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Prediction of Physical Properties and Sound Absorption Performance of Automotive Interior Materials

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Abstract : Sound absorption coefficient is considered important when designing because noise affects emotion quality of car. It is designed with lots of experiment tunings in the field because it is unreliable to predict it for multi-layer material. In this paper, we present the design of sound absorption for automotive interior material with multiple layers using estimation software of sound absorption coefficient for reverberation chamber. Additionally, we introduce the method for estimation of physical properties required to predict sound absorption coefficient of car interior materials with multiple layers too. It is calculated by inverse algorithm. It is very economical to get information about physical properties without expensive equipment. Correlation test is carried out to ensure reliability for accuracy. The data to be used for the correlation is sound absorption coefficient measured in the reverberation chamber. In this way, it is considered economical and efficient to design automotive interior materials. And design optimization for sound absorption coefficient is also easy to implement when it is designed.

Keywords : sound absorption coefficient, optimization design, inverse algorithm, automotive interior material, multiple layers nonwoven, scaled reverberation chamber, sound impedance tubes
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