Title : Preparation of insulation boards from water hyacinth, textile waste and corn cob

Author(s) : **1.** Ms. Kanyapat Raknukool **Student ID :** 640510004
2. Ms. Phannapak Phayaklert **Student ID :** 640510149

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Advisor(s) : Dr. Sunsanee Komboonchoo

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ABSTRACT

This research aims to investigate the possibility of utilizing textile waste, water hyacinth, and corn cob residue which are byproducts of the industrial and agricultural sectors, as a part of production of thermal and acoustic insulation panels. Polyvinyl alcohol was used as a binder, citric acid as a cross-linking agent, and corn cob as a filler. The insulation panels were fabricated through hot pressing at 150°C for 70 minutes, followed by an additional pressing step at room temperature for 20 minutes. The effects of the water hyacinth-to-textile waste ratio and the influence of corn cob addition on the mechanical and physical properties, as well as the thermal and acoustic insulation performance of the panels, were examined. It was found that a 50:50 ratio of water hyacinth to textile waste yielded the highest bending strength of 5.904 ± 1.17 MPa. Furthermore, incorporating corn cob particles of 1.0 - 1.4 mm at 25–75% by weight demonstrated a tendency to enhance thermal insulation and sound absorption capabilities.