

Title: EXPLORING THE USE OF AGRO BIO-WASTE CELLULOSIC FIBERS AS A POTENTIAL DRYWALL PANELBOARD MATERIAL FOR SUSTAINABLE BUILDING USE

[1]VILLAMOR-JUANGA, JEAN MARIE, [2] DE LA CRUZ, PATRICK DEO,
[1]University of the Philippines, Faculty of Architecture, UP , Davao Philippines
[2]ANCJA&IDI Inc., Makati City, Philippines

This research explored the potential use bio-waste cellulosic fibers as drywall panel board (DB) as construction material. The cellulosic fiber used in this study were primarily extracted from rice and banana crops agro-wastes which are highly cultivated in Philippines, other wastes used came from paper and carton boards. These biowaste products contribute to the environmental and climate change problems but can be mitigated by converting these wastes for productive reuse. In this experiment, the thermal conductivity (k value) and thermal resistivity (R-value) were determined. The materials tested were plaster of Paris as binder and perlite powder as fillers, with respect to plaster/perlite/fibrer ratio using percentage by weight, there were six (6) formulations used in the study, namely plaster of paris (*P-1), plaster of paris and perlite (P-2), waste papper and rice straw (WR), waste paper and banana fiber (WB), rice straw and banana fiber (RB), and waste paper, rice straw and banana fiber (WRB)*. The R-following values were obtained for each formulation during testing: *P-1 (0.36 h-ft2-°F/BTU), P-2 (0.49 h-ft2-°F/BTU), WR (0.83 h-ft2-°F/BTU), WB (0.67 h-ft2-°F/BTU), RB (0.88 h-ft2-°F/BTU),* and *WRB (0.68 h-ft2-°F/BTU).* Moisture and water absorption were also determined. Among the six (6) formulations, RB showed significant results having an R value of 0.88 h-ft2-°F/BTU when compared with commercially available drywall boards. The common drywall boards in the market have the following R-values: *fiber-cement board (0.19 h-ft2-°F/BTU), hardboard (0.69 h-ft2-°F/BTU), ordinary plywood (0.62 h-ft2- °F/BTU), medium-density particle board (0.52 h-ft2-°F/BTU), and gypsum wallboard (0.45 h-ft2-°F/BTU).* In theory, a higher R-value means that the material can lower the amount of heat gain inside the room. Hence, the material is energy efficient. Moreover, properties of the material such as acoustical capacity, fire resistivity and water absorption can be further explored.

Biography

Prof Jean Marie Villmaor-Junaga is professor at the Department of Architeture at the University of the Philippines and is also a practicing Architect for twenty years. She has been actively attending intenational conferences on research related to housing, planning and material develpment. The recent she has attended was in Albi France at the 6th International Conference on Engineering for Waste and BiomassValorisation and the International Conference on Communication Technologies on Education at Kos Greece. She has also made recent publications at the nternational Journal of Architecture and Urban Development (IJAUD) on Vertical Farming. Currently she is more into researches related to material development of agricultural wastes in order to maximize potential use of waste while at the same time support waste valorisation for a more sustainable and healthy environment.

Presenting author details
Full name: JEAN MARIE VILLAMOR JUANGA
Contact number: +63 9434380853
EMAIL: jeanmariejuanga@yahoo.com and jvjuanga@up.edu.ph
Univeristy Website: http://www2.upmin.edu.ph/index.php/home-sp-15232/up-mindanao/up-mindanao-officials
Session name/ number:
Category: (Oral presentation/ Poster presentation): Oral