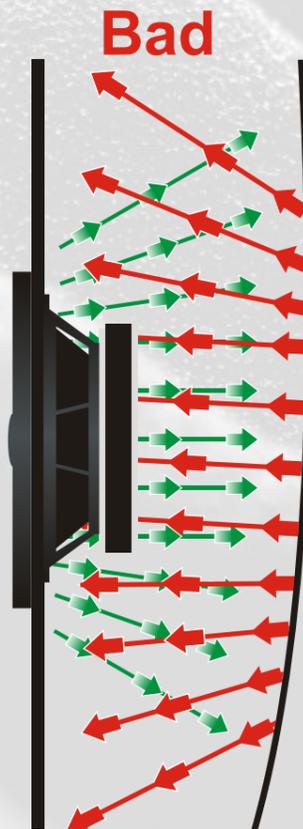


Diffusing An Audio Bomb

Skinz Wave Diffuser is a fascinating product. Looking more like a sound absorber than a diffuser, in practice it performs both jobs to an extent. But how does it save us from poor sound?

A speaker produces sound by moving air. A cone vibrates at various frequencies and throws air forward.....and backwards. Herein lies the problem that led to the development of Skinz Wave Diffuser. The issue is that the sound or air movement produced from the rear of a speaker can reflect from solid surfaces behind and affect the movement of the air from the front as well as distorting the cone shape. In a car, speakers are generally mounted in the doors. The rear of the speaker sits very close to the metal door panel and so reflections are strong and prevalent. Such reflections can cause many problems with the resultant sound in the vehicle interior. Frequencies will literally bounce back from the door panels and hit the rear of the speaker cone compromising the frequencies being sent out from the front. Furthermore, these so-called back waves will find other routes back into the cabin causing further problems with cancellation and phase. In real audio terms the effects are many and varied as there is no coherent correlation between the reflections and the new sound emanating at the time they reach the cone. They include phase issues and frequency colouration and probably most discernibly, level.

No one wants to get less out of their speakers than they put in and so it makes perfect sense to take measures to reduce the effects mentioned. Wave Diffuser is a most effective way of doing this. Looking more like a sound absorber than a diffuser, the foam is sculpted into an egg box profile and actually does both jobs to an extent. The soft open cell foam will absorb much of the sound from the rear of the speaker as well as breaking up the wave pattern to disperse its energy and scatter it. The metal in the door should already be soundproofed using Skinz Sound Deadening. This actually makes the problem with reflections worse, as it adds much needed rigidity to the metal. However, sound deadening is there for a different yet equally important reason. Sound deadening reduces the noise passing through the door offering the double benefit of reducing outside noise and protecting the neighbours from the music inside the vehicle when you arrive home! Home hi-fi speaker boffins will advise caution when stuffing enclosures with different materials. Most limit themselves to a small



“No one wants to get less out of their speakers than they put in”



Skinz 3mm Expert

amount of lightweight material. This tends to calm some issues in the mid/high frequencies whereas adding something heavier will reduce bass performance. This is not the case in car doors as these can rarely be described as tuned enclosures. In a standard installation, car speakers run “free air” and therefore the volume of the cabinet is irrelevant. We know through measurement that wave diffuser helps speakers to project more of their output into the vehicle while the reduction in reflected “back waves” reduces any degradation of all-important mid-range and high frequencies. If bass is a big aim, then we would always recommend using a subwoofer. This will help protect against swamping where heavy bass reduces clarity in the lower mid-range. While on this subject, wave diffuser will have less of an effect on low bass as those frequencies tend to pass straight through most substances (including concrete!) rather than being reflected anyway. The absorption coefficient of Wave Diffuser rises with frequency where audible phase discrepancies and cancelling will become more pronounced.

The product itself is made from open cell polyether polyurethane. The whole surface is treated with a water-based substance in order to achieve a Class 0 flammability rating. This is far higher than the rating used on internal home furnishings. Wave Diffuser is very flexible making it ideal for use behind car speakers where the surface to be treated has a complex topography.

We have not had the opportunity to directly AB test or measure the effects of Wave Diffuser but it is fairly easy to hear the difference in projection and clarity without the need for a real time analyser.

Wave Diffuser sits alongside a suite of deadening and damping products from Skinz. These include two thicknesses of a bituminous-like material constructed from butyl rubber and a visco elastic polymer (3mm and 2mm). This “go to” deadening product is great for reducing external road noise and creating a more solid basis for the mounting of speakers. In recent years there has been a dramatic increase in its use due to the proliferation of leisure vans being purchased. 3mm is recommended for door panels but other panels including the roof can be lined with the thinner and therefore more lightweight 2mm version. Skinz also produce two thicknesses of panel liner. This is used on internal panels such as door cards or internal metal structure to further quieten a vehicle. A bonnet liner completes the range.

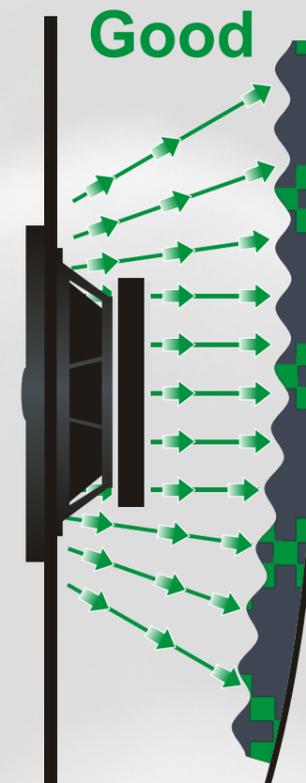
When upgrading your vehicle's audio system, some kind of sound treatment is always necessary!

To find out more visit www.fourcaraudio.co.uk



Fitted Wave Diffuser

SKINZ



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