

유한요소해석을 통한 탄성폼이 대어진 덕트 내의 소음전파 특성 해석

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Finite Element Analysis for Sound Propagation Characteristics in a Duct Lined with Poroelastic Foams

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ABSTRACT

Axisymmetric finite element model is developed to determine sound propagation characteristics in a circular duct lined with a poroelastic foam. The foam and air models are derived based on the Biot's theory and the Helmholtz equation respectively and finally result in a quadratic eigenvalue problem in the wave number. Some cross sectional mode shapes are shown and sound attenuations and phase speeds of some acoustic modes are given. Those of fundamental modes are compared with those by forced response solutions and those from measurement results. The influence of lining thickness is also described on sound propagation characteristics.

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