Subject: Does sensitivity MEAN coloration?
Posted by akhilesh on Tue, 13 Jan 2004 14:07:16 GMT
View Forum Message <> Reply to Message

In the Jan 2004 issue of Stereophile, John Atkinson, the editor, (in the letters section) says that higher sensitivity means more coloration....that less senssitive speakers color the sound less, nd as long as one uses a mongo powerful amp, one will hear more "neutral" sound. I do not understand why sensitivity leads to more coloration. Maybe somebody can explain? Perhaps even John Atkinson if he has discovered this forum?thanx-akhilesh

Subject: Re: Does sensitivity MEAN coloration?
Posted by hurdy_gurdyman on Tue, 13 Jan 2004 14:46:28 GMT
View Forum Message <> Reply to Message

That's not exactly what he said. He said, and I quote, "...that high-impedance, high sensitivity design design allows a speaker to be driven to high SPLs with very few watts and sound convincingly lifelike, at least with some kinds of music. The downside is that neutrality, low frequency extension, and dispersion can become compromised. By contrast, by going the low-sensitivity, low-impedance route, a speaker designer can minimize coloration and maximize bass extension for a given enclosure size. The downside is that the speaker can then make excessive demands for current from the amplifier and perhaps sound lifeless. You pays your money, you makes your choice."Notice, he said it "CAN" become colored, not that it will. With high efficiency designs, it takes extremely good design and build quality to sound neutral, much more so then low efficiency designs. This costs a lot more money. Also, to get good, full sounding bass extension requires very big, well built and well braced boxes or horns, which take up a lot of space and are also expensive. Many high sensitivity designs take shortcuts aroud these things and make less then ideal high efficiency designs to make them affordable and small enough to fit in a somewhat typical living room. These designs are, indeed, colored, although the trade-offs may well be worthwhile because of the life-like dynamics and great fine detail. Really big, expensive designs have no more coloration then most lower efficiency designs, but take up much more space and cost a lot more. Having it all has it's cost.Dave

Subject: But so what if there's colouration?
Posted by GarMan on Wed, 14 Jan 2004 14:37:40 GMT
View Forum Message <> Reply to Message

In the price range that we mere mortals are allowed to operate, you're not going to find a speaker/amp combo that'll excel at everything. Compromise is a fact of life. The real issue is, knowing what's important to you, how much of it you can get, how prominent the shortfalls are, and if you can deal with them. It's true that a lot of low and mid-priced high efficency speakers

provide high sensitivity at the expense of a neutral tone. But I would never consider colouration to automatically be a bad thing. True, accurate reproduction is an honourable pursuit, but in the end, it should all be about musical enjoyment. And let's face it, sometimes, colouration sounds good. "Classic tube" sound, anyone?The 2Pi Towers that I built this Fall are coloured. (There, I said it) But the colouration can easily be acclimatized (after a couple of songs, if you don't pay attention to it, you won't notice it) and in no way is it considered offensive. And while there's no doubt that the speakers would sound better without the colouration, they make up for this shortfall by delivering a lively, dynamic, detailed and engaging presentation with a healthy serving of good quality bass. These speakers will put a live concert in your living room. For me, having to live with the colour is a small price to pay for these other qualities.Again, it's all about what's important to you. But don't neglect the music for sound.Gar.

Subject: Re: Does sensitivity MEAN coloration?
Posted by akhilesh on Thu, 15 Jan 2004 14:35:16 GMT
View Forum Message <> Reply to Message

Thanx Dave.I guess i was just wondering if there is something intrinsic about higher sensitivity speakers that makes them more colored, or less neutral, or whatever. Sensitivity means: they produce more volume for less power. Apparently, this can only happen with lighter cones. Heavier cones apparently are more neutral (or less colored or whatever term you ant o use). I think this is because heavier cones are less prone to "breakup" at higher frequencies. This is my best understanding of WHY sensitive speakers are prone to more coloration (or less neutrality). Comments welcome!thanx-akhilesh

---

Subject: Re: Does sensitivity MEAN coloration?
Posted by Wayne Parham on Thu, 15 Jan 2004 16:17:22 GMT
View Forum Message <> Reply to Message

Hi Akhilesh!Breakup modes are caused by cone flex. When the diaphragm moves as a rigid piston, it acts pretty much like a single mass/spring system. But when the cone begins to flex like ripples on a pond, it begins to act more complicated, like several smaller masses and more rigid springs are included in the system.Really, no loudspeaker is immune, high efficiency or low. Breakup modes are due mostly to diaphragm material and construction geometry. As you can imagine, a very rigid material will shift the breakup modes higher, but then they will break away more violently, having resonances with higher amplitide or Q. Less rigid materials might breakup sooner but with more damped modes. And the geometry of the cone can be used to set its breakup characteristics too.There are those that try to limit loudspeaker operation to pistonic modes, and there is merit to that, but it is difficult and expensive. Most large-format cone drivers have their first flex below 500Hz, and even small cones usually flex by 1kHz. Dome tweeters are usually rippling in the top octave or the one below it. So avoiding breakup modes requires multi-way configurations.Some designs embrace breakup modes and build drivers that have

controlled flex behavior. The whizzer used on some drivers exploits breakup modes to extend high frequency response. Even without the use of a whizzer, controlled breakup modes are responsible for high frequency performance of many drivers, of both cone and dome shapes.It's really all about creating a convincing illusion. Certainly one wants to have a loudspeaker that makes an accurate signal reproduction, and I believe that the more accurate, the better. But perfection is a goal that probably won't be reached, and so the creation of a convincing illusion is a more realistic objective.Wayne

---

Subject: Re: Does sensitivity MEAN coloration?
Posted by akhilesh on Thu, 15 Jan 2004 18:10:12 GMT
View Forum Message <> Reply to Message

Thanx Wayne! Your explanation makes sense. So I am not really sure why Atkinson would say (and i suspect it's a widely held belief) that sensitive speakers are somehow LESS neutral (or more colored). One possibility is that he was talking about the EXECUTION of poor designs, and that it may be harder to implement a sensitive speaker design well, rather than something intrinsic in the nature of sensitive speakers. I guess the motivation for me asking this is to understand if a mongo power amp-less sensitive speaker setup is intrinsically BETTER than a sensitive speaker-2 watt SET setup. ALl the less sensitive speakers I have heard sound dead to me, but that could be because they are being driven by poor solid state amps. I am not sure. ALso, there seems to be a new rediscovery of sensitive speakers in the pages of stereophile, etc, where a 91 DB speaker is called "sensitive" nowadays, and the 2-3 db gainns over the average sensitivity (which I suppose is 88 db) are much touted. Thanx everyone for shedding more light on this.
-akhilesh

Subject: Re: Does sensitivity MEAN coloration?
Posted by Wayne Parham on Thu, 15 Jan 2004 20:04:26 GMT
View Forum Message <> Reply to Message

If you think about it, all high-efficiency cabinet designs tend towards using horns or resonators. This, in itself, is going to cause a tendency to have a peaky response curve. That's a generalization, to be sure, but it is one that isn't totally without merit.There are a couple things that I think are important to consider though.First is that all loudspeaker systems - even low efficiency ones - have resonators. The speaker motor itself is reactive, and the diaphragm and suspension form a mass/spring resonator. The crossovers are reactive. Frankly, the whole system is highly reactive, and no where near a resistive load, in any domain - electrical, mechanical or acoustic. So there isn't any getting around this, and a good design takes it into account, damping the resonances that are there in all system designs.Second is that dynamic range is difficult to achieve with an inefficient speaker. You can't hit 120dB peaks with an 85dB speaker. It would require 3000 watts, and that if the speaker didn't suffer from compression. No point in even going through the whole compression/power issue here - The point is that a low efficiency speaker

cannot reproduce sounds at even realistic levels. No way to convincingly reproduce an orchestra with one. You can make a sound of a toy orchestra, or of the sound of an orchestra very far away. But the illusion of sitting in the good seats is just not possible from the limited output of a low efficiency speaker, in my opinion.So while I think flat response is a higher priority than high efficiency, low efficiency speakers aren't acceptable to me even if perfectly flat. If the speaker can't hit 100dB at the listening position, it's just not an option for me.

Subject: Re: Does sensitivity MEAN coloration?
Posted by Mike.e on Fri, 16 Jan 2004 01:21:41 GMT
View Forum Message <> Reply to Message

If the speaker can't hit 100dB at the listening position, it's just not an option for me.my 40hz horn gets 115db at listening position with 20watts(measured as 12v into 8ohm if i remember correctly,,V^2/R...:-)Im making up the plans for my mate,hes buying the other 8" off me, and building horn.Cheers

---

Subject: Re: Does sensitivity MEAN coloration?
Posted by Wayne Parham on Fri, 16 Jan 2004 04:01:01 GMT
View Forum Message <> Reply to Message

"my 40hz horn gets 115db at listening position with 20watts"That's more like it!

Subject: Low efficiency speakers are colored too!
Posted by AstroSonic on Fri, 23 Jan 2004 15:55:28 GMT
View Forum Message <> Reply to Message

There are many types of coloration. The subject of the initial post considers only tonal (frequency response) variations to be coloration, and that tonal coloration is THE most important aspect of a speakers performance. I consider a lack of dynamics (i.e., 'dynamic' coloration) to be important. By that measure, most low efficiency speakers are very colored! People differ in their sensitivity to errors/imperfections in reproduced sound. We are all free to buy/build what we enjoy. The actual Stereophile statements were less dogmatic and biased than portrayed in the initial post. Nonetheless, (tonal) coloration is widely assumed to be the first and most important measure of a speakers worth.Bob

---