SIMULATION OF BIOCOMPOSITES FOR PRINTED CIRCUIT BOARD USING CELLULOSE TO REPLACE GLASS FIBERS

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ABSTRACT

This work describes the importance of the replacement of glass fibers by cellulose fibers in themanufacturing of Printed Circuit Board (PCB). To predict and quantify the influence of the replacement of fibers we have done a comparative study of different natural cellulose fibers and conventional glass fibers. Simulations were done using Finite Element Method (FEM) analysis applied to PCB materials. Several simulation experiments with composites made from glass fibres, micro and nano cellulose eucalyptus fibers, epoxy resins and copper foils are presented. The results indicate that the simulation of the PCB assembly process made using several materials from the PCB layers were able to predict key thermomechanical properties. Some PCB configuration were selected and modelled using different natural fibres from eucalyptus, cannabis, and bamboo. This natural fibres composites performance was compared with conventional PCB systems, built with glass fibers, and epoxide resin. The results of this work in progress indicate that the simulation of fiber-based materials is an important step to design and engineering sustainable PCB materials.

Keywords: Cellulose Fibers, Printed Circuit Board, Simulation, Sustainability, Finite Element Method

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