

NATURAL FIBRE REINFORCED POLYMER COMPOSITES FROM TEXTILE WASTES – AN OVERVIEW ON NEW POSSIBILITIES

Mihai-Paul Todor¹, Ciprian Bulei¹, Imre Kiss²

¹University Politehnica Timisoara, Faculty of Engineering Hunedoara, Doctoral School, Timisoara / Hunedoara, Romania

²University Politehnica Timisoara, Faculty of Engineering Hunedoara, Department of Engineering & Management, Romania
imre.kiss@fih.upt.ro

Abstract

The current interest for natural fibres from textile wastes as an environmentally correct composite reinforcement has motivated the investigation of new possibilities. For instance, the textile fibres from the textile wastes were recently found to have adequate mechanical properties to reinforce polymer composites. Most natural fibre composites, including the textile waste inserted composites, however, are fabricated with traditional non-degradable polymer matrix but still presenting a recycling advantage over the common glass fibre reinforced polymer composites. Therefore, textile waste inserted composites stand out as a relevant class of engineering materials.

The greatest challenge in working with natural fibre reinforced polymer composites is their large variation in properties and characteristics. However, with appropriate attention to fibre and resin design and structural geometry, natural fibre composites may prove a viable alternative to traditional materials in the future. Industrial ecology, eco-efficiency, and green chemistry are guiding the development of the next generation of materials, products, and processes.

Key words: polymeric composite materials, bio-reinforcement, bast fibers (flax, hemp or jute)

Acknowledgement: This work has been carried out under the project with the title “Doctoral and postdoctoral scholarships for research of excellence”, being co-financed from the European Social Fund, through the Sectorial Operational Program for Human Resources Development. We are immensely grateful to our colleagues from Faculty of Engineering Hunedoara, University Politehnica Timisoara, for their comments on an earlier version of the manuscript. We thank for their assistance that greatly improved the manuscript.