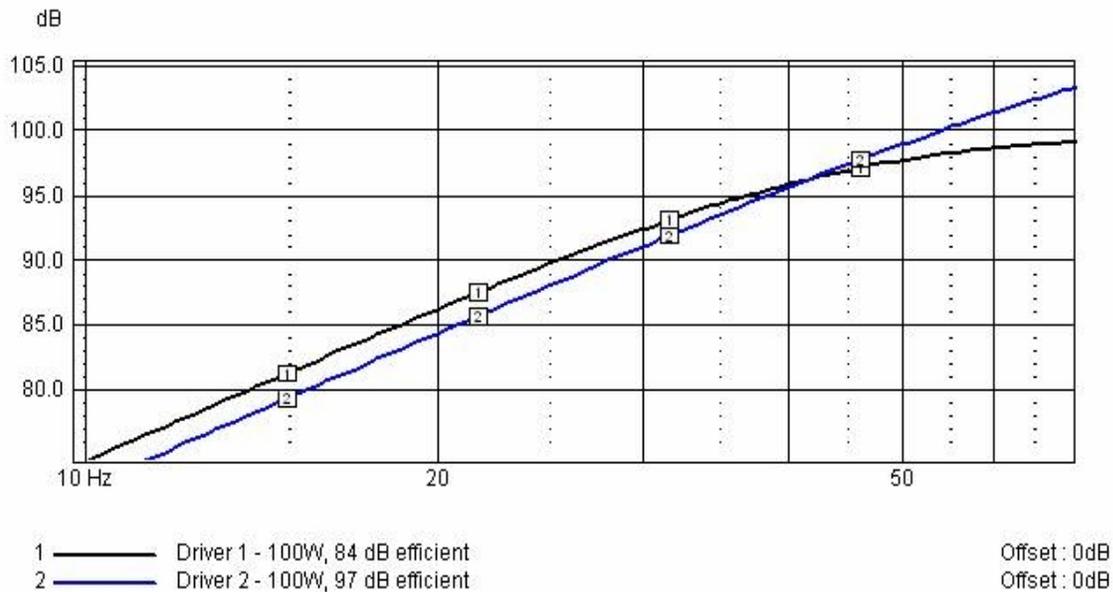


Subwoofer "efficiency" vs. subwoofer output

In this paper we are going to take a look at subwoofer efficiency vs. subwoofer output. It is a common mis-conception that subwoofers need to be "efficient" in order to gain a lot of output. For refrigerator-sized enclosures that can be true, but for car audio sized enclosures the **opposite** is true. For small sealed or small ported enclosures, less efficient subwoofers will produce more output. Let us show you how.

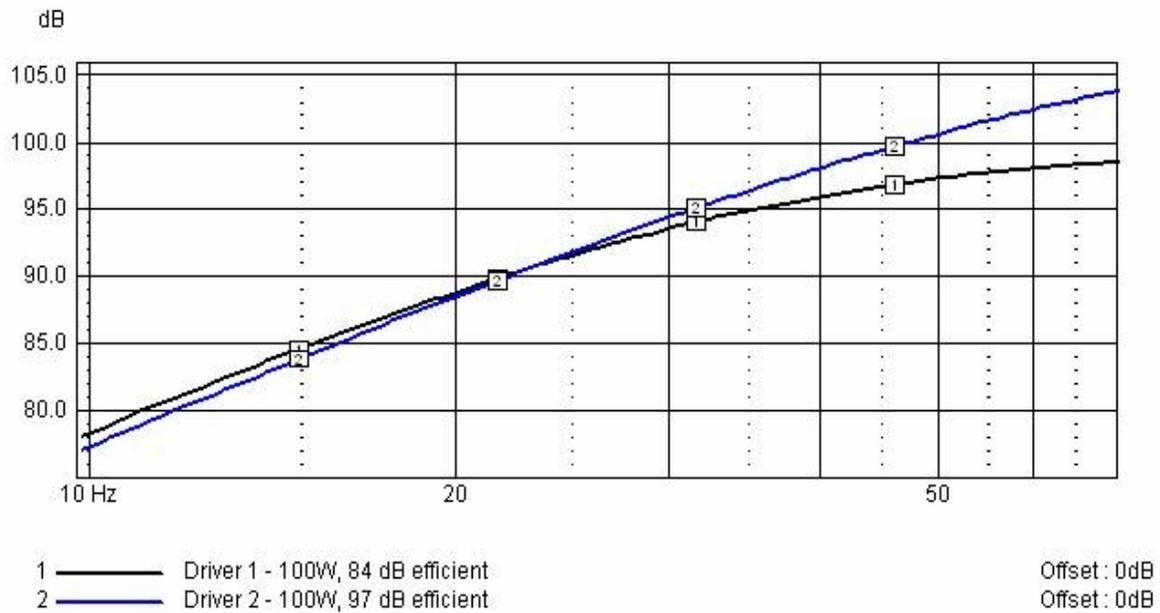
This is a graph showing the output of two different drivers in a sealed, 1 cubic foot enclosure.. Both drivers get 100W of power. Both drivers are 12" units. Note the 13 dB difference in efficiency of the two drivers! But, below 40 Hz, the 84 dB efficient driver has MORE output. With a 70 Hz low pass crossover, you would tend to have more output overall with the lower efficiency driver.



The reason is that the **box** dominates the real low-end efficiency of the system, **not** the driver! In this case, the driver optimized to work in a small box and play low HAS to be inefficient (84 dB so). The driver that seeks to be efficient loses in terms of low frequency output.

Bottom line: for a car audio subwoofer, you really do **not** want an efficiency of more than 84-86 dB, especially if you are going to use a small sealed box. If you want more output, you don't need a different woofer - you need a different box! Lets take a look and see what happens if we bump up to a 3 cubic foot sealed box with the same drivers and same power:

Stereo Integrity subwoofer "efficiency" paper



OK, now we see things start to change. The more efficient driver now has more output from ~22 Hz and up. So if you want to use that extra efficiency of the driver, you need to give the driver a bigger box...a **much** bigger box! A small box basically negates the benefits of the higher efficiency driver.