

Acoustic Absorption Research on Woven Structure Fabrics

Himanshu Patil¹, Rutuja Bhangale², Krishan Pandey³, G. K. Raje⁴, Y. D. Kale⁵

Lecturer, Department of Mechanical Engineering^{1,2,3,4,5}
Pimpri Chinchwad Polytechnic, Pune, Maharashtra, India

Abstract: Noise has become one of the world's four major pollutant categories. Textiles have been employed as noise reduction materials in construction, automotive, and other industries because of their porous, light, and easy processing features, however there have been few investigations on woven fabrics' sound absorption properties. The effect of structural elements of woven fabrics on acoustic absorption was investigated in this research. Fabrics with plain, twill, and honeycomb weaves were woven with identical warp density and used as acoustic measuring samples, which were measured using an acoustical detecting platform based on an impedance tube. The experiment is carried out on a perforated panel to see how changes in thickness, porosity ratio, and cavity depth affect the sound absorption coefficient. The analysis is carried out using the MATLAB software. Although pore parameters have an impact on the acoustic properties of woven fabrics, the influence of pore features on textile acoustic absorption cannot be attributed solely to porosity. Sound absorption performance of woven fabrics may also be influenced by the number and shape of pores.

Keywords: Acoustic Absorption, Acoustical Property, etc.

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