Acoustical Surfaces, Inc.

SOUNDPROOFING, ACOUSTICS, NOISE & VIBRATION CONTROL SPECIALISTS

123 Columbia Court North • Suite 201 • Chaska, MN 55318
(952) 448-5300 • Fax (952) 448-2613 • (800) 448-0121
Email: sales@acousticalsurfaces.com
Visit our Website: www.acousticalsurfaces.com

We Identify and S.T.O.P. Your Noise Problem

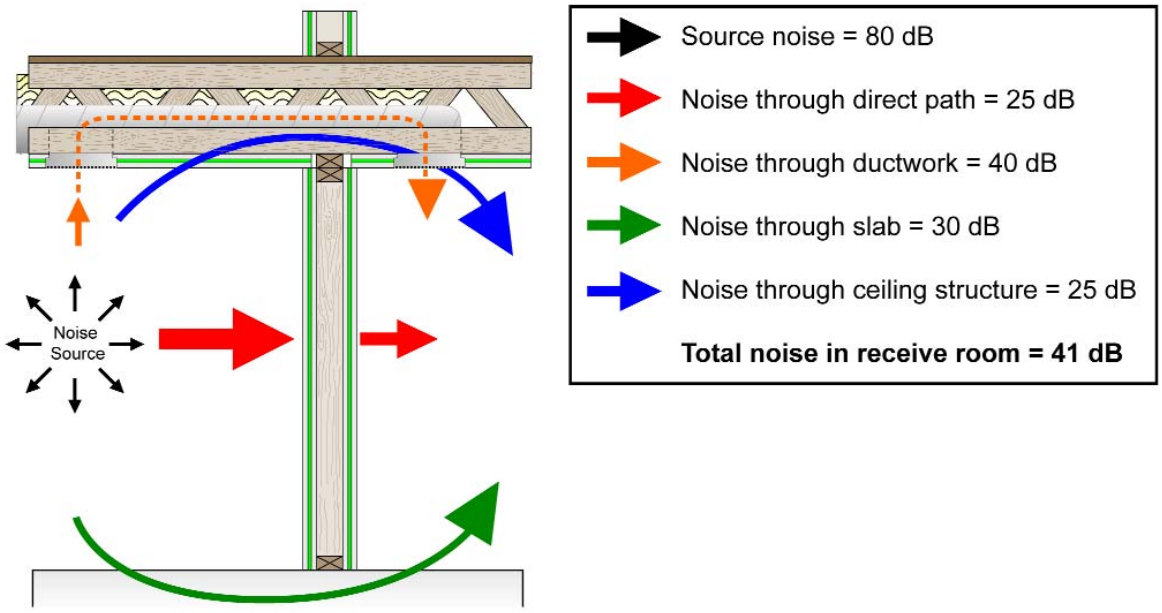
The impact of Green Glue on structure-borne sound

Vibrations can take several paths to compromise acoustic isolation.

Green Glue is a damping material, its purpose is to raise the damping of structures in which it is included. The literal definition of damping is the dissipation of energy over time or distance. In our previous article "Green Glue Compared", we showed how the Green stuff stacks up to other damping options available to you. Those graphs illustrated the decay of energy over time. Here we try to assess just how quickly Green Glue can destroy energy over distance.

Flanking Noise paths

The transmission of sound through structural paths rather that through the air is often called "flanking sound" - sound going to the next room through the floor or ceiling, rather than the walls. Sound going upstairs through the framework, etc. If we can reduce the amount of transmitted vibration, we can greatly mitigate the problem of structure borne noise. Related Article: Understanding Flanking Noise



This diagram illustrates some simple flanking noise paths. The red arrow is direct sound - what you would measure in a lab to arrive at an STC rating, etc. - the green and blue paths are some simple "flanking paths". Often, these paths are more important than the direct, yellow, path at many frequencies.

Acoustical Surfaces, Inc.
We Identify and S.T.O.P. Your Noise Problems
Sound Transmission Obscuring Products
Soundproofing, Acoustics, Noise & Vibration Control Specialists ™

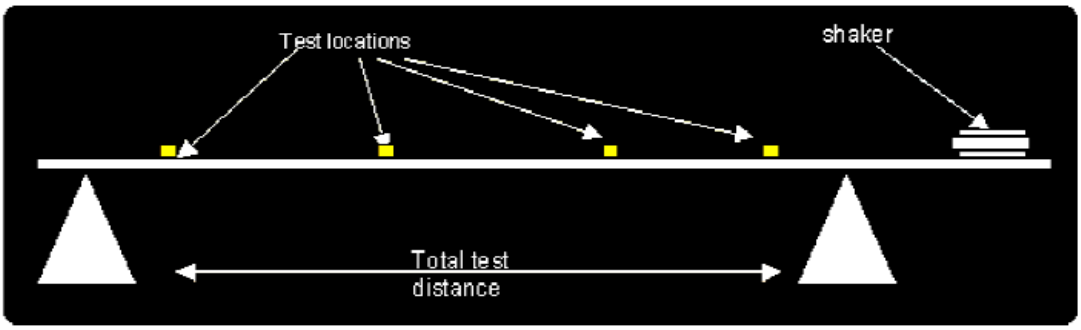
Acoustical Surfaces, Inc.

SOUNDPROOFING, ACOUSTICS, NOISE & VIBRATION CONTROL SPECIALISTS
123 Columbia Court North • Suite 201 • Chaska, MN 55318
(952) 448-5300 • Fax (952) 448-2613 • (800) 448-0121
Email: sales@acousticalsurfaces.com
Visit our Website: www.acousticalsurfaces.com

We Identify and S.T.O.P. Your Noise Problem

So just how much decay over distance can I accept Green Glue to supply?

Testing decay over distance results: Testing the decay of vibration over distance in a mechanical structure is very challenging. All test structures have to be finite, and sound reflecting from the ends causes interference, modal activity, etc. and confuses the readings a bit. Since lab test samples essentially always have to be smaller than real world constructions, this will lead to conservative estimates of decay over distance in the smaller structures (as some of the vibration at any point is reflected).



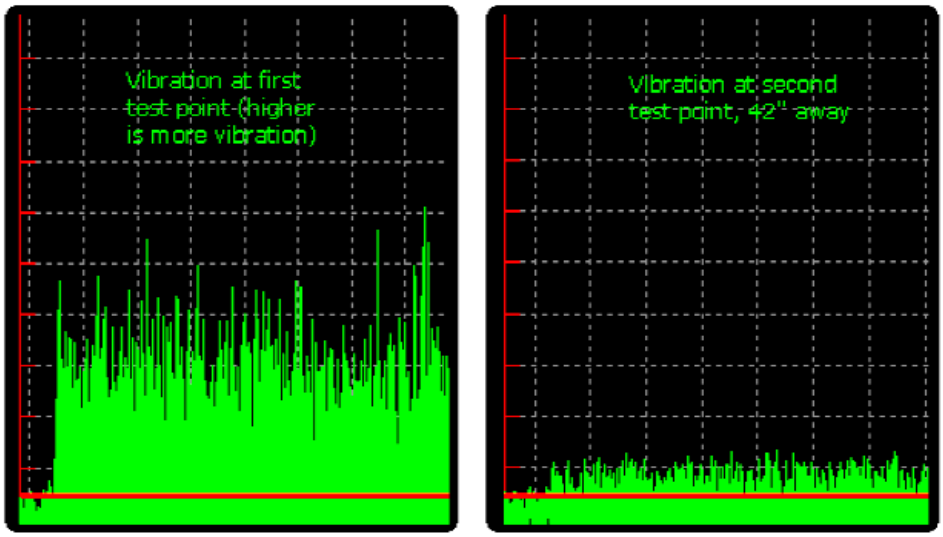
Nonetheless, this simple test illustrates, conservatively, the performance of the Green Glue in this regard. This diagram illustrates the basic test set-up.

Data Sheets: It can be helpful to view the simple vibration levels at all frequencies, to gain an idea of whether or not energy is decaying across the test distance at all.

Green Glue Test Results

The test specimen was 2 layers of 5/8" drywall damped with Green Glue.

These plots reflect acceleration levels with 20-20k Hz stimulation at the first test point (just across the support) and another point 42" away. In just 42", the vibration has decayed nearly to the noise floor, which is reflected by the horizontal red line. This reflects roughly 12dB of decay (we'll take a more detailed look in a moment)



This audio file demonstrates the dramatic noise decay over 8 feet in a Green Glue damped 5/8" drywall panel. The majority of noise in the second segment is simple background noise.

Acoustical Surfaces, Inc.

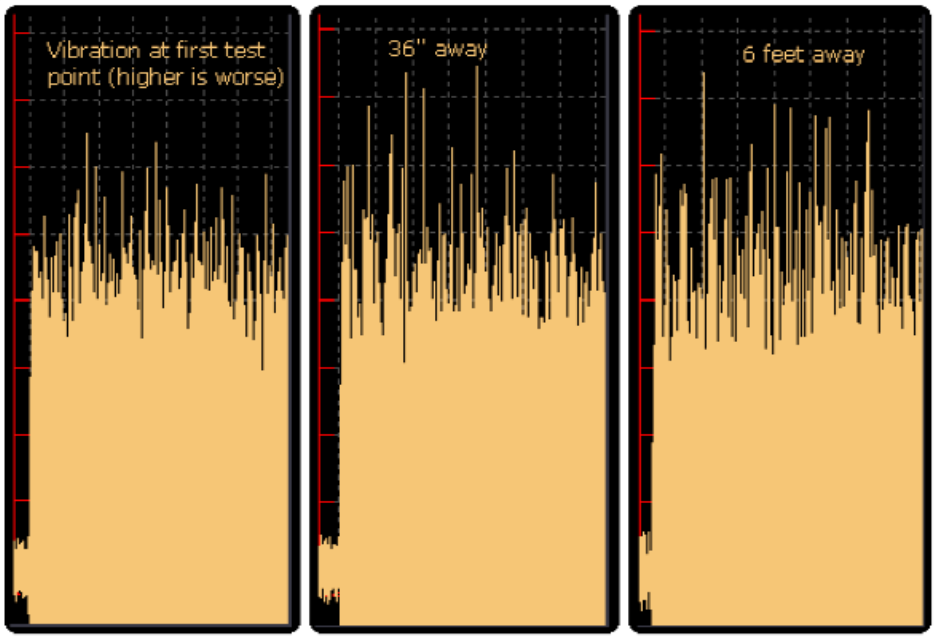
SOUNDPROOFING, ACOUSTICS, NOISE & VIBRATION CONTROL SPECIALISTS

123 Columbia Court North • Suite 201 • Chaska, MN 55318
(952) 448-5300 • Fax (952) 448-2613 • (800) 448-0121
Email: sales@acousticalsurfaces.com
Visit our Website: www.acousticalsurfaces.com

We Identify and S.T.O.P. Your Noise Problem

Raw Drywall Testing

Raw drywall doesn't fare nearly so well. These are the acceleration levels 12" across the first support, 36" farther away, and 72" farther away. It may appear that the vibration level actually rises, but this is simply an illusion caused by modal response in the drywall. The rate of decay is so low that sound reflected off the end of the test specimen can create peaks and nulls at various locations, giving the appearance of negative decay. This test is meant to measure decay, so the absolute values aren't what's important, the change from position to position is.



This audio file illustrates the inability of conventional building materials (drywall) to dissipate energy. You hear the decay (lack thereof) over 8 feet in undamped drywall. The level hardly changes, the spectrum merely shifts.

By far the most effective form of decoupling is the "room within a room", where double rows of studs are utilized in combination with separate ceiling joists to create a situation where almost no mechanical connection exists between the room and the rest of the structure.

Structure-borne noise is reduced, as there is no mechanical path from noise to the main structure of the construction.

The graph (right) gives data for decay over a 6 foot section in the center of a 16 foot specimen, again the material is 5/8" drywall damped with Green Glue.