

HOGTUNES

Audio Solutions For The Great American Cruiser

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Watts Up With Watts?

Unquestionably, as far as speaker ratings go, watts are the most misunderstood, over used, and lied about spec on a speaker **EVER!** (How's that for an opening line?) Over time, the marketing departments of most speaker suppliers for all kinds of audio have led people to "believe" that the higher the watt rating on a speaker is, the louder it will play, or the better it is. What this has done to the poor consumer is have him make purchasing decisions based on a rating that for the most part means almost nothing. For example, you can choose between a \$100.00 speaker rated at 200 watts, or a \$100.00 speaker rated at 75 watts. If you didn't trust your own ears on how they sound, didn't want to get laughed at by your friends, or had nothing else you understood you could go by, more often than not the 200 watt one "has to" be better right? Would you ever get caught telling your buddies that your back tire is "200 MPH" in a manner of tone that would suggest that rating makes your bike go faster because that's what its rated at?

A speaker is a passive device, meaning it cannot do anything on its own unless power comes to it from an amplifier. The exact same parallel is the back tire on your bike which only moves when a motor/trans makes it move. Inside a speaker is exactly opposite to the motor on your bike. In a bike motor, a piston moves inside a stationary cylinder. In a speaker, there is a cylinder that moves up and down around a stationary piston. The cylinder portion of the speaker is a long piece of wire which is wound around a former. Formers can be made of metals, cardboard, fiber-glass, and plastics-each one offering their own pros and cons. The long wire wrapped around the former is referred to as the voice coil. Voice coils are typically made of copper, aluminum, or copper clad aluminum (CCA). The wire can be different gauges of thickness, different shapes, and different overall lengths, and like on the formers, each one offers its own pros and cons to the performance of the speaker.

Below is a picture of a voice coil wound on its former (Fig 1). Its always glued to the underside of the speakers cone (Fig 1a), which is the part you see moving in and out as the speaker is playing. In the picture of the voice coil, the 2 wires you see are where power from the amplifier gets connected to the speaker. Sitting still, like in the picture, the voice coil is very similar to a stove element. As power is applied, all it will do is heat up, and like any metal, will expand. When the speaker is assembled, the voice coil sits in a "gap" (Fig 2) which contains a magnetic field. On a complete speaker, as power is applied, it causes the speaker to move in and out which helps naturally cool things down. As the voice coil expands, if it touches the outside of the gap, it "dead shorts" and burns the voice coil. For most people, the term "blown" is used here.



Fig 1: Voice Coil Assembly

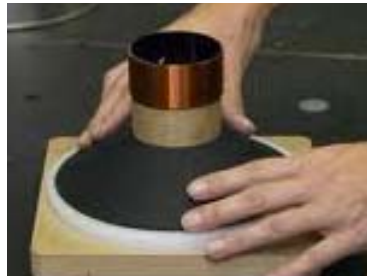


Fig 1a: Voice Coil Assembly glued to the underside of cone



Fig 2: The arrow shows the gap where the voice coil moves up and down in a magnetic field

This is where the "meat" of this article happens. The simple definition of a watt when talking speakers refers to the dissipation of "X" amount of heat over "X" amount of time. If the voice coil is too flimsy, and cannot deal with heat, it will "blow". One way to make the voice coil less flimsy is to increase the diameter size say from 3/4" to 1". With 33.33% more surface area, surely the voice coil can take more power (heat), but now you also face the fact that you have also increased the weight of the voice coil by 33.33%. Since the speaker is an electro mechanical device, you now have to apply more power to offset the extra weight, just to play as loud as it did with the smaller diameter voice coil!

A lot of companies will make crazy claims like "500 W" on a speaker that's \$49/pair. First off, they usually say "W" not watts, and they know that music has loud and soft spots so the 500 is not "constant" or "continuous". They can also argue that the speaker will take 500 watts but may just not share that the 500 watts is for a millisecond or so, but hey, they **GOT** your \$49 and you get to say your speakers are 500 "W's" :)

We cannot say for sure how all the companies come to this rating that is thrown around so much. For us, all models of fairing speakers are tested for 8 hours of constant playing at 90 watts, (using American National Standards Institute ANSI-CEA 426B "accelerated life test") but we still rate these models at 75 watts.

So what does all this mean? In our opinion, if you check the power handling rating vs. the efficiency (how loud it plays per watt) you will find that the higher the power handling the LOWER the efficiency, this "assuming" the company is giving actual data. You may also find that a higher efficiency speaker with less power will play as loud as a high power speakers with high power amp. The higher power speakers would REALLY benefit from much larger amps, but like everything in bike audio, its limited by the bikes electrical system. We believe the higher efficiency speakers with moderate power is the best approach. Your charging system and your wallet will thank-you!