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Subject: Cone Stiffness!

Posted by [Jerry](#) on Tue, 11 Jun 2002 22:28:35 GMT

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Hey Wayne, yet another question! Hehehe, Im gonna drive you insane one of these days. Anyways, my question is, for subwoofer duties with frequencies less than 100hz, does a VERY VERY stiff cone ALWAYS have an advantage over a less stiff one? Also, what about cone weight? Will a lighter cone always sound "more accurate" than a heavier one? And, if you increase cone weight, you decrease SPL, decrease the FS, increase the VAS, and Increase the QMS right? Thanks!

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Subject: Re: Cone Stiffness!

Posted by [Adam](#) on Tue, 11 Jun 2002 23:02:12 GMT

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Stiffer cones are generally better... You really want to keep a linear, stiff piston as much as you can. Stiff cones will have bad breakup modes as opposed to less stiff materials. So it is conceivable that softer materials are better for tweeter units, whilst hard materials are best for sub duty. This is just a very broad generalisation. As far as cone weight goes, it is extremely relative to motor strength. Increasing moving mass will decrease fs, raise Qes (not qms I don't think) and lower sensitivity. As far as accuracy... The answer is also no. It plays a part, but there is no direct correlation. It all depends on how the motor handles the moving mass. The Ground Zero plutonium has just under 300 grams of moving mass (a lot), but the 1,200 ounce magnet and high power motor still allow the sub to maintain a qes of .157, which is very impressive. Likewise, you could have a sub with like 50 grams of moving mass, but if it has a very weak motor, it will sound sloppy. So you have to consider the driver as a whole; moving mass alone is virtually irrelevant. Having said that, I am also not implying that Qes has anything to do with determining the sound quality of the sub, because it really has very little to do with it, unless it is excessively high, like 1.2 or something. There are great sounding woofers with a Q of .2 and great sounding woofers with a Q of .6 .Adam

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Subject: Re: Cone Stiffness!

Posted by [Wayne Parham](#) on Wed, 12 Jun 2002 04:19:23 GMT

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Regarding mass, the motor and diaphragm are a system that can be expressed in a power to weight ratio, just like any other accelerating system. So if the diaphragm is heavy but the motor is strong, it will act similarly to another motor having a lighter diaphragm but correspondingly less powerful motor. The difference is that the heavier diaphragm has lower resonant

frequency. Regarding stiffness, there are two separate issues. One is the suspension, and a stiff suspension raises resonance and mechanically damps the motion. This has an influence on electro-mechanical parameters. The other issue is cone stiffness. This sets cone flex behavior. A stiff cone may remain pistonic up to a higher frequency, but when it begins to flex, the ripples across its surface may be heavily resonant. This kind of breakup causes severe response anomalies. The cone can be made with material that is less stiff, but more well damped internally. This kind of cone will become non-pistonic at a lower frequency but will behave better when it does.

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