

WPC Soft: Prototype Simulation Software to Predict the Internal Changes During Hot Pressing of Wood Plastic Composites

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ABSTRACT

This paper proposes a simulation model for the heat transfer of the wood plastic composite (WPC), manufactured by using the compression moulding technique. A generalised one-dimensional model for transient heat transfer during hot pressing is proposed based on mathematical equations and engineering principles. Finite difference approach is applied using numerical methods, and a solution to the problem is obtained using explicit method. MATLAB is used for programming purpose. The results obtained from the simulation model are then validated with the experimental data available in the literature. It is observed that the simulation results are in close agreement with the experimental results within an acceptable range. The model is integrated with the GUI in the form of simulation software, and the user does not need knowledge of MATLAB. A case study is also performed for the application of the model. This simulation model can be useful for gaining the insight during compression moulding process and may be helpful to optimize the hot-pressing parameters to improve the quality of WPC, while reducing the pressing time.

KEYWORDS: simulation software; wood plastic composites; heat transfer; finite difference; compression moulding

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