World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

A Numerical Study on Micromechanical Aspects in Short Fiber Composites

Authors : I. Ioannou, I. M. Gitman

Abstract : This study focused on the contribution of micro-mechanical parameters on the macro-mechanical response of short fiber composites, namely polypropylene matrix reinforced by glass fibers. In the framework of this paper, an attention has been given to the glass fibers length, as micromechanical parameter influences the overall macroscopic material’s behavior. Three dimensional numerical models were developed and analyzed through the concept of a Representative Volume Element (RVE). Results of the RVE-based approach were compared with analytical Halpin-Tsai’s model.

Keywords : effective properties, homogenization, representative volume element, short fiber reinforced composites
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020

Open Science Index, Mathematical and Computational Sciences Vol:14, No:12, 2020 publications.waset.org/abstracts/60377.pdf