ECHO BARRIER®
Environmentally Sound

H Series Noise Barrier Performance Guide

3 factors must be exactly right to get high performance from Noise Barriers *in practice*.

1. Barrier Geometry

The larger the acoustic shadow, the greater the barrier attenuation…

Barriers are used to block the line of sight between the noise source and the noise sensitive location, creating an "acoustic shadow". The larger the shadow, the greater the attenuation provided by the barrier. In addition, the higher the frequency of the sound, the larger the shadow as low frequencies (throbs, hums etc…) are not so directional and will diffract more round the screen. Consequently, the important principle is that you should place the barrier as close to the noise source as is practical to ensure good performance.

Contact us for advice on your installation options for best performance

2. Barrier Mass

There is a perfect weight for optimum real world performance…

The mass of the solid, impermeable material used as part of barriers determines the drop in noise (or transmission loss) between the two sides of the barrier. The heavier the material, the greater the attenuation - but only provided the barrier is infinitely large! In practice, geometry limits the attenuation as noise passes over the top of the barrier. Consequently, there is a minimum mass required to give high attenuation. Once this is reached, the law of diminishing returns sets-in very rapidly and any additional mass provides no acoustic benefit - but makes transportation, manual handling and fitting much more difficult. This calculation is the basis for the H series Echo Barrier construction. They are designed to hit the "sweet spot", providing the maximum attenuation for the minimum weight in real life applications. Heavier barriers generate much more hassle for a negligible increase in performance, whilst lighter barriers seriously compromise attenuation e.g. a 250gm/m2 barrier would have only 10% of the attenuation. In the few cases where added mass would increase the attenuation, Echo Barriers are designed to be doubled-up locally - a more effective, more convenient and very efficient innovation.

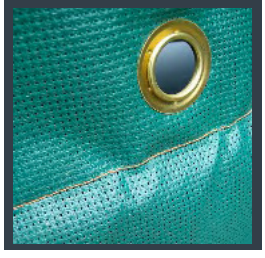
Insulating mass layer

3. Barrier Acoustic Absorption

Barriers without the right thickness of acoustic absorbent can actually increase noise levels…

The solid material in a barrier reflects the noise back towards the noise source. This actually increases the noise level on the source side of the screen. If there are other reflecting surfaces nearby (walls, Portacabins, plant and machinery etc), then this makes the situation even worse by bouncing the noise in all directions. In extreme cases, placing a badly designed barrier in front of a noise source can actually increase the off-site noise! A well designed barrier must incorporate acoustic absorbent material (not rockwool or fibreglass - these generate manual handling issues due to the fibres) on the noise source side to soak-up the sound and minimise reflections. This increases the barrier performance, but adds to the barrier thickness and, conventionally, adds a material that also soaks up water - which also adds mass and mess (water leaks in vehicles and stores, mould etc). Due to the laws of physics, the minimum thickness of absorption required is around 30mm - any thinner and the performance is seriously compromised. Echo Barriers use a specially designed "high tech" tuned absorbent construction that provides high performance without holding water, once again hitting the technical "sweet-spot".

Sound Absorbing Layer



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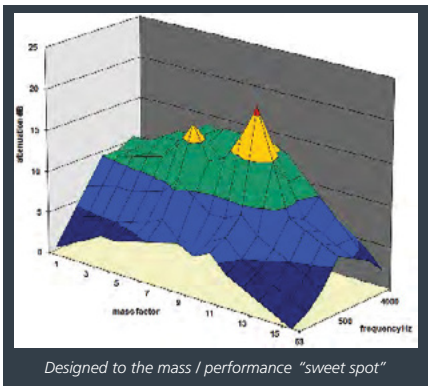
Acoustic Data

A Uniquely Effective Hi-Tech Material Combination

Echo Barriers have been very carefully designed to provide a uniquely high level of performance in practice, on site and not just in lab tests. This has been achieved via a synthesis of acoustic insulation and high tech acoustic absorption materials coupled with a mechanical design that hits the perfect "sweet spot" for maximum performance at minimum weight.

On site, this means lower noise levels, a *70% or more reduction* in fitting time plus easy transport, mechanical handling and storage.



Designed to the mass / performance "sweet spot"

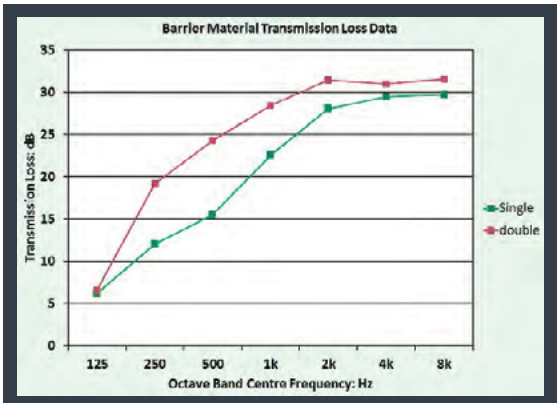
Easy Transport, Handling and Storage

Sound Transmission Loss (TL) - real world data

Up to 32dB TL; *< half the typical weight; field test data….*

The single barrier layer transmission loss data plot* shows the class leading performance of the materials - this is particularly impressive given the light weight of the barriers (5.8kg each - wet or dry compared with the more typical 12 - 15kg…). It is even more impressive when you consider that this is field data. However, note that the field performance of barriers on site is almost invariably determined by the installed geometry. In the rare cases where geometry is not the determining factor, Echo Barriers are uniquely designed to allow for a second layer to be very easily added local to the source, increasing the attenuation by a factor of up to six times.

**Field test data: measured insertion loss of barriers, 1m source/receiver, 4m in front of reflecting surface, natural leakage paths. Lab test T. Loss data to BS EN 717 / 345 / 2750 is misleading as these tests are not designed to measure the performance of barriers as fitted. They test the* TL of an artificially sealed material sample in a concrete test chamber.



Barrier Material Transmission Loss Field Data - dB

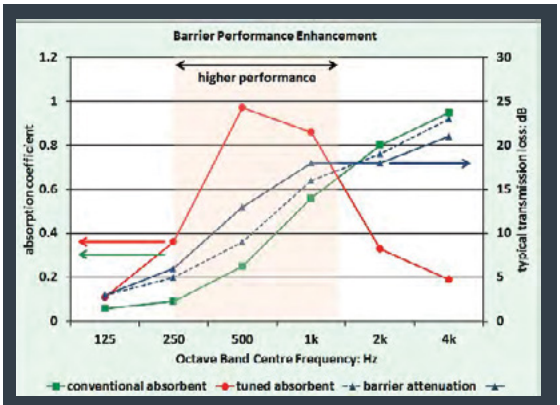
Hz	125	250	500	1k	2k	4k	8k
single	6	12	16	23	28	30	30
double	7	19	24	28	32	31	32

Unique Tuned Acoustic Absorption

Soaks up to 100% of the sound without soaking up water

The high tech acoustic absorbent composite has been designed and tuned to provide high absorption over the key 250Hz - 1kHz frequency range to maximise the field performance of the barriers. It also avoids the fibre shedding / mechanical handling safety problems associated with traditional fibre materials.

Conventional absorbent materials soak up rainwater. This substantially increases the weight of the barriers, creating handling issues and a host of the other practical problems that are associated with pools of water inside vehicles and storage areas. A unique feature of the Echo Barriers is that their class leading performance has been achieved without retaining water, so no weight increase and no mess.



Absorption coefficient of 1 = 100% efficiency