

# Acoustics in the office explained.

1st Feb 2012

The reduction of over loud or disturbing sound in the environment and in particular the office environment is normally undertaken by specialist manufacturers and there contractors the approach taken to sound pollution in the office depends on the size of the problem and indeed the budget.

Where the budget is an issue some internet research into the problem would be a good place to start, as often small changes to the office layout can be most beneficial. It is hard to easily describe "sound" and the way it travels but here is a plain English explanation.



Imagine sound as a beam of light, in this case a single light bulb which is in the centre of a table, and the table is in the centre of a six sided room (four walls, a floor and a ceiling) with no windows and a single door.

Now further imagine that there is no other item's of furniture in this room above table height so that when the light is turned on light travels instantly in all directions.

Below the table light does not directly penetrate as the table is in the way, however it's not black down there below the table but only dark. If you turn the light off you would be in total darkness both above and below the table. The reason for this is because the light is being reflected off the walls, floor and ceiling.

Now introduce black velvet to the walls, ceiling & floor and you would have almost total darkness below the table. This is because black velvet absorbs light with very little reflection, and assuming the door is shut no light would escape the room, and that's where sound and light differs for this explanation. Whilst light will not go through solid objects sounds will, in fact solid materials can sometimes help transmit sound.

Most human and office sound is emitted between the heights of 750mm and 1200mm above floor level, being desk and sitting head height, the average of these two heights would be 875mm. A office screen that is 1800mm high would be 925mm above the average sound source where as a 1200mm screen would be 325mm above the sound source, this makes a 1800mm screen on average 3 times more effective than a 1200mm screen.

Sound is reduced by x% per pass through a screen (see percent/decibels screen drawing) the more times sound passes through a screen or screens the greater the noise will be diminished, each pass will be reduced the noise by x%..

The phenomenon known as (*STRETCH*), stretch happens in the intervening space between two surfaces. Double glazing with a small gap between the two panes of glass is great for keeping heat in and cold out but is not great for sound reduction, if you want to reduce sound increase the distance between the two panes of glass, in fact 30cm between two panes of glass will significantly reduce the noise from road traffic through the window even some base noise.

We employ *STRETCH* in Jubilee screens, that is why they are very thick

## A few helpful pointers

- Where budget allows use those hairy carpet floor tiles, they are very effective at non-reflection of sound.
- Rearrange the furniture for maximum effect.
- Arrange office staff so they are back to back rather than facing each other.
- Suspended ceiling tiles made from mineral fibre and having a broken surface are also a very good idea. Not only are the tiles absorbent but suspended ceilings creates a large open void between the tile and ceiling and this in turn creates the dynamic phenomenon known as *STRETCH* (see above).
- If you have large glass areas use curtains, this simple addition can sometime have a dynamic effect.
- Create cubicles with the Jubilee screens as tall as is practicable but not less that 1650mm.
- Use open weave fibrous fabrics where possible.
- Position machines around the outside or at one end of the room with the people towards the middle or other end of the room.
- Where possible have screens positioned up close to machines that are noisy
- Go on the internet, there are many interesting and practical articles about sound pollution.

## To sum up

Stop sound reflecting off hard surfaces by introducing absorbent or non reflecting materials, if this can be done then you are half way there, have the office staff back to back rather than face to face so that sound is travelling away from them rather than travelling to them. Create cubicles around desks with the screens as tall as possible.

Jubilee screens were first introduced in the early 1980's and have been successfully used in countless installation where noise pollution has been a problem. The Jubilee screen range was developed with the help of the Sound Research Laboratory Ltd, Sudbury, Suffolk.

We have over the years installed 10's of thousands of Jubilee acoustic screens, creating quite ECO environments for office staff everywhere.

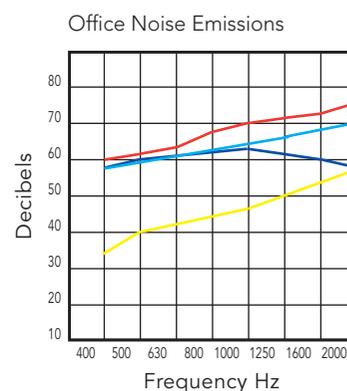
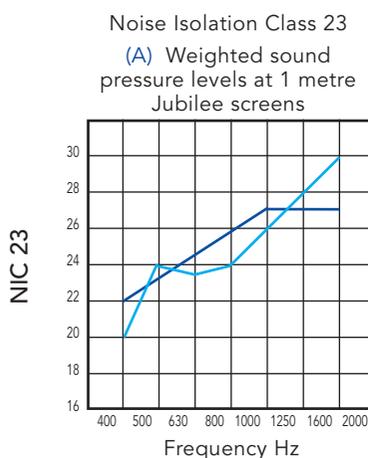
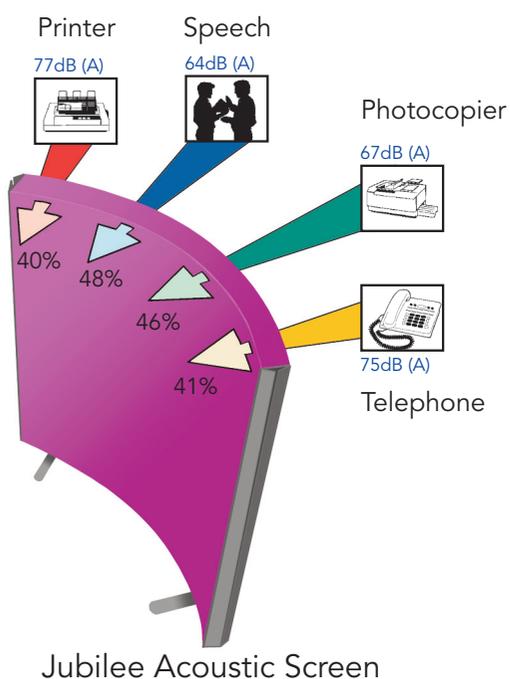
I trust the above quick explanation proves helpful but if you require more detailed information contact your local dealer and explain you needs, we will be happy to assist your dealer with your project in any way we can.

Roger D Payn  
 Managing Director  
 ECO Manufacturing Ltd  
 Ramsey  
 Cambridgeshire

## Jubilee Superior Acoustic Quality

Jubilee range of superior acoustic screens, designed for the main purpose of reducing noise pollution in the office, Strong lines and sound engineering principles plus quality sound reducing materials makes this second generation product truly effective at reducing noise pollution in the office.

Strong – Sound – Effective



ECO Screens