Verification of Applicability of the Adhesive of Castor Oil in the Manufacture of Glued Laminated Bamboo

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Abstract

The current concern with the environment promotes the development of new technologies for production with use of alternative materials, from renewable resources, and changes in production processes, having as main objective the reduction of environmental impact. One of the alternatives for Cleaner Production is the use of castor oil derivatives instead of non-renewable sources, such as adhesives based on polyvinyl acetate (PVA), applied in the manufacturing process of Glued Laminated Bamboo. Based on the versatility of the bamboo laminate and the castor oil, and from the perspective of sustainability, this study aims to contribute to the application of new materials and processes, used in the manufacturing industry, by proposing the use of the oil castor adhesive for Glued Laminated Bamboo manufacturing, which can later be used in the manufacture of several products. To verify the applicability of the castor oil adhesive in the Glued Laminated Bamboo manufacture, mechanical tests of traction and shearing of the glue sheet were performed in specimens of the said material, and the results compared with the Cascorez 2590 and Waterbond adhesives. The results showed that the castor oil adhesive, in the traction test, has superior performance than the Waterbond adhesive and slightly below than the Cascorez 2590 adhesive, but in the shear test, the castor oil adhesive presented a slightly inferior performance than the other two adhesives used in the comparison.

Keywords: design, castor oil, glued laminated bamboo, sustainable development, PVA adhesives.