SCREENS®
AT WORK

frem group

acoustic pods & hubs

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

> Research identified ‘noise’ as a likely cause of employee dissatisfaction with the work atmosphere in terms of low motivation to work, reduced performance and irritation.
>
> (Ooman, Knowles & Zhao 2008)

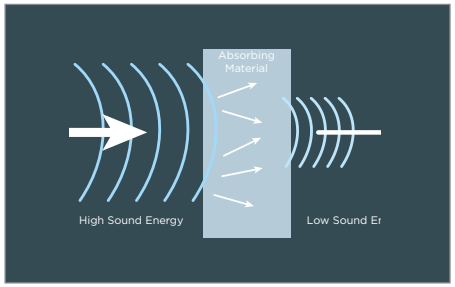
In the modern workplace, the emphasis is on teamwork, flexibility and communication. For most companies and designers, this means open plan work areas. Gone are the days of being tucked away in private offices. But while the move to open plan has many advantages, it has also meant a loss of privacy and the constant distraction of noise. **Screens at Work** have the solution. We can help you manage sound levels with a high degree of accuracy, ensuring that productivity and privacy needs are met.

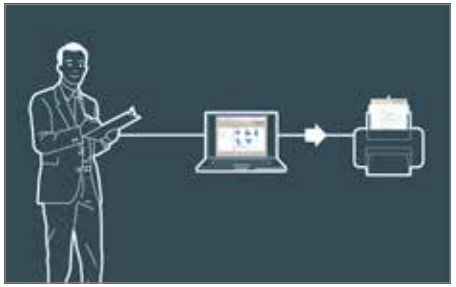
The Range

Screens at Work have developed a range of lightweight, modular, acoustic pods and hubs which can create a multitude of high performance acoustic environments for a variety of uses - for example, Pods, meeting rooms and break out areas.

The design of the walls and the patented roof system is such that sound absorption is optimised whilst still allowing the free flow of existing air conditioning system.

The system is demountable and can easily be reconfigured and, unlike partitioning, there are no dilapidation costs to consider.





The Case Against Noise: Research findings confirm its negative effects - Improvements resulting from increased speech privacy.

Focus	The ability of office workers to focus on their tasks **improved by 47%**
Distractions	"Conversational distractions" **decreased by 51%**
Error-rates	Performance of standard "information worker" tasks (measured in terms of accuracy [error-rated] and short-term memory) **improved by 10%**
Stress	When measured in terms of the actual physical symptoms of stress, **stress was reduced by 27%**

David M. Sykes, Ph.D. (2004)

Workplace Perceptions and Attitudes

More than **70%** of workers believe noise is the most significant workplace distraction

Over **80%** of workers believe a quieter environment would enable them to be more productive

The **majority** of workers believe reducing distracting noise increases their productivity

The **majority** of workers identify conversation as the type of noise that most affects work performance

Armstrong World Industries. Dynasound, Milliken & Company, Steelcase, and the American Society of Interior Designers (2005)

5.2 Pod Glazed

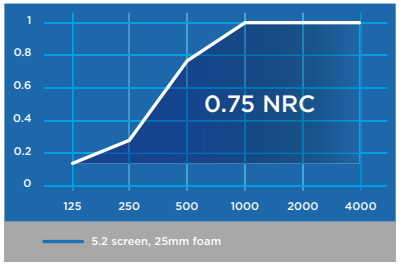
At 70mm, this screen is not only very rigid, it can also carry a lot of weight externally and a lot of Acoustic foam internally. The permutations are endless with this screen and the addition of an acoustic ceiling achieves a high level of speech privacy.

The design of the walls and the optional patented roof system is such that sound reduction and sound absorption is optimised whilst still allowing the free flow of existing air conditioning system.

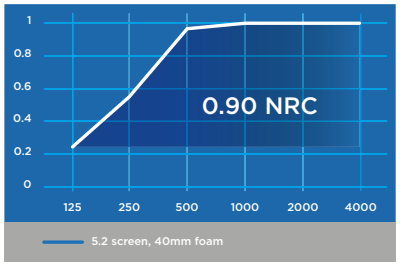
The system is demountable and can easily be reconfigured and, unlike partitioning, there are no dilapidation costs to consider.

Typical acoustic points
Panel size 1800mm x 600mm
25mm foam = **8** points, 40mm foam = **10** points
Points score refers to one side of the screen only
For further information on our patented Acoustic Points System see pages 42-45.

Weighted Sound Reduction Index (*R*w) = 30dB
Sound Transmission Class (STC) = 30dB



N.B. A screen with an NRC of 0.75 absorbs 75% of all sound that hits it.



N.B. A screen with an NRC of 0.90 absorbs 90% of all sound that hits it.

5.2 Pod Glazed


SCREENS
AT WORK

5.2 Pod Tiled

At 70mm, this screen is not only very rigid, it can also carry a lot of weight externally and a lot of Acoustic foam internally. The permutations are endless with this screen and the addition of an acoustic ceiling achieves a high level of speech privacy.

The design of the walls and the optional patented roof system is such that sound reduction and sound absorption is optimised whilst still allowing the free flow of existing air conditioning system.

The system is demountable and can easily be reconfigured and, unlike partitioning, there are no dilapidation costs to consider.

Typical acoustic points
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25mm foam = **8** points, 40mm foam = **10** points
Points score refers to one side of the screen only
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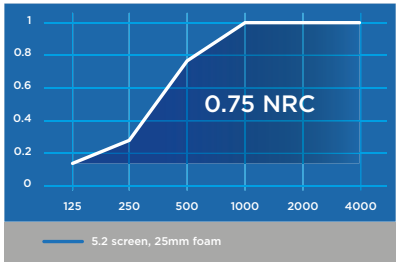
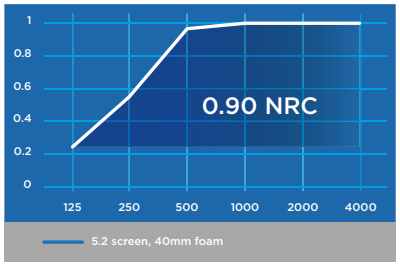
Weighted Sound Reduction Index (*R*w) = 30dB
Sound Transmission Class (STC) = 30dB



N.B. A screen with an NRC of 0.75 absorbs 75% of all sound that hits it.



N.B. A screen with an NRC of 0.90 absorbs 90% of all sound that hits it.

Screen 5.2 Levels of speech privacy

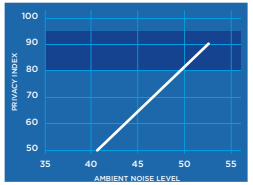
Speech Privacy is linked to the amount of speech disturbance between two people who are not in conversation with each other. The degree of Speech Privacy in any situation is established by measurement of the Privacy Index. The Privacy Index is expressed as a percentage where 0 is no privacy and 100 is complete privacy.

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

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).

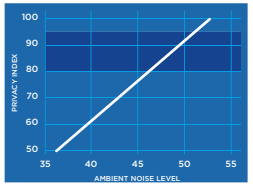
No Ceiling

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



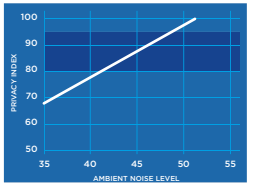
Baffles Ceiling (200mm gap)

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



Grid Ceiling (50mm gap)

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



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

5.2 Pod Tiled

4.2 Pod Lite 3000

The ultimate acoustic screen.

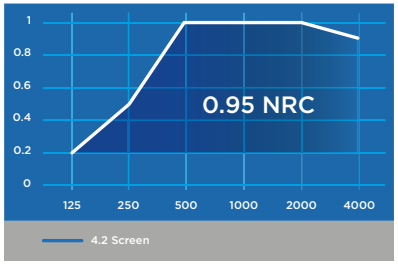
Screen 4.2 Pod Lite 3000 is a range of modular light weight high performance Acoustic screens that can create, within the office, effective acoustic environments for a multitude of uses with a diameter of 3000mm – Pods, meeting rooms, breakout areas and many others.

The design of the walls and the optional patented roof system is such that sound reduction and sound absorption is optimised whilst still allowing the free flow of existing air conditioning system.

The system is demountable and can easily be reconfigured and, unlike partitioning, there are no dilapidation costs to consider.

Typical acoustic points
1m x 1m of panel = **10** points
Points score refers to one side of the screen only
For further information on our patented Acoustic Points System see pages 42-45.

Weighted Sound Reduction Index (*R*w) = 28dB
Sound Transmission Class (STC) = 28dB



N.B. A screen with an NRC of 0.95 absorbs 95% of all sound that hits it.

Screen 4.2 Levels of speech privacy

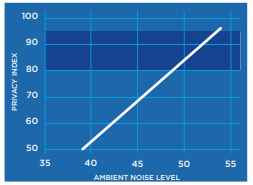
Speech Privacy is linked to the amount of speech disturbance between two people who are not in conversation with each other. The degree of Speech Privacy in any situation is established by measurement of the Privacy Index. The Privacy Index is expressed as a percentage where 0 is no privacy and 100 is complete privacy.

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

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).

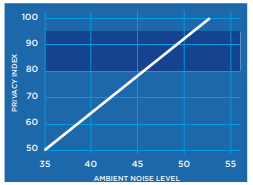
No Ceiling

ANL = 48 dB(A)
PI = 80%
Transitional Privacy
Air Gap = 9m²



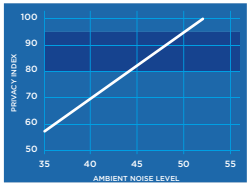
Baffles Ceiling (200mm gap)

Increased screen header
ANL = 48 dB(A)
PI = 89%
Normal Privacy
Air Gap = 3.24m²



Grid Ceiling (50mm gap)

Increased screen header
ANL = 48 dB(A)
PI = 91%
Confidential Privacy
Air Gap = 0.75m²



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

4.2 Pod Lite 3000

4.2 Pod Lite 3000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4.2 Pod Lite 2000

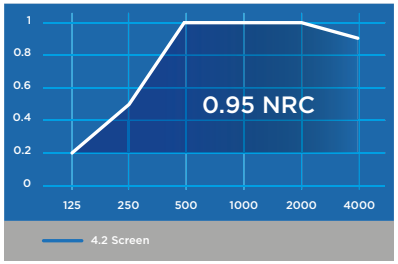
Screen 4.2 Pod Lite 2000 is a range of modular light weight high performance Acoustic screens that can create, within the office, effective acoustic environments for a multitude of uses with a diameter of 2000mm – Pods, meeting rooms, breakout areas and many others.

The design of the walls and the roof system is such that sound reduction and sound absorption is optimised whilst still allowing the free flow of existing air conditioning system.

The system is demountable and can easily be reconfigured and, unlike partitioning, there are no dilapidation costs to consider.

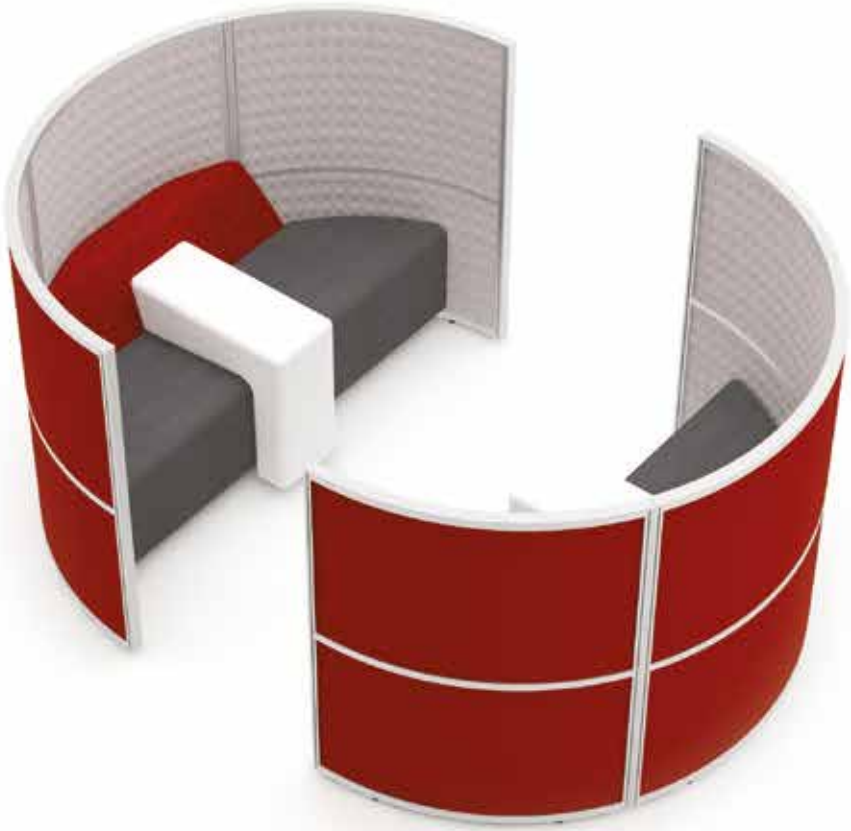
Typical acoustic points
1m x 1m of panel = **10** points
Points score refers to one side of the screen only
For further information on our patented Acoustic Points System see pages 42-45.

Weighted Sound Reduction Index (*R*w) = 28dB
Sound Transmission Class (STC) = 28dB



N.B. A screen with an NRC of 0.95 absorbs 95% of all sound that hits it.

4.2 Pod Lite 2000



4.2 Pod Lite 1600

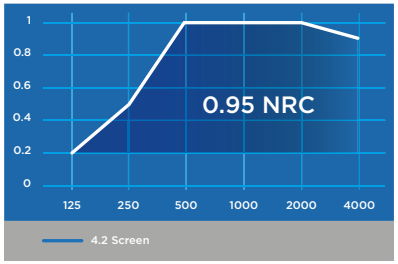
Screen 4.2 Pod Lite 1600 is a range of modular light weight high performance Acoustic screens that can create, within the office, effective acoustic environments for a multitude of uses with a diameter of 1600mm – Pods, meeting rooms, breakout areas and many others.

The design of the walls is such that sound reduction and sound absorption is optimised whilst still allowing the free flow of existing air conditioning system.

The system is demountable and can easily be reconfigured and, unlike partitioning, there are no dilapidation costs to consider.

Typical acoustic points
1m x 1m of panel = **10** points
Points score refers to one side of the screen only
For further information on our patented Acoustic Points System see pages 42-45.

Weighted Sound Reduction Index (*R*w) = 28dB
Sound Transmission Class (STC) = 28dB



N.B. A screen with an NRC of 0.95 absorbs 95% of all sound that hits it.

4.2 Pod Lite 1600

4.2 The Metro Hub

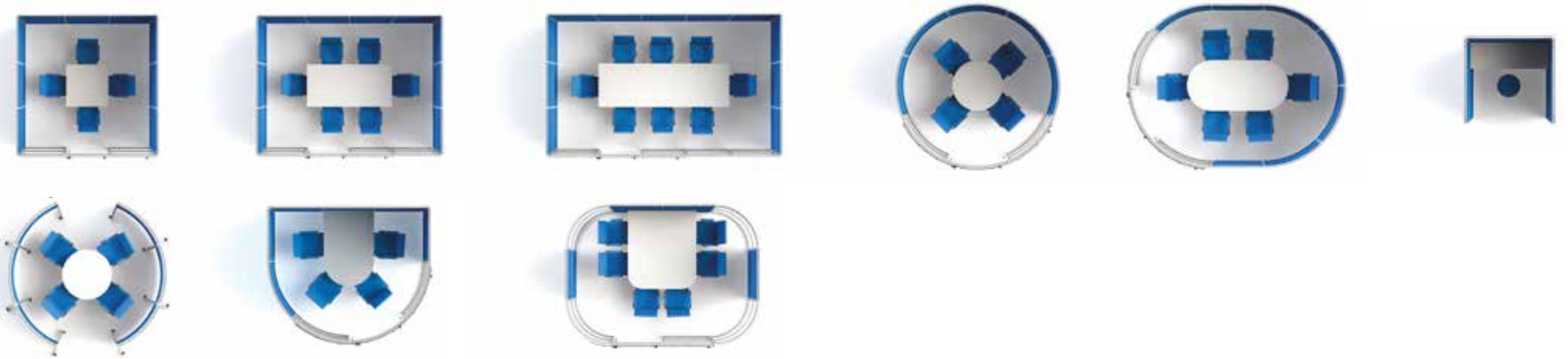
4.2 Acoustic Hub

4.2 Acoustic Hub

4.2 Acoustic Hub

Configurations

4.2 Pod Lite 3000

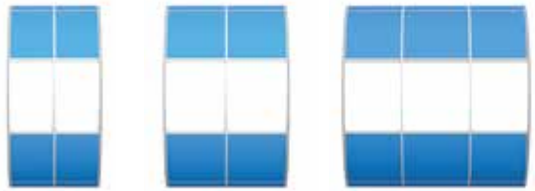


4.2 Pod Lite 2000

4.2 Pod Lite 1600

4.2 Acoustic Hubs

4.2 The Metro Hub



5.2 Pod Tiled

5.2 Pod Glazed

Solving the Problem of Noise in the Workplace

Methods for controlling and solving acoustics problems can be summarised by the acronym ABC:

A – Absorb

Describes the absorption of sound waves by suitable materials.

When sound waves enter a porous absorber, the vibrations of the fibres and air pockets result in energy being lost in the form of heat. This type of absorption must be thick enough to target energy at speech frequencies (at least 20 mm thick). It is important to understand that the placement of absorption on a surface does not affect direct sound (i.e. from the speakers mouth) but will reduce reflections off hard surfaces which lead to decreased speech intelligibility and increased noise levels.

B – Block

Describes the alteration of the sound path using screens, panels, walls etc.

In order to interrupt sound on its path across a room or office, a suitable barrier has to be placed between the source and receiver. The barrier should be suitably dense in order to stop sound travelling through it easily and suitably tall and long to minimise sound travelling over and around it.

C – Cover

Describes the use of a system which produces background sound such as white noise systems and speech privacy systems.

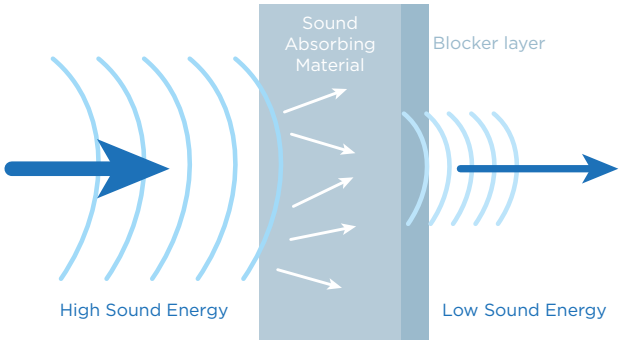
This is the most counterintuitive of the solutions as it involves adding noise to the space in order to make unwanted noise less distracting. Some noise in the working environment, such as steady state noise from air conditioning units, can be advantageous as it provides a useful background to aid speech privacy and hence provides an environment where confidential conversations can be held without being overheard. This acoustic backdrop may also aid in masking the more disturbing, sporadic sounds mentioned above.

The effects of these methods of noise control are addressed in the following sections of this paper.

It is easier to habituate to constant noise than to variable noise. (Kjellberg, Landstrom, Tesarz, Soderberg, & Akerlund, 1996)

A – Absorb: The Effects of Acoustic Absorptive Materials in Improving the Office Acoustic Environment

Acoustic absorption is vital in an office environment to absorb sound and prevent the space from becoming excessively reverberant. The presence of voices in a highly reverberant environment creates a phenomenon referred to as 'the cocktail party effect' (Arons, 1992). This occurs due to the high level of reverberant energy causing an increase in the overall loudness of the ambient noise and affecting speech intelligibility. Speech sounds from the speakers cause a further increase in this noise, causing them to exert greater vocal effort in order to be heard. This has a circular effect in, once again, raising the ambient noise level and decreasing speech intelligibility.



Sound Energy Converted to Heat Energy in Material Structure

Acoustic absorption may be provided by a number of different products, including acoustic ceilings, wall absorbers, absorbing acoustic screens, floor coverings and by chairs and other furniture. Absorptive materials absorb much of the sound that is incident upon them, minimizing the amount of reflection, reducing the amount of reverberation in the space and hence reducing the ambient noise level and improving speech intelligibility. In addition, these lowered ambient noise levels will cause employees in speak at a lower sound level, thereby preventing the occurrence of the cocktail party effect.

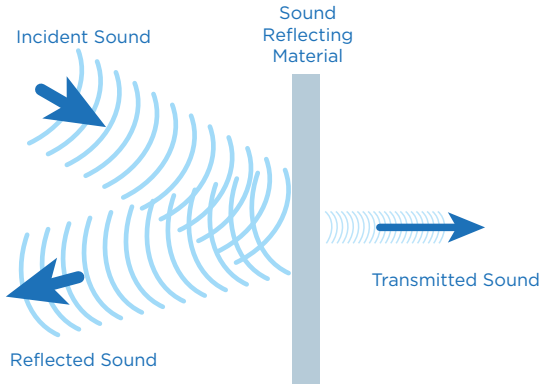
B – Block: The Effects of Acoustic Screens in Improving the Office Acoustic Environment

According to some studies, speech has been found to be the most annoying sound source in open-plan offices. The most distracting speech originates from the nearest workstations. Therefore, speech privacy between workstations should be as high as possible.

Acoustic screens are commonly installed between workstations and can act as a sound barrier as well as providing sound absorption. Screens may also be used as temporary partitions to provide cellular office space.

The screens aid speech privacy by reducing the level of sound transmitted (for example from an operator using a telephone) between workstations or, where screens are used as temporary partitions, to provide a degree of privacy for the occupants of the cellular space.

Research has shown that ***the use of relatively high acoustic screens with suitable blocking and absorbing properties, coupled with a highly absorbent ceiling make the largest difference to acoustic privacy within an open plan office*** (Bradley, 2003).



Angle of Incident = Angle of Reflectance

Solving the Problem of Noise in the Workplace

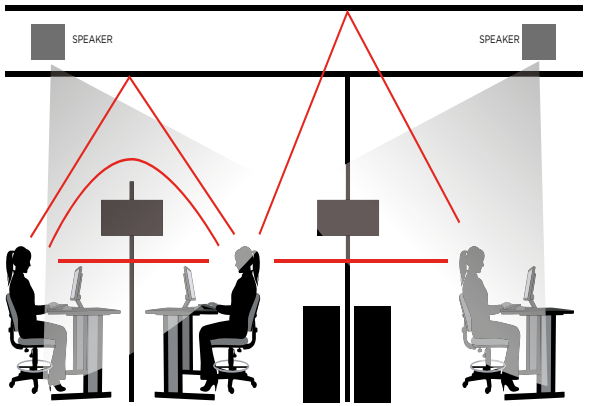
C – Cover: The Effects of Noise Masking Systems in Improving the Office Acoustic Environment

A ceiling manufacturer conducted studies in which the ceiling systems were replaced with absorbent equivalents and sound masking systems. Employees in a number of companies were surveyed prior to and following the works. The workers indicated that ***'freedom from auditory distractions was the most important feature in efficiently and effectively accomplishing their work tasks'. 80 percent of workers believed they would be more productive if their workspace provided more acoustical privacy and in cases where distractions from noise were reduced a 25 percent increase in the perceived quality of the work environment was reported, with a 27 percent reduction in stress and a 20 percent increase in productivity*** (American Society of Interior Designers; Armstrong World Industries, Inc.; DynaSound, Inc.; Milliken and Co.; Steelcase, Inc, 2005).

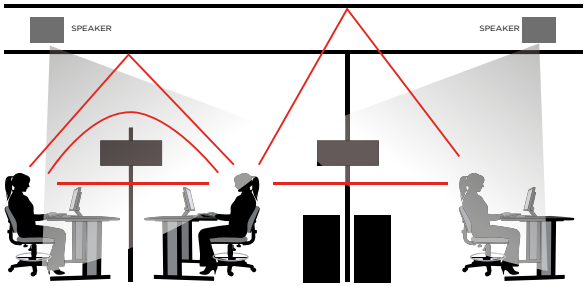
Noise masking systems are commonly used to artificially increase the ambient noise level in a particular area to provide a background noise 'mask' to aid speech privacy. They work by providing a constant, low-level background noise and are particularly suitable for use in areas where confidential conversations are required (such as within meeting rooms) but where the sound insulation between these noise-sensitive areas and the areas outside is not adequate.

Introducing a source of steady ambient noise to the area outside of the sensitive space can significantly improve speech privacy but due to the broadband white noise nature of the sound used does not cause worsening speech intelligibility as "irrelevant speech disrupts memory when task load is high, compared to noise at the same volume" (Evans & Johnson, 2000). In addition, studies have shown that intelligible speech is more distracting than unintelligible speech or sounds with no meaningful context (Sundstrom, Town, Rice, Osborn, & Brill, 1994).

The design of a noise masking system is particularly critical as it effectively introduces a new source of noise into an area which could, if incorrectly designed, provide a source of distraction. Noise masking systems should therefore be designed within the context of each particular space, particularly taking into account the absorptive properties of each area.



OPEN PLAN OFFICES



PRIVATE OFFICES

Conclusions

A review of recent scientific studies has confirmed that ***excessive noise in office environments can be a source of disruption, stress and ultimately a decrease in the productivity to office workers.***

As we progress deeper into a multi-media age it is likely that new technology will introduce new potentially intrusive sources of noise into the office environment. Examples include internal communications via multi-media sources (such as video casts), the use of voice-controlled software and PC hardware, delivery of training by audio/ multimedia and text-to-speech technology, allowing users to listen to their email, reports and other written communications (Ross, 2003). This means that while one may enjoy the acoustics in a particular open-plan office, this may very well change in the near future.

These issues, however, can be mitigated by proper acoustic design to support both individual and team workspace acoustic requirements. ***For the majority of cases, a good acoustic solution will include all components of the ABC.*** In addition, consideration should be given to space planning and layout to ensure that there is no conflict between areas with different acoustic requirements associated with the communication and concentration that forms the main tasks in an office environment.

The acoustic problem is mainly dissatisfaction with speech privacy and intermittent noise. (Jensen, Arens, & Zagreus, 2005)

Analyse your acoustic environment

The Acoustics at Work analysis system offers acoustic 'scoring' of office environments. It allows you to input specific information about an existing office which is then analysed by our Acoustics Specialist.

The acoustic properties of every surface and resulting Reverberation Time of the space are assessed and a report is produced rating your office according to our **Points System**. Each product in our catalogue is worth a specific amount of acoustics points allowing you freedom of choice in the acoustic design of your office.

Until now, assessing the acoustic qualities of any work place has been the job of an expert. It has required an understanding, not only of the acoustic properties of furniture, screens, floors and ceilings, but a thorough grounding in the properties and behaviour of sound.

Yet now, our expertise in acoustic management has allowed us to develop a unique and simple system that offers accurate acoustic 'scoring' of office environments, quickly and easily assessing the Reverberation Time of every space. A design solution is then produced that will allow the creation of acoustically efficient, and therefore, productive working spaces.

1. Noise travels freely.

2. Acoustic furniture to stop direct sound.

3. Sound absorbing materials reduce reverberant noise.

A unique and simple system that offers accurate acoustic ‘scoring’ of office environments.

How the system works

Step 1 - Survey
Our survey system allows you to conduct your own acoustics survey without the need for a specialist consultant. Details and instructions for conducting the survey are given during our full day's training.

Here you learn what is required to conduct the survey, what information is needed, what to look out for and various tips to make this as effortless as possible. Please book your training session to allow you to take advantage of this service.

Acoustics Survey
The survey checklist will assist you in collecting all the data required for the acoustics survey which can then be input to the survey section of our website.

Don't forget...
Each acoustics problem is unique so be sure to get a full description of the problem and outcome expectations.

For complex venues we may conduct the survey ourselves. Contact us with any queries you have.

Only once you have completed the training, will you be able to gain access to the survey utility of the website.

Step 2 - Data Input


Log onto our survey utility using the details provided at your training session


Your details will be saved on our system for future log-ins


Choose from a variety of different room formats, or input details of any other format


Enter details of furniture and people within the room


Input the surface finishes of the room


Enter the dimensions of the room to generate surface areas and volumes

Step 3 - Acoustics Report

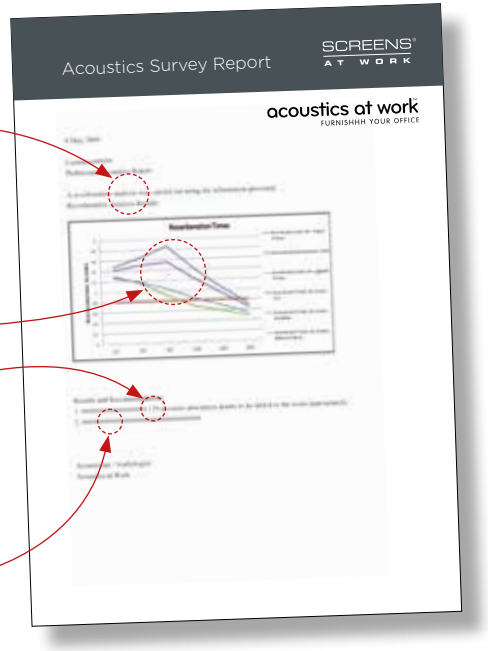
Analysis carried out using the survey data entered via the website

Prediction of reverberation times of unaltered room, and various acoustics solutions

Results converted into an acoustic points score

Recommendations of how to earn acoustic points in order to solve your acoustics problem - based on the needs of the client

Note: The report opposite is an example and individual reports may vary in length and content.



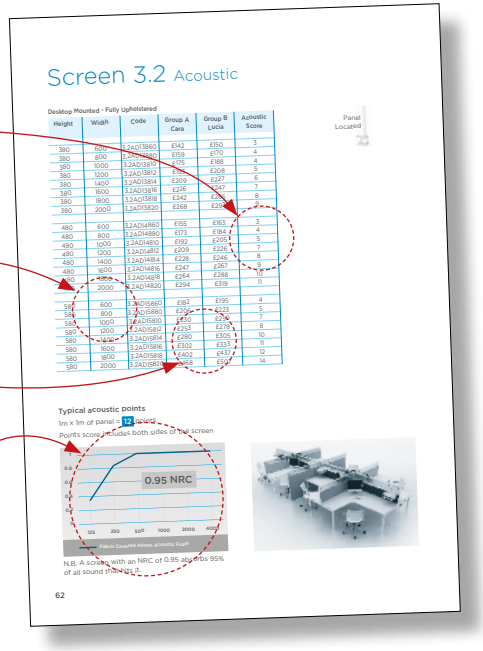
Step 4 - Pricing and Technical Manual

Acoustic Score
Indicates the number of acoustic points you will earn per item.

Dimensions or item description

Pricing of different options

Acoustics data
The graph indicates how the product performs as an acoustic absorber. It will show the sound absorption coefficient.



Masking Systems

The ‘C’ of the ABC of acoustics is possibly the most counter intuitive of all. Covering refers to sound masking which introduces a new noise source into the space in order to make distracting sounds less obvious.

When correctly tuned and installed by an experienced team, a masking system should produce a sound which is non-disruptive and easily ignored – much like the sound of the ocean.

The system produces a uniform broadband sound from loudspeakers which are located within the ceiling void so as not to produce ‘shadow and light’ zones. These loudspeakers are capable of producing sound at noise levels which are powerful enough to penetrate through the ceiling.

Sound masking is suitable for both large and small projects and is a great alternative to reconstructing partitions due to speech privacy problems.

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