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Subject: Woofer cooling device - Destructive test

Posted by [Wayne Parham](#) on Wed, 24 Aug 2005 21:10:58 GMT

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This afternoon, I setup to test the cooling device for an extended duration. The initial tests were all for relatively short periods, and I wanted to run the LAB12 woofers for a couple of hours to see what happened. So I setup a woofer with a cooling system and another without, both driven with a 40V, 40Hz sine wave cycled 15 seconds on, 15 seconds off. Both woofers were in ambient free air of 72° Fahrenheit. This became a destructive test for the woofer without a cooling system. The woofer with the heat exchanger worked flawlessly and stayed cool. I ran it for 2 hours and measured the outside of the magnet at 114° Fahrenheit. The inside pole piece was 138° at the front, its hottest point. The woofer was working well, without strain and sounded good. I noticed the woofer without a heat exchanger began to make buzzing sounds at an hour and a half. I was pretty certain it had probably been damaged, so I reduced power and inserted the heat exchanger, hoping for the best. But it was already gone, and I terminated the test prematurely, at 1.5 hours. The magnet had reached an external temperature of 131° Fahrenheit and the inside pole piece was a scorching 195°. Looking into the cooling vent, I could see part of the voice coil wire, unwound and hanging behind the cone. The motor still functioned, so the voice coil was not open. It simply had started to come unglued at the edge and had separated from the former. The buzzing sound was made when it vibrated against the pole piece. I conclude from this that the heat exchanger has proven to be successful at reducing heat when the speaker is used for extended periods of time, and also successful at preventing thermal failures. To tell the truth, I was somewhat surprised at just how effective it is. I knew there would be a difference when using the heat exchanger, and the temperature measurements showed it too. But more than that, from a user's perspective, this is really significant. If you're running these kinds of speakers wide open for a few hours at a time, the addition of a heat exchanger makes a huge difference.

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