

# **Composite Construction Material from Fibrous Biomass**

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## **Abstract**

Two studies namely, feasibility study for producing energy saving construction materials from fibrous biomass and marketing surveys for acceptant on energy saving construction materials from fibrous biomass of potential buyers, are conducting parallely. Feasibility study for producing energy saving construction materials from fibrous biomass is focusing on productions of brick/block and wall/ceiling board from fibrous biomass. Certain amount of Portland cement, sand and water with 1.5, 3.0, 4.5, 5.5 and 8.5 percentages of pre-prepared fibers from Vetiver, Agave, Rice straw, and Wood pulp are used to produce energy saving brick or block. Results obtained indicated that brick/block produced with rice straw has the lowest average thermal conductivity following by brick/block made from Agave, Vetiver and Wood pulp respectively. Thermal conductivity of bricks/blocks made from all fibrous biomass was lower than the average thermal conductivity of commercial construction materials. Compressive strength of all bricks/blocks produced in the experiment was lower than the compressive strength of weight loaded and non-weight loaded brick/block given by Thai Industrial Standard Institute (TISI). 0.5:1, 1:1, 1.5:1 and 2:1 weight ratios of gypsum cement to pre-prepared fibers from Vetiver, Rice straw and Wood pulp including certain amount of water were formulas of materials used to produce wall/ceiling board. The average thermal conductivity of wall/ceiling board was similar to those of wall/ceiling boards available in the market. Results obtained from 3-points bending tests showed that bending strength of wall/ceiling boards produced by the study was lower than those of commercial wall/ceiling boards. Marketing surveys for acceptant on energy saving construction material from fibrous biomass of 200 potential buyers via pre-prepared questionnaires were found that 58 % of potential buyers willing to buy such energy saving construction materials and 30% of such potential buyers were attracted by the electrical energy saving potential.