A COMPARATIVE STUDY OF ACOUSTIC PERFORMANCE BETWEEN NATURAL AND SYNTHETIC WALL MATERIALS FOR SOUND INSULATION

Name : Aditia Apizka

Student ID : 4103211388

Supervisor : Faisal Ananda, ST., MT

ABSTRACT

This study aims to compare the acoustic performance of natural and synthetic sound insulation materials applied to building walls. The natural materials tested include coconut fiber and bamboo, while the synthetic materials used are glass wool and acoustic coco fiber. The research focuses on identifying the effectiveness of each material in reducing sound transmission at various frequencies.The research was conducted numerically using ANSYS software. Wall models with different insulation materials were simulated within an acoustic domain to analyze Transmission Loss (TL) and Sound Transmission Class (STC) values. The research stages included creating the geometry model, defining material properties, applying acoustic boundary conditions, and performing frequency response analysis. The simulation results were then compared to determine the material with the best sound insulation performance.The results show that natural materials have better sound attenuation at medium to high frequencies, although synthetic materials recorded slightly higher TL values numerically. These findings support the potential use of natural materials as environmentally friendly alternatives for sound insulation in building walls.

Keywords: *acoustik performance, ANSYS, natural materials, sound insulation, synthetic materials.*