

Accelerometer Testing

Panel Test Setup



Test panels were clamped to the front of an 18" driver.

A sine wave was swept from 50Hz to 1500 Hz at 94 dB for all panels .

The Z axis accelerometer spectrum was recorded (perpendicular to the panel)

Accelerometer

A MEMS accelerometer was mounted to a PCB, with analog filters limiting the bandwidth to 50Hz – 1500Hz.

MEMS Accel: ADXL335
3 Axis, +/- 3g, 300 mV/g
10% accuracy, analog outputs,
1.6KHz bandwidth,

The PCB was attached with Hard Epoxy to a lightweight steel base to be used as the attachment point.

Attachment of the base to the panels under test was made with dental glue, which is traditionally used for this application.



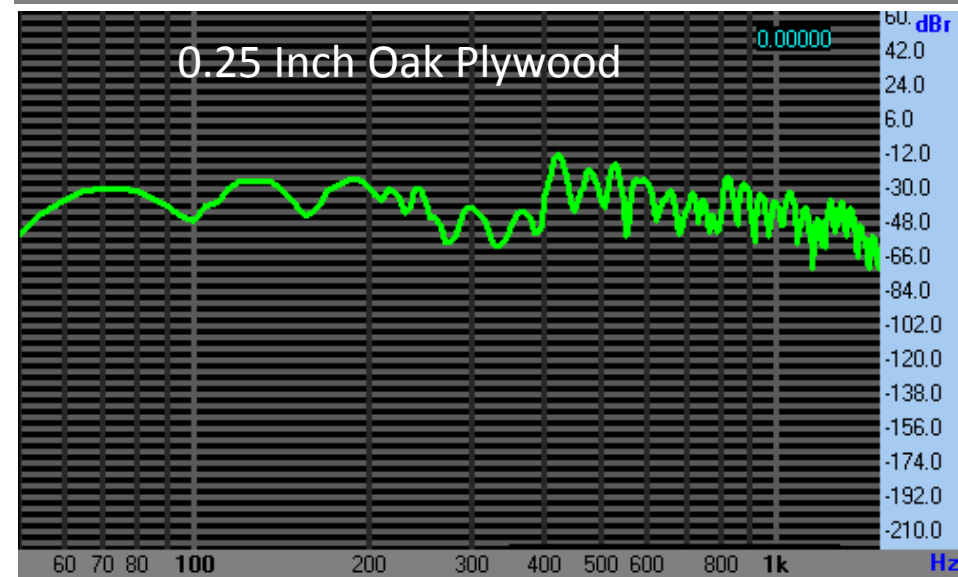
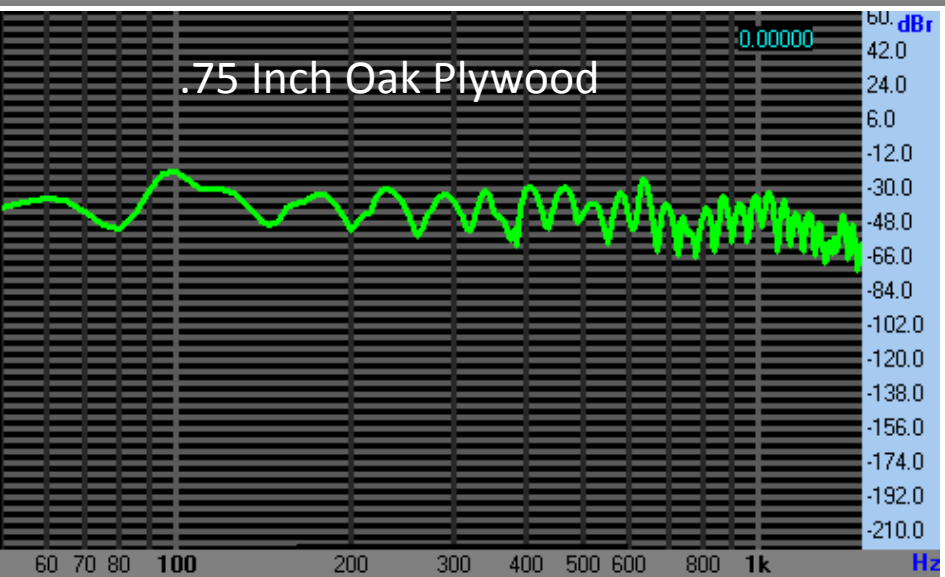
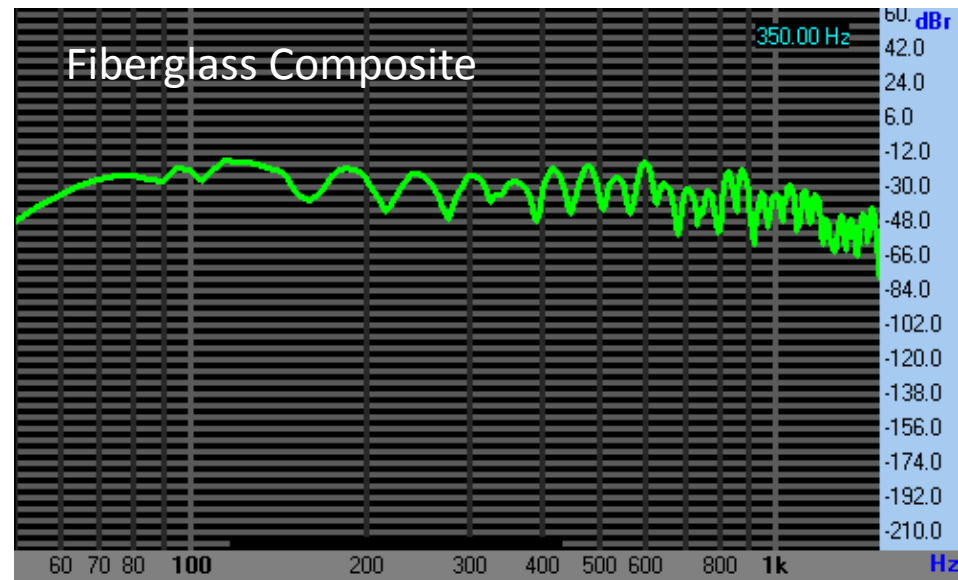
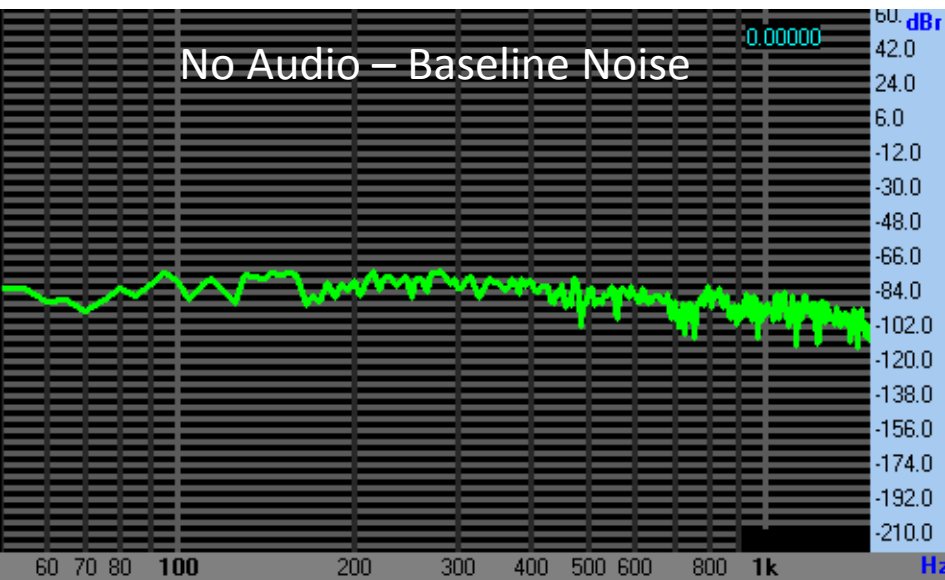
Test Panels Setup



6 different panel types were tested.

The most interesting were the $\frac{3}{4}$ " Oak Plywood and the Sandwich Composite made from Fiberglass and Extruded Foam.

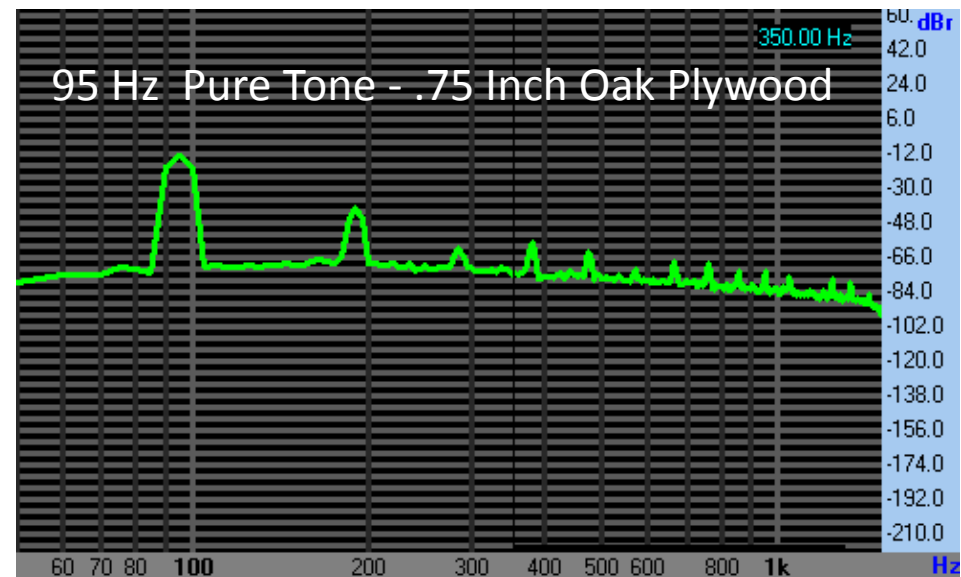
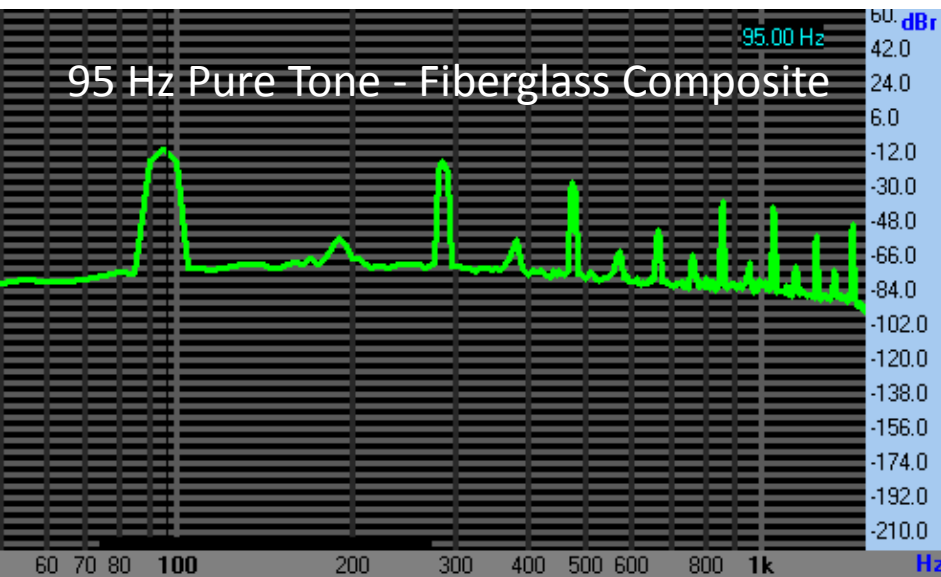
Accel Spectrum



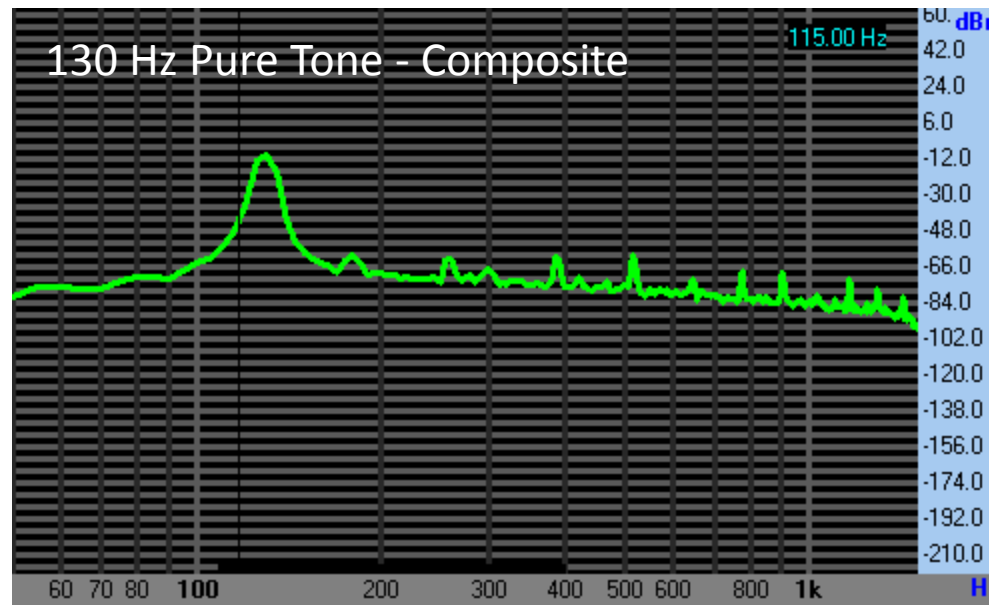
Interesting that both resonate at 95 Hz

The Plywood favors Even Harmonics and dampens out quickly

The Composite Favors Odd Harmonics and stays stronger



At 130 Hz, where there was no real resonance in the Sweep, as expected, we don't see any harmonics in the composite. Just checking the setup.



Accel Observations

It's clear the $\frac{3}{4}$ " plywood is stiffer than the .25" plywood – the accel spectrum shows many more modes in the .25"

The Plywood has more lower modes than the Composite. This makes sense due to the stiffness of the composite.

The harmonics are dampened out more quickly in the plywood than the composite. This makes sense due to the higher stiffness of the composite.

The Plywood has even harmonics, the composite has odd harmonics. Don't know what this means or why it is like that.

Overall, I don't know what all of this means. I do know that I can't wait to listen to it...

Bottom Line: I have no doubt that the fiberglass / extruded foam sandwich construction will outperform conventional plywood.