Subject: voice coil heat dissipation device
Posted by nicolas on Sun, 11 Mar 2007 19:22:46 GMT
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Wayne:Seen your device and was wondering if a similar type device could be used with a heat dissipator coming forward thru the dust cover instead of out the back. How much heat accumulates in the rear space with the vents inside the rear space instead of going out? Have very little rear space room in present design. How about a similar design as yours with a heat dissipating plate attached to the rear wall but instead of venting into the rear space going outward past the dissipating rear plate...looks do able. Presuming the distance between speaker and rear space wall is little 1-2 inches do you think it is worth it to keep rear space as cool as possible. These will be professional use flown speakers.

Subject: Re: voice coil heat dissipation device
Posted by Wayne Parham on Sun, 11 Mar 2007 19:56:49 GMT
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You can certainly mount the cooling plug in such a way as to protrude out the front of the cone and mount a radiator/heatsink there. The thing is, that will change the characteristics of the speaker somewhat because the voice coil cap won't be there. In a typical wide-range speaker, that will change the sound at higher frequencies, since the cap is the center of the radiator, a place where path length differences won't cause cancellation at high frequencies. In a subwoofer, the cap is sometimes made very rigid to make it stronger and possibly to add mass. So those are things that will change if you run the cooling plug out through the front of the speaker.When I designed the cooling plug, my first instinct was to duct heat out of the cooling vents, rather than allowing heat to build up in the rear chamber. I expected air temperature would normally rise in a speaker with a small rear chamber used at high power levels, which would make the cooling vents less effective. My plan was to use a heat exchanger to cool the air ducted into the vents. What I found was that air temperature wasn't a big problem. The biggest problem is the heat that is retained in the magnet structure. It's like a thermos bottle, a large chunk of steel surrounded by ceramic. That's where the heat buildup is.Loudspeaker motor cooling methods

Subject: Re: voice coil heat dissipation device
Posted by nicolas on Tue, 13 Mar 2007 17:07:33 GMT
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Thanks Wayne:We miss you at audio asylum!! Too bad for the cat and mouse games played over there at times. Remarkable results with these VC heat dissipating plates. Looks like I will not have another pro use (or even home) speaker without them. Apparently not worth having vents going outside of rear space (with the possible driver parameter changes) since most VC damage is a local heat phenomenom. Large Aluminum plate will also help dissipate rear space heat

anyway.From my days as DIY plummer I remember not to contact Cupper tubing with other metals since it leads to a chemical reaction. Therefore the use of cupper clamps to hold cupper tubing in place. Will look into this further to be sure since seems cupper tubing is ideal for wicking away VC heat out to a lightweight aluminum plate for dissipation. But likely the cupper would chemically react with the iron in the pole piece even with thermal paste in between.Can see a big advantage in using these heat dissipating techniques not only on pro use speakers but also in high resolution dynamic low power drivers with edgewound aluminum cupper clad VC wound on cardboard etc formers. Like old Altec and JBLs.Anyway thanks Wayne for all the free education and info and congrats on your fine speakers.Nicolas

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Subject: Re: voice coil heat dissipation device
Posted by Wayne Parham on Tue, 13 Mar 2007 19:19:07 GMT
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Subject: GALVANIC CORROSION
Posted by dB on Wed, 14 Mar 2007 11:25:15 GMT
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I was readind this post and Wayne have in fact excelent information. Congratulations, one more time.The name for this kind of corrosion is Galvanic Corrosin. Also very important is corrosion under stress. Look under "Galvanic Corrosion Tables". There are very nice ones. I had a problem with corrosion of magnesium speakers (maybe is better to get nuts and bolts of similar material or then use nylon spacers).*nice read: Fastener Design Manual - http://www.tcnj.edu/~rgraham/barrett/manual1-A.html PICTURE FROM: http://ops.dot.gov/regs/small_ng/images/chapter3_table.png
 Galvanic Corrosion [2. GALVANIC (Two metal).]

Subject: Re: voice coil heat dissipation device
Posted by WILL VISIT OFTEN nt on Thu, 15 Mar 2007 17:18:10 GMT
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NT

Subject: Re: GALVANIC CORROSION
Posted by nicolas on Sun, 18 Mar 2007 22:27:42 GMT
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Thanks dB saved me some time!! Seems that there is little chemical potential difference between pure mild steel (clean fresh)and commercial Aluminum but significant difference between Cupper and Iron. Therefore seems that as Wayne has used pure commercial Aluminum is the best all around choice.. Again Thanks.