Home Theater Acoustics

Creating the magic of a real movie theater at home

AUDISEE

GET INTO THE MOVIE

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A home theater is a major investment, and yet expensive electronics alone cannot buy you a great movie experience. The acoustics of a room is a vital component of a home theater system. Infact, an excellent system in an untreated room will have poorer sound quality than an average system in a treated room. Even with extremely high-end gear, you can't achieve optimum audio performance without paying attention to the acoustics. Experts say, the speaker system and electronics contribute only 40 percent to your system's overall sonics—with the room responsible for the other 60 percent. These days enormous effort goes into the sound production of films to make the dialogue intelligible and to enhance the dramatic impact of the movie. Yet how many times have you been viewing a film and find the dialogue difficult to understand or the background music overwhelming? This is due to the lack of proper acoustics in your home theater.Untreated rooms have their own distorted sonic signature and are never acoustically correct. There may be sound bouncing around the room, changes in tonality and bass energy, certain consonant and vowel sounds in words may be squashed or amplified, etc. Also noises from outside the room may seep into the theater and theater sound may escape to disturb neighbouring rooms.Audisee can customize an acoustical environment that will eliminate distracting noises and allow the articulation and intelligibility of the movie sound track to be clean, crisp and balanced.

The current scenario

So far in the Indian home entertainment industry most professional and consumer alike don't have the right understanding of room acoustics. There is a huge misunderstanding between sound control (acoustic treatment) and sound isolation (sound proofing). The current scenario in the market is quite surprising as the so called professionals in the market are exploiting consumers because of their lack of knowledge. Customers are sold an acoustic solution under the impression that they will achieve sound isolation and sound control, where the theater will sound great and no sound will leak through. However, neither of this is achieved, the room is over damped and sounds life less also the sound isolation is poor.

The problem that we see in all home theaters where we carryout a correction project is that, all walls are stuffed with fuzzy materials like Polyfill, Glass Wool, etc, these kill essential sonic energy that is required to create a good home theater experience and their sound isolation is also very poor as the bass is not isolated at all. A good home theater should have adequate sound isolation and sound control to get the best sonic character required to achieve a cinema like feel.

Sound Isolation- Silence is Gold

Sound Isolation is considered advanced acoustic treatment and is required to achieve stellar acoustics inside the room. The reasoning is simple: it's easier to shape up the sound inside your home theater if outside noise is kept exactly where it belongs: outside! Isolating your theater room from sound coming from the outdoors, your neighbors, and other rooms in your home will give you an untainted perspective of how your audio system should sound. Sound Isolation makes the room quite by isolating sound from outside entering the room and vice versa. At Audisee we isolate sound by doing a room inside room construction where we decouple the walls, floor, and ceiling with shock mounts, by doing this we are able to isolate the entire spectrum of sound including the low frequency. This also improves the bass by reducing the effect of standing waves and room modes inside the room.

Sound Control

It is important to first understand that acoustic treatment is meant to control the sound quality within a room, it is not intended to reduce the amount of sound that travels between rooms. Sound can be controlled only by using acoustical panels, their function is to control the level of reverberation in the room. In home theaters sound control is the art of controlling the sonic character of a given space to mimic a reference grade movie theater. To achieve this you have to understand the sonic character of the room, what sonic artifacts are created by the physical structure of the room and how the movables (furnitures) in the room are going to effect the sound quality. Unlike acoustics used in large spaces like commercial theater and concert halls, small room acoustics are completely different as the rooms acoustical properties are different. At Audisee we design and customize acoustical treatments to achieve the best possible sound in a given space.

Defining Sound Quality

To understand good sound quality let's start by knowing what bad sounds are :

- **Unintelligible dialogue and poor music reproduction**
- **Lack of focus- cannot pin point the location,size of sound on a 360 field**
- **Poor seat to seat uniformity**
- **Two dimensional sound stage only**
- **Abrasive table**
- **Poor dynamics - caused by excessive ambient noise**
- **Ringing bass**
- **Localizable spealers - lack of continuous 360 degree sound field and lack of depth in the sound field**

Any one or a combination of these attributes will lead to bad sound quality.

Absorptive panels

(Broadband Absorbers)

Strong reflections are the first locations where sound reflects between your ears and the speakers. When treating a room, these reflections are treated with absorption. Installation of treatments on these locations can be dramatically beneficial to a home theater installation by improving clarity and focus. Absorbers also help in reducing the reverb time of the room resulting in clearer dialogue. To understand words in a dialogue consonants play a crucial role. Generally, consonants in a word have duration of about 65 msec only and they determine the meaning of words and influence dialogue intelligibility. Absorbers reduce the reverb time of a room there by improving dialogue intelligibility and tonal balance.

At Audisee we design Broad Band Absorbers which can go as low as 350 Hz, unlike other panels available in the market that go only as low as 1 kHz and are more suitable for conference rooms where only vocals are present. By using these Audisee's panels at the right location we can achieve better clarity & focus.

Acoustic Services at Audisee

Treat your room right, and it'll treat you the same.

At Audisee, unlike other acoustical treatment products, we tailor make an acoustical solution specifically for your home theater or listening room. You can always be assured that when you get acoustic services from Audisee you are getting the perfect solution for your individual room.

Audisee's design approach takes into account your room's configuration, dimensions, construction, decor and placement - anything that could obstruct the discerning listener from experiencing the ultimate in sound clarity and richness. Whether your A/V equipment investment is large or modest, professionally engineered acoustical treatment can dramatically enhance your listening experience.

Acoustic Treatment within a room is designed to react with sound to accomplish one or all of the following three things: absorption, reflection or diffusion. Absorption is used to absorb unwanted reflections from the front speakers off walls and ceilings. This often causes audible echo, frequency changes or a smearing of the movies dialog. Reflective and Diffusive elements act as reflectors to sound waves coming from speakers in the surround field. In general, a fine balance of these three elements is required to create the best sound in your theater.

Bass trap

Long reverberation time at low frequencies cause poor bass clarity. Bass traps pick up where acoustic panels, drapes and squishy furniture leave off: they absorb renegade bass frequencies that would otherwise bounce around your home theater and make the overall sound quality muddy. Low frequecy sound (bass) has longer wavelengths, and is thus more susceptible to piling up in some areas of the room and canceling itself out in others. This can produce uneven bass from one seating location to another. This is especially true in small rooms, like the size of most home theaters. Audisee's bass traps are designed to reduce this type of problem, we use them in two or more corners to even out your bass.

Diffuser

Most people only hear about "absorption" requirements for a home theater, but a fully treated room where acoustics are completely controlled will contain both elements to allow for a more immersive movie watching experience. Diffusion causes sounds to uniformly bounce around the room. The surround sound channels should not be precisely localizable, unlike the front left, center, and right channels. The surround channels create an ambience that puts you in the center of the movie. Diffusers improve envelopment using the surround field to create a more immersive experience for the listener. Not only does diffusion make surround sound better, it evens out the reverberation in your room, making sounds decay cleanly and uniformly. Diffusers are hard surfaced acoustical treatments with either irregular surfaces that break up and scatter sound waves in multiple directions, or convex curved surfaces to gently split frequencies and deflect them in multiple directions. They are intended for sound waves to impact, reflect & diffuse the sound rather than absorb the sound back into the room. At Audisee we make two types of 2D (two dimensional) diffusers QRD (Quadratic Residue Diffuser) and Poly cylindrical, and also 3D (three dimensional) skyline diffusers.

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