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SON & IMAGE

Sound Momentum Diffuser Panels

Aesthetics, functionality and performance

JEAN LAPORTE

In our modern world of multiple architectural styles and forms, it is quite rare to be able to avail oneself of a dedicated listening room of ideal acoustic dimensions. The inevitable result is often a listening situation far from the ideal: a sofa against a wall, a non-symmetrical room, light and inadequate building materials, etc. Faced with these myriad problems, manufacturers have responded with acoustic products that deal with a number of issues, such as early reflections and overall reverberation time, and even mitigation to some extent of the sonic signature, or rather (dare I say) the despicable "song of the drywall" omnipresent in our buildings (a problem discussed in a previous article on acoustics).

Among the various solutions proposed, we are pleased to review a new homegrown product, the **Sound Momentum diffuser panels**, a design that merits our attention for its originality, aesthetics and acoustic benefits.

DESCRIPTION

The diffuser panels under review measure 23 by 23 inches and can be installed either on suspended ceilings, directly on walls or on specially designed feet. The panels are available in natural poplar, which can be painted or stained as desired. The finished version features an attractive two-tone pattern torrefied poplar, protected with a natural oil finish. Both models are equipped with a single-point anchor system. Adjustable stands are also available.

Note that both the natural and the two-tone versions won us over with the attention to detail in the finishing, their aesthetics and their flexibility of installation. In

these aspects, these new diffusers stand out from the pack.

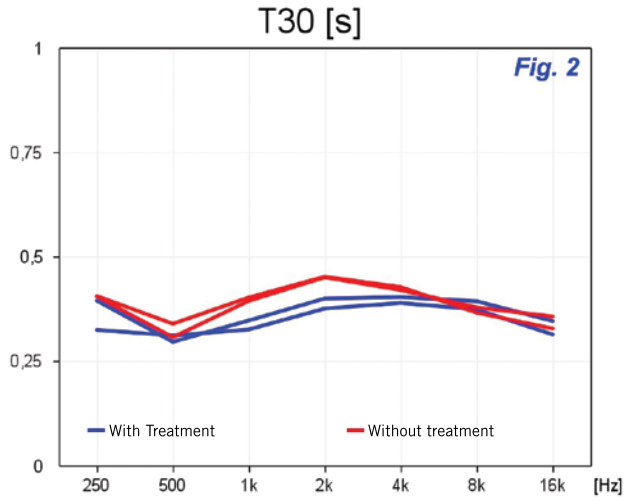
The diffuser panels are the work of Jean Leclerc, founder of the Sound Momentum company, and are based on a classic diffusion approach based on Schroeder's formula and its application in three dimensions. While other manufacturers also apply this approach to their diffusers, the originality of the **Sound Momentum** design lies in the combination of Schroeders' formula with - in the words of the designer - the principle of "polycyclonal" diffusion. Simply stated, such a panel uses convex surfaces to provide a more complex and continuous diffusion pattern. But any comparison stops there because Jean Leclerc's panel is neither a variant of the Helmholtz resonator nor a panel that works only in two dimensions. Mr. Leclerc has developed a novel approach in which he varies the depth of each section with both a curve on one side and a different orientation from one section to the other. The orientation and the curves confer unique properties to the panel.

Another original aspect of this new diffuser lies in the fact that it is built of solid hardwood. This feature provides the diffuser with better vibratory inertia: the mass is more resistant to internal resonances inherent in any light construction that is struck by sound waves. This mass also helps to redistribute sound energy in the room without excessive absorption, distortion or unnatural coloration, such as the dreaded "song of the drywall" previously mentioned.

These diffusion characteristics, combined with the discretion of wood sound and internal inertia combine to counter several negative effects in the listening room. The expected results are a decrease of drywall resonance, and the breaking up of standing waves in the mid and high frequencies, all without excessive absorption or distortion of the reflected sound wave. These beneficial effects, valuable in themselves, are particularly appropriate when the listening position is near the back wall. The level of drywall resonances in this area is significantly greater due to the proximity of the wall. The ears receive more of the resonance at this position but also those of the waves reflected between the head and the wall. Obviously, in specially treated rooms, the drywall resonance effect will usually be better controlled through complex assemblies of different materials. But this does not remove the increased sound pressure due to the proximity of the wall, nor the negative effects of early reflections. As a final contribution to the acoustics of a listening room, note that these panels mitigate global reverb time in the mid and high frequencies.

ANALYSIS OF RESULTS

As the experiment has clearly demonstrated (see recording and graph) the Sound Momentum diffuser panels exhibit a convincing performance by reducing and breaking up medium and high frequency sound waves. We can see this

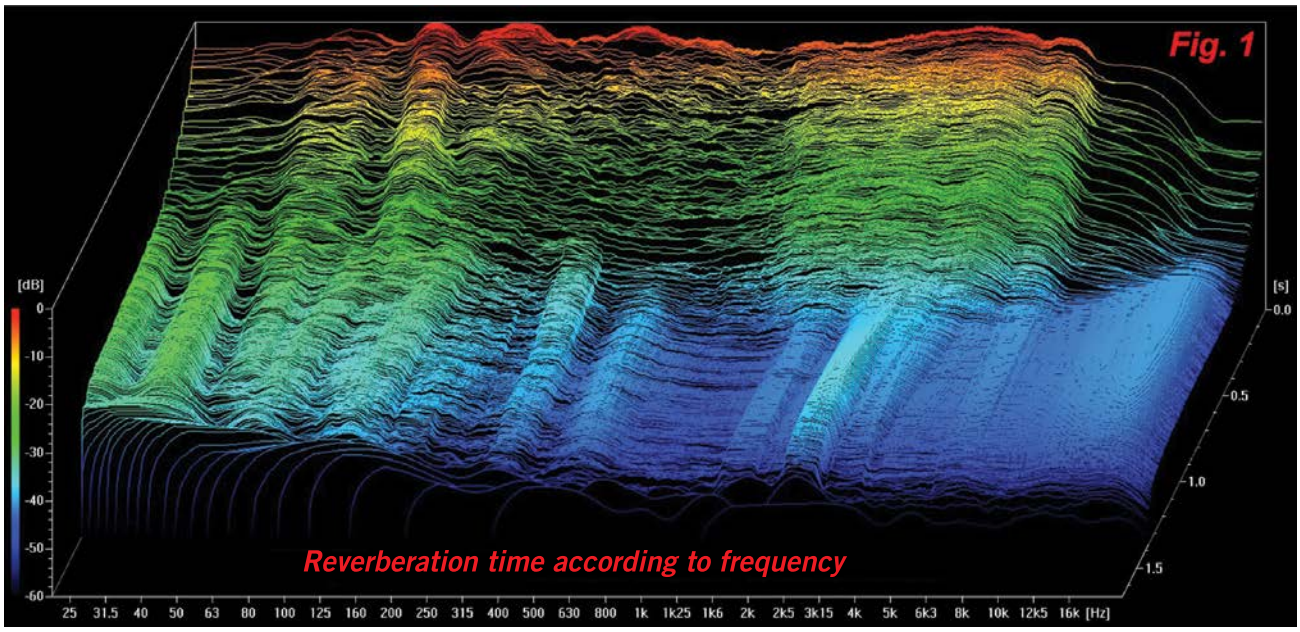


influence in the chart comparing reverberation time with and without the panel in place. The panel is effective, but the room becomes too dull or over treated, when compared to international standards. Yet when we look at the clarity index, definition, spatiality, and the inter-aural cross correlation (IACC), all of these indices are improved, meaning that the acoustic treatment improves the quality of the room. Why then does listening give the impression of an over-treated room, that the sound is less spacious and less clear? Simply because this treatment, while technically correct, was not combined with readjustments elsewhere in the room or with the speakers. As an analogy, the diffuser's role is a bit like that of a cable change in an audio system, which can result in an imbalance, unless there is a corresponding readjustment of the rest of the system to restore balance.

CONCLUSION

Acoustic treatment with diffusers, like any significant change in your audio system, modifies an important variable of your room's acoustics by increasing transparency and neutrality. Depending on the situation, the change can unbalance the sound, or it can represent the ideal solution so dearly sought. Nevertheless, its application requires judgment against benchmarks and may require careful readjustment of the rest of the system to ensure that in the overall rebalancing, the desired gain in sound quality is obtained. Also, while being super efficient, functional and particularly aesthetic, these wonderful panels require careful setup to obtain their ultimate performance. Clearly, simply having the best ingredients at hand doesn't guarantee the best cake! Rest assured though, that in all cases this ingredient is necessary, even essential, when you have room conditions that are less than ideal. For a few hundred dollars, you can definitely maximize your considerable investment in your sound system, because, as is always the case, the room is inseparable from the acoustic performance.

AS THE EXPERIMENT HAS CLEARLY DEMONSTRATED THE SOUND MOMENTUM DIFFUSER PANELS EXHIBIT A CONVINCING PERFORMANCE BY REDUCING AND BREAKING UP MEDIUM AND HIGH FREQUENCY SOUND WAVES.



Thank to Sonor•Filtronique Montréal boutique to have put their their listening room and audio equipment available for the test.

Sound Momentum Diffuser Panels
Price (for the 23 x 23 inch model):
$425.00 (select natural poplar)
$500.00 (select northern cherry)
Sound Momentum
514.773.3550 • www.soundmomentum.com