SB ACOUSTICS

Technical note

Adding mass to a passive radiator

When using a passive radiator, you may find it necessary to add extra mass to its cone in order to be able to tune your speaker system just the way you like it.

When you add extra mass, some fundamental parameters of the passive radiator change.

The moving mass increases (obviously).

$$m_{ms,new} = m_{ms} + \Delta m$$

, where Δm is the total added mass and m_{ms} is the moving mass of the passive radiator before the extra mass is added.

Now we can calculate the mass factor.

$$MF = \sqrt{\frac{m_{ms,new}}{m_{ms}}}$$

Finally, we can calculate the free air resonance frequency and the mechanical Q-factor.

$$f_{s,new} = \frac{f_s}{MF}$$

$$Q_{ms,new} = Q_{ms} \cdot MF$$

, where f_s and Q_{ms} are the free air resonance frequency and the mechanical Q-factor before the extra mass is added.

All other parameters for the passive radiator remain unchanged.