

An Improved Loudspeaker Frequency Response By Using a Structure of Rigid Absorptive Panel in a Vented Cabinet

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Abstract

When placing a loudspeaker in a vented cabinet, standing waves inside the cabinet affect the frequency response with ripples. This peaks and dips due pressure cancellation inside the cabinet have an effect on the diaphragm displacement other than getting out from the vents. For those frequencies the transducer would otherwise have a smoother response if it was in a condition of total absorption of the sound waves at the back of the cabinet. The solution of placing sound absorbent material inside the cabinet to reduce the standing waves makes the volume of the cabinet appear, but the outcome of too much damping material inside the cabinet is a loss in performance at the low frequency response as the transducer was actually designed for a given box volume. This paper explores, through simulation in the COMSOL Multiphysics® software, how, by using rigid panels of absorbent material, and their optimized placement the purpose of having a smooth frequency response without losing bass performance can be achieved.

Figures used in the abstract

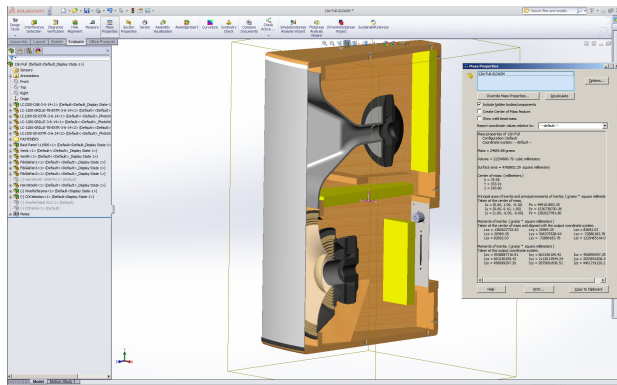


Figure 1: Rigid fiber glass panels in the cabinet.

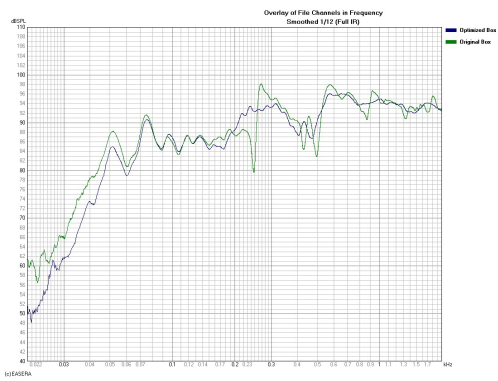


Figure 2: Frequency responses.