

Accepted Manuscript

A review of fire properties of natural fibre reinforced polymeric composites

N.K. Kim, S. Dutta, D. Bhattacharyya

PII: S0266-3538(17)31466-5

DOI: [10.1016/j.compscitech.2018.04.016](https://doi.org/10.1016/j.compscitech.2018.04.016)

Reference: CSTE 7178

To appear in: *Composites Science and Technology*

Received Date: 16 June 2017

Revised Date: 21 February 2018

Accepted Date: 11 April 2018

Please cite this article as: Kim NK, Dutta S, Bhattacharyya D, A review of fire properties of natural fibre reinforced polymeric composites, *Composites Science and Technology* (2018), doi: 10.1016/j.compscitech.2018.04.016.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



A review of fire properties of natural fibre reinforced polymeric composites

N.K. Kim, S. Dutta and D. Bhattacharyya*

Centre for Advanced Composite Materials, Department of Mechanical Engineering,
University of Auckland, New Zealand

*Corresponding author. Email: d.bhattacharyya@auckland.ac.nz / Tel.) + 64 9 923 8149

Abstract

Susceptibility to damage from heat and flame is one of the major issues for utilisation of natural fibre reinforced polymeric composites in practical applications. Thus, the knowledge of thermal decomposition and flammability of the bio-based fibres, polymers and their composites is highly required for the materials selection and the development of composite products. Moreover, suitable flame retardant treatments on these composites have shown to effectively enhance their thermal stability and fire resistance. This article provides a review of research on thermal behaviour and flammability of natural fibres, such as cellulose and protein based fibres, and polymers along with composites filled with these materials. Furthermore, eco-friendly flame retardant treatments to overcome the environmental impact of conventional flame retardants are introduced with the combined effects of natural fibres on composites' fire performance. In addition, a review of studies on the predictive models regarding thermal response and structural damages of composites in fire is also included with their advantages and limitations.

Keywords: A. Fibres, Polymer-matrix composites B. Thermal properties; C. Modelling;

Nominated: Flammability testing

Download English Version:

<https://daneshyari.com/en/article/7214364>

Download Persian Version:

<https://daneshyari.com/article/7214364>

[Daneshyari.com](https://daneshyari.com)