Review – Volume 84, Journal of Building Engineering2024, Pages 1 - 30

Recent progress in natural fiber reinforced composite as sound absorber material

Abstract

In today's modern society, an emerging field that has garnered notable attention pertains to the management of sound. Effective control measures are needed because of the increase in noise pollution from urbanization and industrial growth. Effectively regulating the level of noise across all areas of engineering is imperative. The development of acoustic materials with exceptional absorption efficiency is a frontier area of study for acousticians and architects alike in the acoustic industry. This field has garnered the attention of material scientists owing to the multiple noteworthy characteristic properties it offers. Sound absorption materials commonly consist of conventional chemical and synthetic constituents that require replacement for various justifiable reasons, so substitution of these materials with natural materials is very important. The employment of sustainable, cost-effective, recyclable, and reproducible natural materials instead of conventional materials plays a crucial role in addressing a myriad of environmental concerns. These concerns include, but are not limited to, increasing greenhouse gas emissions (CO_2 levels), potential health risks, pollution of air and natural ecosystems, increasing the temperature (global warming), reduction of fossil fuels and raw materials, and the attainment of modern and ecologically sound cities. The main purpose of this review is to draw attention to the most promising natural sound fibers. Thus, the focus will primarily be on current trends in acoustic natural fibers, recycled materials, and fibers from agricultural wastes. Today, these acoustic fibers are very popular and also drive future directions, particularly by providing the next generation of researchers with considerable opportunities.

Keywords

Natural fiber reinforced composites; Noise pollution; Recyclable sound absorbers; Sound absorber materials; Sustainable acoustic materials; Waste natural fibers