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DESIGN METHOD OF DAMPING TREATMENT FOR STRUCTURE-BORNE NOISE REDUCTION

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ABSTRACT

In many kinds of mechanical structures, the quietness becomes one of the important values, and the damping treatment using viscoelastic material is applied to reduce structure-borne noise. But, vibrational characteristics of viscoelastic material depend on temperature and frequency, so the systematic design of damped structures and the prediction of damping effects was difficult. This paper presents a prediction method of vibration by damping treatment applied to viscoelastic materials. The major points of this paper are as follows:

1. The iterative design procedure to determine the vibratory characteristics of a damped beam by viscoelastic material, whose properties are dependent on temperature and frequency, is shown.

2. The prediction methods of reduction in vibration, based on both modal analysis and the SEA method, are shown. Additionally, the estimated results using these methods are well in agreement with the measured results.

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