Hibla: An Alternative Sound Absorption Material

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Noise is a major concern in mechanical systems and poor acoustic facilities found in homes, schools and industries. Furthermore, environmental and health issues of commercially-available acoustic materials led the researchers to favorable processes and develop acoustic materials from biomasses. This study aimed to utilize Abacá (Musa textilis), Bamboo (Bambusa merrilliana), and Water hyacinth (Eichhornia crassipes) that have properties for sound absorption. These biomasses were fiber extracted, blended with polyester as carrier fiber in proportions of 50:50 and 25:75 (biomass-polyester), carded, and needle-punched producing non-woven sound absorbing panels. Afterward, Hibla (fiber) underwent tests of reverberation, soundproofing, and other parameters for a non-woven material. In the Non-Standardized ASTM C423-17, Abaca-Polyester 50:50 (0.106 SAA) performed best, surpassing the commercial Rockwool (0.058 SAA). Soundproof Test with Testo816-1 Decibel Meter resulted to 53.94 dB of Water hyacinth-Polyester 50:50 comparable to 53.93 dB of ambient noise (negative control) and 53.95 dB of Rockwool. ASTM E1050-12 Standardized Test Method for Impedance and Absorption of Acoustical Material validated the sound absorption property of all Hibla panels (50:50) with the test results of 0.82 for Water hyacinth-polyester, 0.59 for Bamboo-polyester, and 0.58 for Abaca-polyester. As a non-woven fabric, Hibla passed the Standardized Tests of Thermogravimetric Analysis, Differential Thermal Analysis, Flammability Test, and Breaking Load in Tension Test. Thus, Hibla proved to have high sound absorption with better properties being cheaper, durable with high fire resistance and thermal insulation. Keywords: noise, acoustic, biomass, sound absorption, Hibla (fiber)

Awards Won:
Acoustical Society of America: Honorable Mention