

ACOUSTICS2008/637
**The Perforated Panel Resonator with Flexible Tube Bundles and
its Applications**

Yadong Lu^a, Huide Tang^b, Qiang Wang^c, Jing Tian^a, Youli Qu^d and Bo Qiu^a

^aInstitute of Acoustics, Chinese Academy of Sciences, P. O. Box 2712, 21 Beisihuanxilu St., 100080 Beijing, China

^bTianjin Hearing-aid Factory, Chenglinzhuang Rd. No. 93, 300161 Tianjin, China

^cJinyusun Ventilation and Air-conditioning Equipment Ltd., Golden-delta Development Region. Tongzhou Dist., 101112 Beijing, China

^dBeijing Electrical Designing Institute, 15 Guanmenxijie St., 100055 Beijing, China

The sound absorptive mechanism and properties of the perforated panel resonator with flexible tube bundles are presented. Based upon that, some practical applications of the sound absorbing structure are introduced as follows. First of all, the perforated panel resonator with flexible tube bundles is used in designing a highly sound absorptive chamber, which is used as an audio-video laboratory. The acoustical performances of the chamber are presented. Second, the perforated panel resonator with flexible tube bundles is used in highly efficient duct silencer. The total noise level of axial fan source is attenuated to background noise level. Not only middle and high frequency noise is reduced, but also low frequency noise is suppressed considerably. Third, the perforated panel resonator with flexible tube bundles is used in a small-type centrifugal fan's casing treatments. The cut-off region of the centrifugal fan's casing is also acoustically treated. After the acoustical treatments, total sound power level of the fan is reduced obviously. Fourth, the perforated panel resonator with flexible tube bundles is used in designing the exhaust ducts and sound absorptive channel walls for an electrical transformer substation. The noise emitted from the transformer substation is reduced to surrounding background noise level.