I used 3M 950 adhesive "tape" to secure the accelerometer for comparison to the Dual Lock; it's really strong and in this version only 5 mil thick. It's really just adhesive tape without the tape. We use it to temporarily attach accelerometers to specimens in drop tests where we have to record the shock pulse the product sees when its package is dropped 4 feet. It comes off with some rubbing, doesn't leave a residue on the parts.

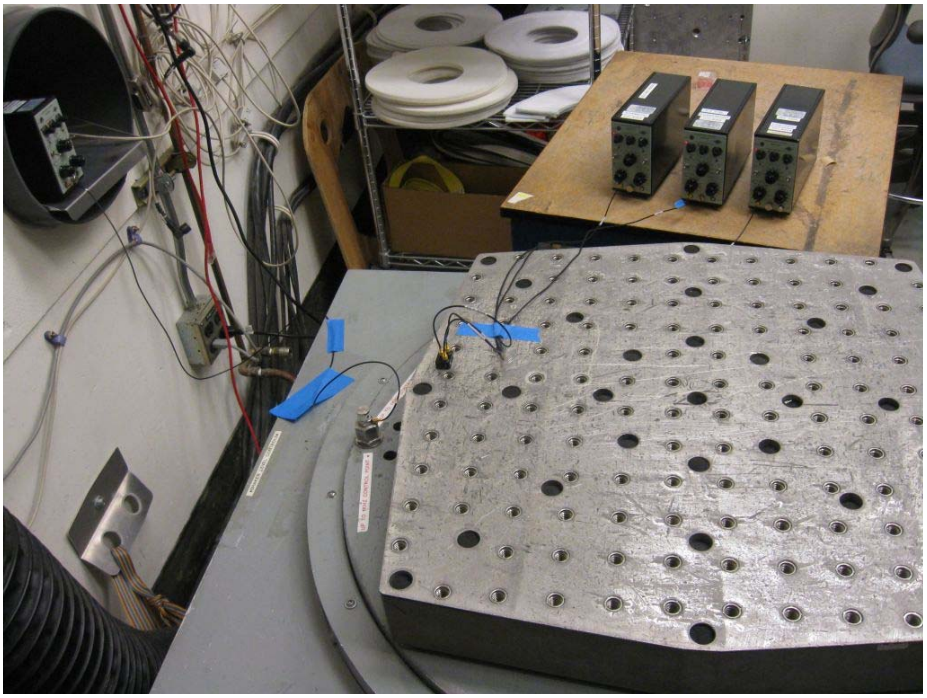
The accelerometer is a B&K 4326A triaxial sensor, three individual accelerometers in an aluminum block. Since it was about 13 g on its own I figured that would roughly represent your part. The stimulus was a random vibration from 5 to 2000 Hz, 0.5 g RMS, with the acceleration (PSD, in this case) flat across the frequency range. The output from each channel of the triaxial accelerometer is divided by the table control accelerometer output, giving a unitless gain graph of the frequency response at the test accel. If everything was perfect and had no gain or attenuation, the plot of the channel that is in the direction of vibration would be 1.0 all the way across the frequency range, and if there is no cross-coupling the other two sensors would theoretically be zero across the range. As it turns out, our shaker table has an internal resonance around 1300-1500 Hz (most of our tests only run to 500 Hz) and that shows up in some of the responses, so I don't trust it to be a nice linear comparison in that area as I didn't take the time to do any of the tricks to minimize that effect.

The first graph is of the test accel mounted with the Z axis (green) in the direction of vibration. You can see it's 1:1 until it gets up to that shaker resonance range, and the other two channels are pretty much zero.

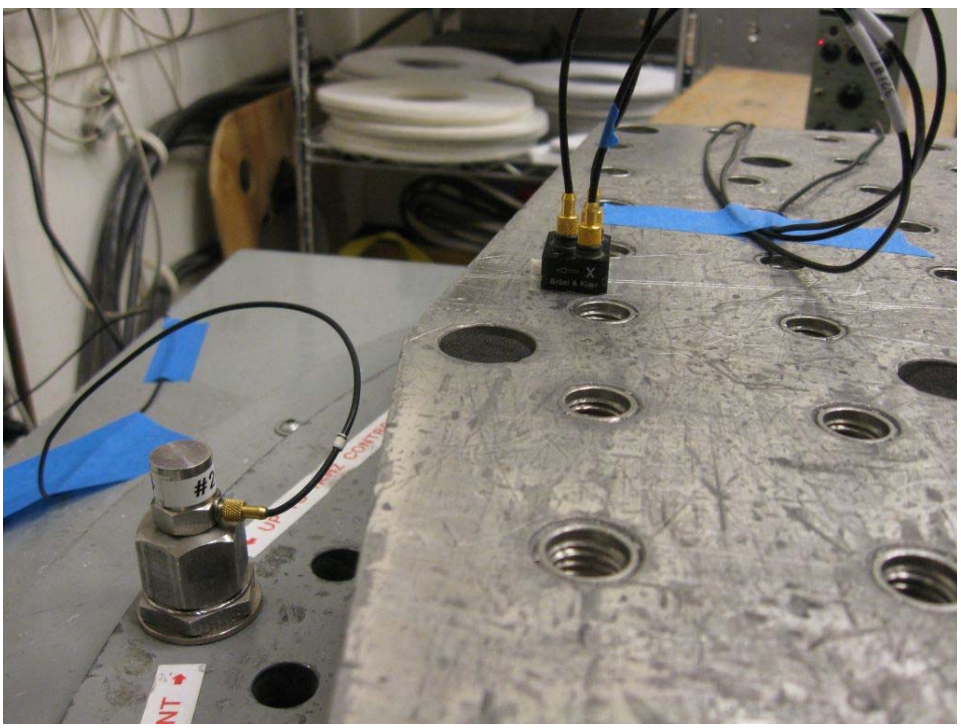
The second graph is of the same orientation but with the Dual Lock as the attachment. Starting around 200 Hz the response starts to get amplified and it increases until it's about double the input by 1400 Hz, and the output of the other two channels starts to get busier, too.

The third graph is of the response with Dual Lock but with the X (blue) axis in the direction of the vibration to show the sideways response of the Dual Lock. The accelerometer so mounted appears to have a resonant frequency around 400 Hz, with a peak gain of about 2 before falling off and sharply attenuating the actual level in that direction. The cross-coupling is greater, too, as the Z axis response gets pretty happy, no real surprise because of the flexibility of the Dual Lock stack and how it cantilevers the accelerometer away from the mount surface.

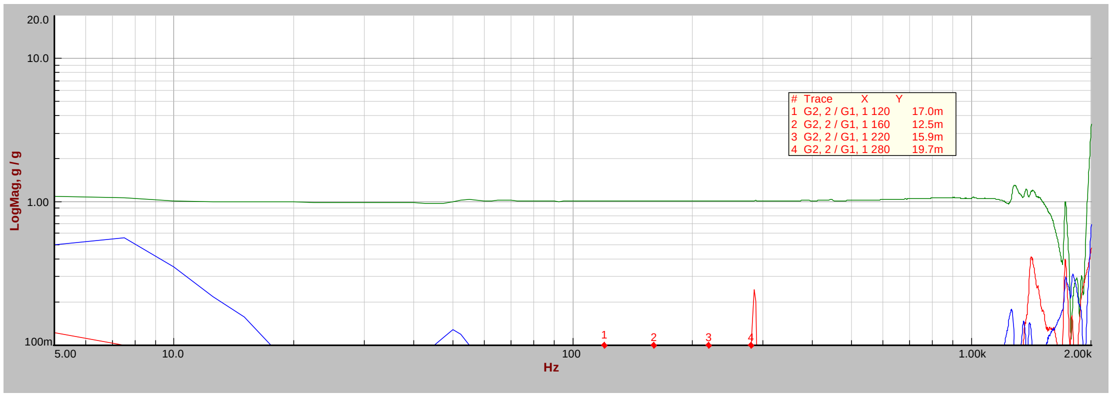
Given all that, it's probably not ridiculous to use the Dual Lock if you're looking at frequencies below 100 Hz. Above that and you're going to get some inconsistencies.



Overall test setup

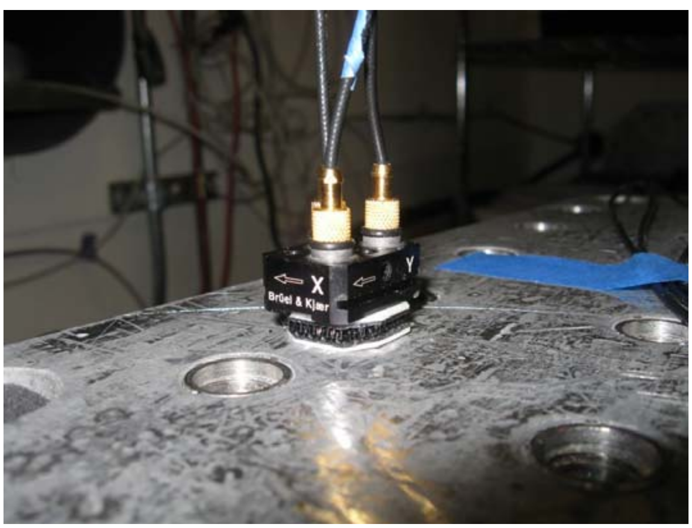


Triaxial test accelerometer (black, mass =13 g) mounted with 3M 950 adhesive (5 mil thick)
Table control accelerometer is at left

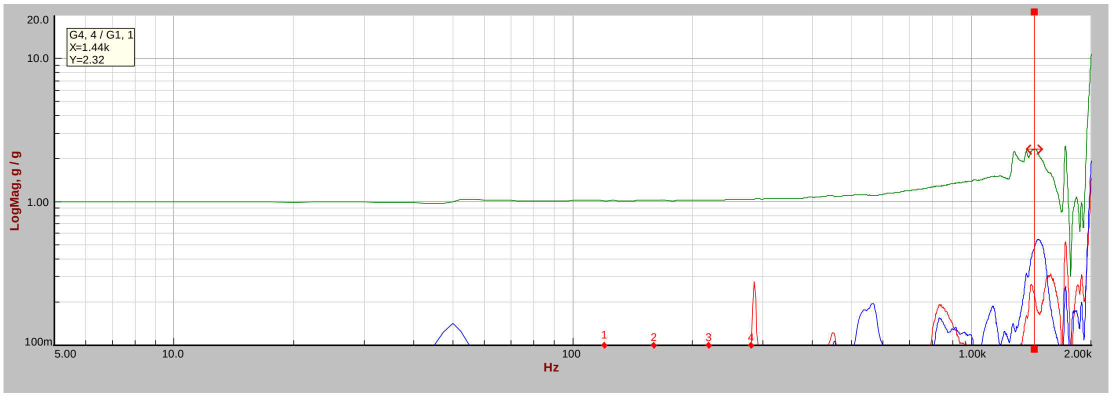


Triaxial test accelerometer output divided by table control accelerometer (unitless)
Test accel mounted with 3M 950 adhesive tape, Z (green) in axis of vibration, blue is X, red is Y

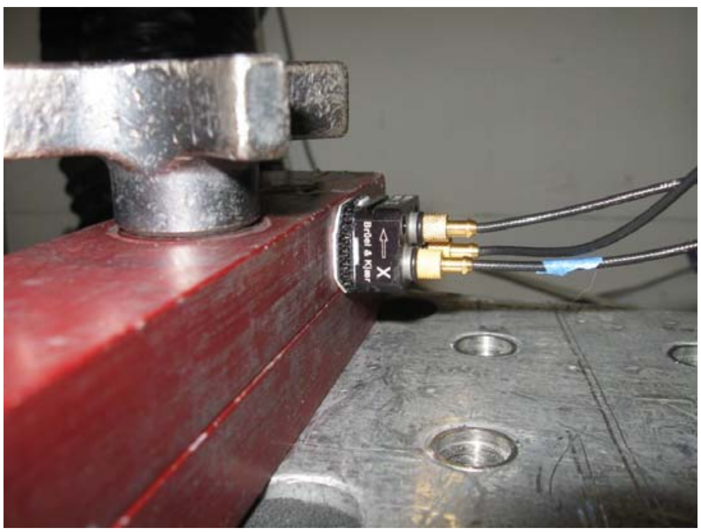
Test accelerometer and ¾” diameter 3M Dual Lock patch before mount

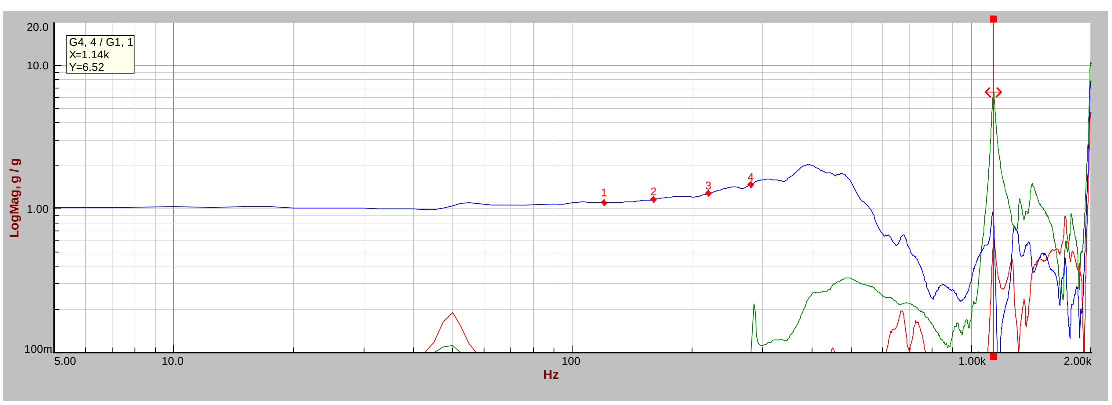


Test accelerometer mounted with 3M Dual Lock, Z in axis of vibration



Triaxial test accelerometer output divided by table control accelerometer (unitless)
Test accel mounted with 3M Dual Lock, Z (green) in axis of vibration, blue is X, red is Y





Triaxial test accelerometer output divided by table control accelerometer (unitless)
Test accel mounted with 3M 950 adhesive tape, X (blue) in axis of vibration, red is Y, green is Z