

## 다공성 흡음재가 조합된 다중 다공판 시스템의 흡음성능에 관한 연구

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### A Study on the Sound Absorption of Multiple Layer Perforated Plate Systems Combined with Porous absorbing Materials

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**Key Words** : Absorption Coefficient(흡음계수), Acoustic Impedance(음향임피던스), Perforated Plate System(다공판 시스템), Porous Absorbing Materials(다공성 흡음재), Transfer Matrix Method(전달행렬법)

**Abstract** : The sound absorption coefficients for multiple layer perforated plate systems containing several compartments with airspaces and porous absorbing materials are estimated using the transfer matrix method developed in the previous paper. The absorption coefficients from transfer matrix method agree well with the values measured by the two-microphone impedance tube method for various combinations of perforated plates, airspaces or porous materials. Based on these results, a guidance for the design of multiple layer perforated plate systems combined with airspaces and porous absorbing materials is also discussed.

## 병렬 다공판 시스템의 흡음성능에 관한 연구

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### A Study on the Sound Absorbing Performance of Parallel Perforated Plate Systems

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**Key Words** : Acoustic Impedance(음향임피던스), Equivalent Electroacoustic Circuit Approach(전기음향동가회로법), Perforated Plate System(다공판 시스템), Sound Absorption Coefficient(흡음계수)

**Abstract** : An equivalent electroacoustic circuit approach of estimating the sound absorption coefficient for parallel perforated plate system is proposed. The proposed approach is validated by comparing the calculated absorption coefficients of a parallel single layer perforated plate system with the values measured by the two-microphone impedance tube method for various porosity and cavity depth. The sound absorbing performances of parallel and series perforated plate systems are discussed in detail from a spectral point of view. The proposed approach is further extended to the parallel multiple layer perforated plate system.