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Subject: same speakers

Posted by [canjie](#) on Mon, 08 Dec 2003 16:29:31 GMT

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Hello PeopleMaybe this question sound's stupid too you but I really want to know an answer.Let's say that we are comparing two speakers with the "same" T/S parameters:One has for example this parameters: SPL = 100 dB and Power = 600 W , 15" diameter, etc... sameSecond one: SPL 100 dB and Power = 200 W , 15" diameter, etc...sameSo, the only thing different is the Power of the speaker, which is different.What is different between these two speakers besides that first one can handle more power?

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Subject: Power handling and compression

Posted by [Wayne Parham](#) on Mon, 08 Dec 2003 18:58:09 GMT

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The speaker with greater power handling capacity is better able to dissipate power in the voice coil conductor, either because of improved materials or more likely because of better cooling ability. Improved cooling ability is usually the result of venting or other similar heat transfer mechanism. A speaker with improved power handling will also suffer less compression than a comparable speaker with a lower thermal limit. For example, at 100 watts, the speaker with higher capacity may only have 0.5dB compression while the speaker with lower limits may already be at 3dB compression or more.

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Subject: Re: Power handling and compression

Posted by [canjie](#) on Tue, 09 Dec 2003 07:35:05 GMT

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about what compression we are talking about?

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Subject: Re: Power handling and compression

Posted by [Wayne Parham](#) on Tue, 09 Dec 2003 09:16:44 GMT

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Here's a good brief explanation:JBL FAQ - What is "power compression"?

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Subject: Re: Power handling and compression  
Posted by [GarMan](#) on Tue, 09 Dec 2003 11:30:04 GMT

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Wayne, A couple of questions about power handling: In terms of compression, is the result simply a reduction of volume, or a reduction of dynamic range? For example, is the signal compressed across the entire spectrum of wattage, or does it leave the lower signal alone, but compress the higher (louder) signal? If it's the first, I can probably live with it as it does not "change" the sound, but just a reduction in a linear fashion. However, a reduction of dynamic range will change the way the recording was meant to be heard. Second question: At low volumes, do drivers with higher power handling sound different than those with lower power ratings. For example, if played at a mid volume, how does an Eminence Delta sound compared to an Alpha in terms of tonal characteristics? thanks, gar.

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Subject: Re: Power handling and compression  
Posted by [Wayne Parham](#) on Tue, 09 Dec 2003 12:26:40 GMT

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Compression is greater as power is raised. At very low power levels, compression is zero and it rises to maximum at full output. Some of the better drivers only have 3dB or so compression at full power levels of several hundred watts. This is pretty impressive. But you'll also find drivers that have twice as much compression as this at full output. As for the "sound" of different drivers, my take is that they are a simple enough system that you can understand them reductionistically. System behaviour is the sum of its parts, and while some systemic behaviour arises, the system is simple enough that it is easily described and easily predictable. So when you take the electro-mechanico-acoustic properties and examine them, you can describe the speaker with a fair degree of accuracy. The most difficult part to examine reductionistically is cone flex, and even this can be found deterministically with some amount of success. This is relatively chaotic motion though, and so description of a system in chaotic behavior is best seen as averaged because it jumps around a bit. Anyway, the point of all that is that drivers sound different when their properties are different. The system acts as a set of filters, each having frequencies of interest and bandwidth or Q. So a large part of the speaker's character is determined by these filter properties. This is a big reason why two speakers can sound different when they have different specifications but similar quality of build construction. Another set of properties that are very important are motor-related and determine what kinds of distortion and amounts will be present. When you have two drivers that are tuned similarly, but one is of better build quality, this is where you'll usually notice this. A great example is in prosound woofers - many have similar specs but the \$500 woofer probably has a more linear magnetic structure than the \$150 woofer, and so 2nd and 3rd order harmonics are greatly reduced. And the third set of properties are in cone construction,

which determines how and when the cone will flex. Some are designed to extend upper frequency performance, and this is usually done with controlled resonances in cone flex - Controlled breakup modes. These provide extended smooth response up high, but the response in this mode is not as smooth as it is down low. Other devices are built to reduce cone flex as much as possible, but when the cone "breaks away" and begins to flex, it does so rapidly and violently, so they should not be used in this region at all, and must necessarily be used over a fairly narrow bandwidth. These are pretty simple systems, and so tuning of each property is pretty straightforward. I think that's why it is such a popular field for do-it-yourself builders. Lots of fun, eh?

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Subject: Re: Power handling and compression  
Posted by [canjie](#) on Tue, 09 Dec 2003 13:45:33 GMT  
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comparing two speakers with the same parameters except the power handling. Why I need too by a speaker with more power and pay it more, when I can by the same speaker with less power handling capability, which means less money spend for the amplifier. (Ok, the answer is probably:

question: Why people give money for some speaker that has power of 1000 W and SPL = 100

the compression, but for the speaker of 1000 W I will probably use amplifier which gives 1000 W

of 200 W. (I can but efficiency is greatly reduced). I want too tell that the speaker will go into compression when it is driven in full power and it is not a meter of power handling. So what is the difference?

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Subject: Re: Power handling and compression  
Posted by [Wayne Parham](#) on Tue, 09 Dec 2003 14:25:53 GMT  
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If you have two speakers with similar T/S specs, similar magnetic structures and distortion specs and similar cone structures and HF performance - If the only difference truly is power handling - then you have little reason to buy a speaker that handles 1000 watts if you'll be driving it with only 100 watts. But the truth is that a 1000 watt speaker is probably going to be superior in more ways than just power handling; The price commands superior performance. If one were comparing two speakers that were the same in all other respects, one would gain very little using one designed to handle significantly more power than is needed. But most of the time, expensive drivers from good manufacturers deliver more than just improved power handling. Compression specifications

are sometimes provided by manufacturers. Typically, compression specs are in the form of derated output in dB at certain power points, often 1/10th power, 1/2 power and full power. Compression and thermal and mechanical limits are the penalties of overpowering a driver. What you'll see is that compression is usually less than 1dB at 1/10th power, and has risen to 2-4dB at 1/2 power. By full power, the best speakers suffer more than 3dB loss due to thermal compression, and most compress more than that, often 4-6dB or more. T/S specs are also affected as the driver enters compression, so its filter characteristics change as a result. This is a valid reason for operating a speaker below 1/4 to 1/2 of its rated power limits - To improve performance by keeping its parameters consistent. But I probably wouldn't suggest that operation below 1/4 power should be imposed, even for the most quality conscious.

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Subject: Re: Power handling and compression - Reprise  
Posted by [Dean Kukral](#) on Mon, 26 Jan 2004 14:19:10 GMT  
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Is the first paragraph of this post correct???? Should it not say "Compression is greater as average power is increased?" The same pro system in a home theater is not likely to experience compression, even with very high power levels occurring from time to time, but in a rock concert it may well see compression. Either garman or I am confused about the results. If the voice coil heats up and compression comes into play, then both volume (maximum) and dynamic range are affected. Whether or not the effect on dynamic range is linear, I don't know. If maximum spl is reduced by 3dB, then spl should be reduced at every non-zero power level input by some value less than 3dB but greater than zero. This is what is meant by "dynamic range," isn't it? If the effect turns out to be linear, then there is no real effect on the music, except that it is not as loud.

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Subject: Re: Power handling and compression - Reprise  
Posted by [Wayne Parham](#) on Mon, 26 Jan 2004 14:51:20 GMT  
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Both sets of statements are true. I think yours is a great way to say it - "Compression is greater as average power is increased." But the point is that compression rises as power goes up. Compression doesn't rob all increases, but it does prevent the system from being perfectly linear, and this effect is most pronounced at high output.

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