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COMFORT. PRIVACY. INTELLIGIBILITY.

THE REAL DEAL ON ACOUSTICS AND WALLS

Why FSTC is more important than STC

Sound transmission class or STC, measures how well a wall or partition prevents sound or rather speech from transmitting to the other side of this same wall or partition and is represented by a single number that rates the blocking properties of a wall or partition.

However, this single number is limited due to the fact that the ASTM test for STC only includes frequencies from 125 Hz to 4000 Hz and does not include a large portion of the audible spectrum. In addition, the formulation of an STC value can result in two or more walls containing the exact same STC rating, but the walls may have very different performance characteristics. For example, two walls may have an STC of 38 but one wall blocks sound better in the low frequencies than the other wall that is also rated at STC 38. This can occur due to weighting during the formulation process and can result in skewed performance.

STC is measured in a laboratory under specific controlled conditions for sound and construction. However, these similar conditions are rarely achieved in actual interior building construction as normal space often contains many flanking paths, wall and ceiling penetrations, in addition to other construction openings. These "normal" conditions ultimately decrease a wall's perceived and actual acoustical blocking properties. Consequently, in field application, or use, results in the actual STC performance, or more properly described, the field STC (FSTC) measurement can be six to ten plus points lower than the laboratory published STC value. Therefore, it is important to not only look at laboratory STC values but to also understand their real limitations.

The FSTC or Field Sound Transmission Class values are often considered by acoustic professionals to be a more important criterion than widely published STC values when understanding the field performance for the blocking properties of interior wall and partition space. The difference between the laboratory STC and the FSTC ratings stem from the overall effect of actual construction that contains many flanking paths, openings and penetrations. It is important to note, that regardless of what STC is ultimately selected, it is critical to control and seal all air-gaps, penetrations and deal with flanking paths for sound. Failure to do so can significantly degrade sound blocking capability.

FSTC is a measurement that utilizes the measurement and function of actual background noise levels, room volumes, surface areas, sound absorption values and spectral content of the sound source. FSTC testing is done in such a way as to limit the extraneous factors that affect the value rating for the partition in order to arrive at a value that truly represents the partition's performance. The FSTC calculation provides a better understanding of the actual performance measurement rather than the acoustical lab value that the STC represents. Contact your local acoustical engineer to help you with obtaining good FSTC measurements or visit ASA.org or NCAC.org to find an acoustical engineer in your territory.

Lencore sound masking is one element that can be added to the environment that will improve overall acoustical performance and comfort as well as add the performance equivalent of 10 points of STC value to the treated area. The simple diagrams that follow can explain how sound masking improves the acoustical performance of your spaces in more detail.

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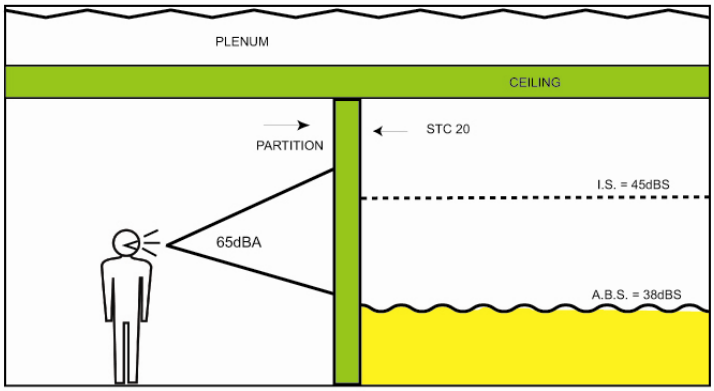


No Masking

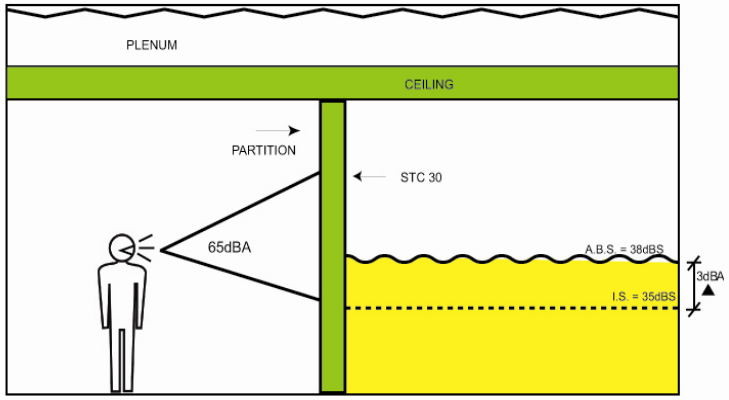
LEGEND

N.A.B.S. = New Ambient Background Sound
I.S. = Incoming Speech
A.B.S. = Ambient Background Sound

In this example and using a typical partition with a rating of STC 20, we see that the incoming voice measured on the other side of this partition is at 45dBA (65dBA (Normal Speech Effort) – 20STC (Wall) results in incoming speech of 45dBA). Since the speaker's speech even after reaching the other side of the partition is still at 45dBA and the background sound is still 38dBA, the speech or sound would be intelligible. Here, there would be no speech privacy using the partition with STC 20 and no sound masking because the person can be clearly understood on the other side of the partition.

In this example, the partition's STC has been increased to an STC 30. If we measure the level of the incoming speech (voice) on the other side of the partition, we will get a measurement of 35dBA (65dBA – 30STC gives us 35dBA). Here the speaker's speech is reaching the other side of the partition at 35dBA and the background sound is 38dBA. In this case, the speech would be unintelligible since the background sound is 3dBA above the incoming speech. So in this example, using a partition with an STC of 30 you could obtain speech privacy. The dynamic range here or the difference between the background sound level and incoming speech is 3dBA.

Note: Please note that there may be significant construction costs associated with increasing all partitions from STC 20 to STC 30.



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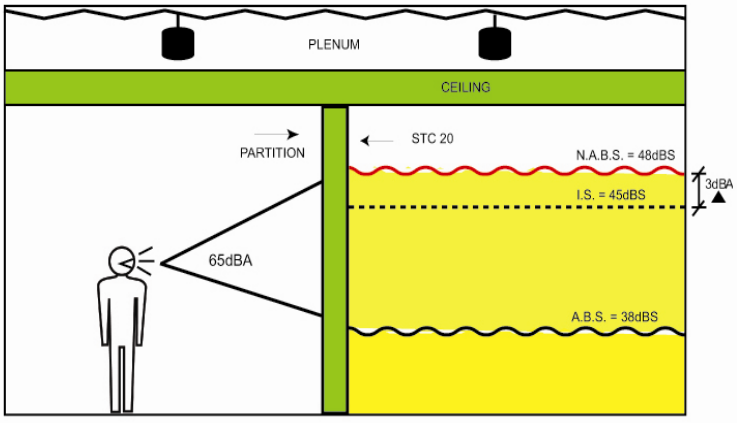

With Masking

LEGEND

N.A.B.S. = New Ambient Background Sound
I.S. = Incoming Speech
A.B.S. = Ambient Background Sound

Using this example, with the STC 20 rated partition, we see that incoming speech measured on the other side of this partition is at 45dBA (65dBA – 20STC gives us 45dBA). But since we have introduced sound masking and have effectively raised the background sound level to 48dBA, the speech level of the speaker when measured on the other side of the partition falls just below this level or at 45dBA. It is covering over the incoming speech. The dynamic range here or the difference between the background sound level and incoming speech is 3dBA. Here speech would again be unintelligible. These examples show that by adding sound masking you can obtain similar results as increasing the STC rating of the partition. Sound masking is an economical and better way of attaining speech privacy and the best way to provide acoustical comfort.

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