STC 48
- Double Glazed Partition – STC 47

System: INTEGRA Operable Wall

- Double Glazed Operable Wall: STC 44
- Solid Operable Wall: up to STC 52