



Watts AES versus RMS

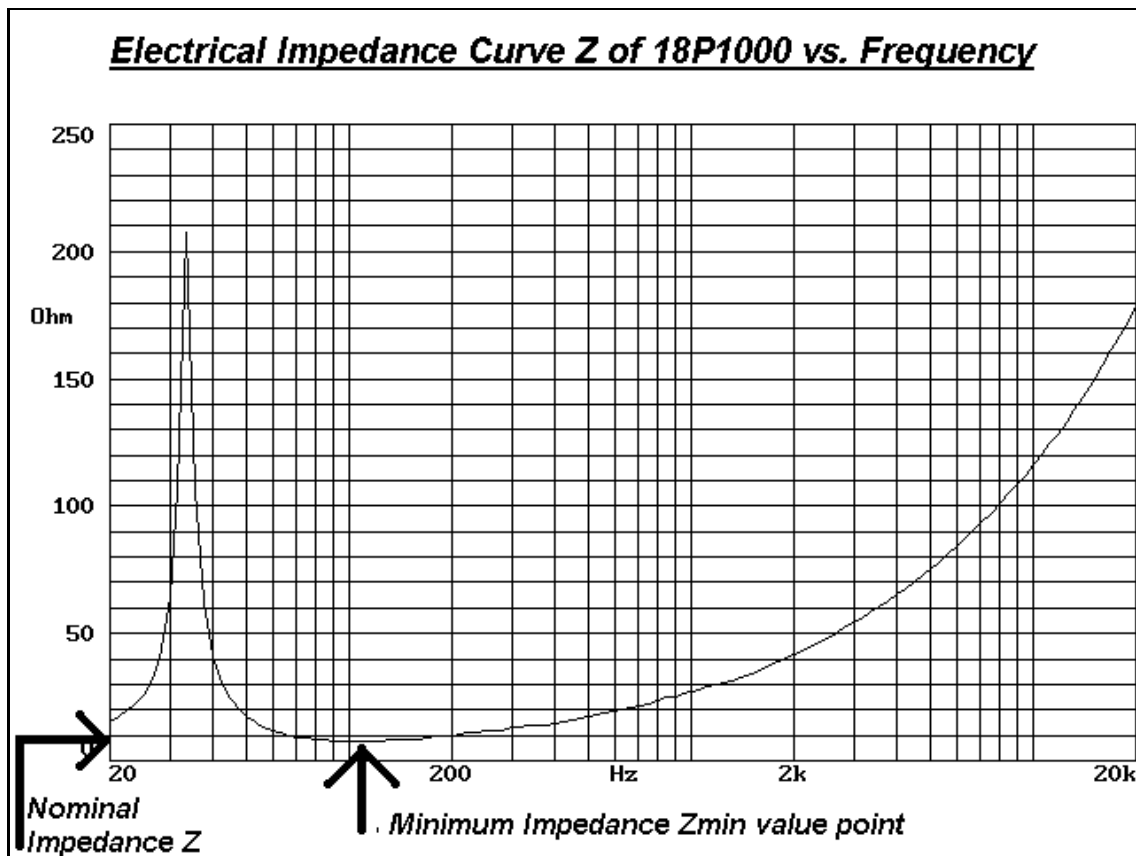
Although this is a well-known topic, we still have many consults about it, and many persons still have doubts about the difference between AES and RMS watts. That's why we have decided to comment this question, in order to clarify and dissipate any possible doubt.

Already it does something more of a year that in the engineering data sheets of the **beyma** loudspeakers the denomination of the power capacity has changed as stated by the Standard of the Audio Engineering Society of North America (AES). This association is much respected in the international scope and almost all their recommendations are fulfilled by most of the manufacturers of professional sound systems, anywhere in the world. For that reason, since a standard of engineering specifications of the components of professional sound paid attention in 1984, **beyma** has followed saying standard.

The fatigue of the loudspeakers is made with pink noise with a 6 dB crest factor, filtrated in the bandwidth of application of the loudspeaker. This is conducted in free air conditions, without neither box nor panel of no class, during two hours. The taken power as correct will be that for which the parameters of the loudspeaker have not been altered more of a 10% with respect to their nominal value.

Beyma has followed this norm in the past, with an only reservation. The power was not calculated with respect to the minimum value of impedance ($Z_{\min}$) of the model at issue, so and as it recommends the AES norm. It was adjusted with respect to the value of the nominal impedance of the unit, so and as indicated by other European norms. This was the right procedure to give the value in RMS watts.

However, it does something more of a year, became patent the necessity to change to this new denomination. Most professional component manufacturers had already changed their power capacity denomination from RMS to AES watts, and the comparison of different models from different manufacturers was getting difficult. As the power capacity of a model is one of the essential parameters to look at in the moment of the election, we decided to adopt the AES standard completely. It implies a change in the final values of power of the unit, although not in the real power capacity of the loudspeaker.



For example, the 18P1000 model, from the **beyma** P1000 series, with 8 ohms nominal impedance has a $Z_{\min}$ value of 7,4 ohms at 120 Hz. For that reason, in RMS value, a power of 1000 watts would come given by an applied tension of 89 Volts RMS. However, in AES power, this value would be of 86 Volts RMS.

This value of minimum impedance should be next to the value of the nominal impedance and, therefore, this change would not have to affect much to this number of watts.

It is very important that the manufacturer indicates this minimum value in his technical data sheets, so and as it does beyma. If this is not so, the manufacturer is hiding an important information for the user. If a driver has an excessively low $Z_{\min}$, this AES power will be very different from the theoretical RMS power value.

When using the minimum value of impedance, we are marking the maximum value of effective current that is going to demand the loudspeaker in continuous power regimen. With the RMS calculation, this fact was not taken into account. Therefore, two different drivers with the same rated RMS power capacity, would have very different current demanding from the power amplification system.

When calculating the nominal power with the AES criterion, the relation between the capacity of the power amp and the loudspeaker is optimized. This is in fact one of the main reasons for the adoption from most manufacturers of the AES standard.

In addition, many manufacturers have increased the confusion of the user by adding to their power data their own invented standard. Although probably with the best intention, to have three or four power capacity numbers only produce misunderstandings in place of clarifying doubts. For comparative purposes, the only right value is the AES standard. It is highly recommended to read carefully the small sentences in illegible font size at the bottom of the technical data sheets for proper comparison purposes.

For the interest of our users, the AES standard can be downloaded freely in English in the following Internet address:

http://www.aes.org/standards/b_pub/aes-standards-in-print.cfm under the name [Aes2-1984 \(r2003\)](#)
 "AES Recommended Practice -- Specification of to loudspeaker components used in audio professional and sound reinforcement"