THE EFFECT OF GLASSWOOL, COCONUT FIBER AND BANANA STEM FIBER ON NOISE AND HEAT RESISTANCE IN FREE FLOW EXHAUSTS

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ABSTRACK

This study aims to determine the effect of glasswool made from coconut fiber and banana stem fiber on noise reduction and heat resistance in a free-flow exhaust system. The research method used is an experimental approach with variations of muffler materials, namely standard glasswool, coconut fiber, banana stem fiber, and a combination of both. Noise testing was conducted using a sound level meter at engine speeds of 1500, 3000, 4000, and 5000 rpm, while heat resistance testing was carried out using a heating (pyrolysis) method by observing mass loss and physical changes of the material. The results showed that at 1500 rpm, coconut fiber produced the lowest noise level of 72.6 dB compared to other materials. At 3000–4000 rpm, the combination of coconut fiber and banana stem fiber demonstrated the best sound absorption performance with values of 85.2 dB and 88.2 dB, respectively. Meanwhile, at 5000 rpm, banana stem fiber produced the lowest noise level of 93.0 dB. The heat resistance test results indicated that natural fiber composites experienced mass loss and physical changes with increasing temperature, but still showed sufficient thermal stability for exhaust applications. Based on the results, it can be concluded that coconut fiber and banana stem fiber have the potential to be alternative materials to replace conventional glasswool in reducing noise and providing adequate heat resistance in free-flow exhaust systems.

Keywords: *glasswool, coconut fiber, banana stem fiber, noise, heat resistance, free-flow exhaust*