What is STC?

STC, which stands for Sound Transmission Class, is the most recognized and discussed sound isolation term in Australia. You have almost certainly heard it many times. In this article, we will discuss STC, what it is and more importantly, what it isn't.

So what is STC?

Does STC stand for how many decibels of sound a wall stops? No, it doesn't. It is a method for ranking walls for sound isolation over the frequency range of 125-4000 Hz assuming that the noise you are trying to contain has a flat magnitude across that frequency range.

Assuming those two conditions are met – the noise source is flat, and there is no noise below 125 Hz – STC is a very good method for ranking walls. However, the vast majority of real world situations don't resemble those conditions at all.

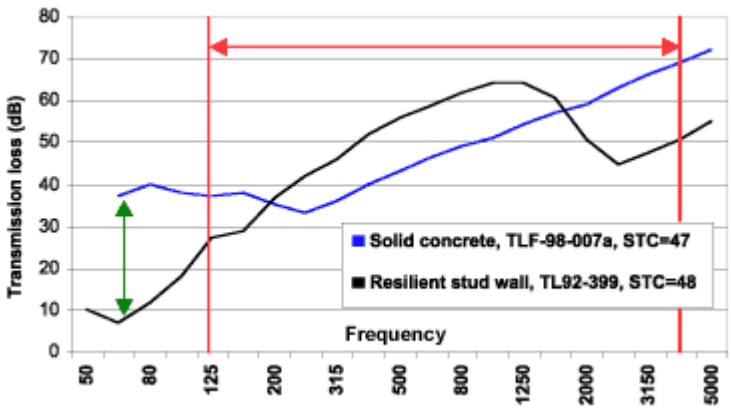
Now we'll take a more in depth look at the problems that these two assumptions lead to, and how misleading the STC rating can be at times.

STC ignores low frequency performance completely.

It was mentioned above that most real world noise sources aren't flat, and have considerable low frequency content. Home cinema's, for example, typically have MOST of their sonic energy below 125 Hz. As such, STC ignores the most important part of the cinema frequency spectrum.

How misleading can this 125 Hz cutoff be? After all, surely a wall with higher STC also has higher low frequency performance! Well no, and in fact the opposite is often true. The graph below shows a dramatic example from actual lab tests run at the NRC in Canada.

Chart – STC has no correlation to low frequency performance.



This graph shows "transmission loss" – the subject of the previous sound isolation tip.

If you missed that tip, transmission loss, or TL, is how many decibels of sound a wall stops at a given frequency. Higher is better in these graphs.

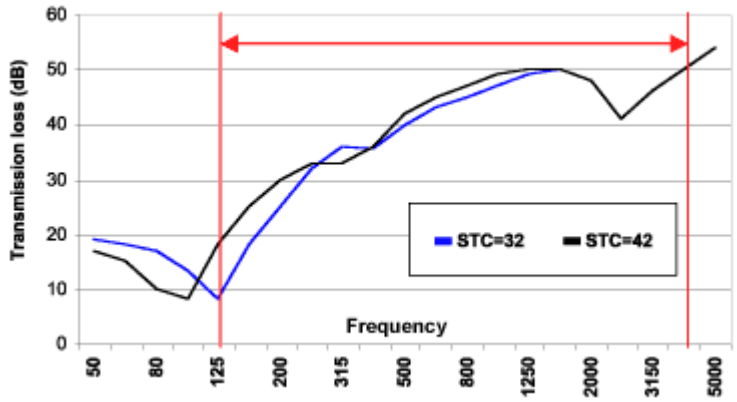
The **red** arrows show the frequencies considered by STC. The rest are ignored.

Similar STC, but in this case the wall with higher STC has nearly 30 dB worse performance at some frequencies below 125 Hz. This fact alone – the fact that STC ignores low frequency performance – is enough to justify ignoring STC as a measure of cinema wall performance.

Misleading results due to frequency cutoff.

The sudden cutoff at 125 Hz also leads to misleading results in another way, as this chart shows.

Chart - frequency cutoff leads to many misleading results



The two hypothetical walls shown above are nearly identical in performance, and both are poor performing walls. Yet one wall gets a bad STC score – 32 – while the other gets a reasonably respectable STC score of 42. Why? Because the **blue** wall has a bad resonance problem at 125 Hz, inside the STC frequency range, and this hurts the STC score. The **black** wall has the same relative problem, but it occurs just below the STC frequency range, and therefore does not enter into the STC calculation.

So what should you do?

You should strive to avoid making plans based on "high STC," and strive to find products and designs that yield reductions in actual real-world noise level. Review transmission loss data as far below 125 Hz as you can find.

It is very important to note that to compare performance below 125 Hz, you must look at data taken in the same way, and in the same lab, as lab to lab differences below 125 Hz tend to be very large. A prudent manufacturer will be able to supply you with this data upon request.

Reference: www.audioalloy.com

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