## Accepted Manuscript

Natural fiber textile reinforced bio-based composites: Mechanical properties, creep, and environmental impacts

Sabbie A. Miller

PII: S0959-6526(18)32005-5

DOI: 10.1016/j.jclepro.2018.07.038

Reference: JCLP 13492

To appear in: Journal of Cleaner Production

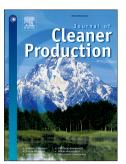
Received Date: 27 May 2018

Revised Date: 4 July 2018

Accepted Date: 4 July 2018

Please cite this article as: Miller SA, Natural fiber textile reinforced bio-based composites: Mechanical properties, creep, and environmental impacts, *Journal of Cleaner Production* (2018), doi: 10.1016/j.jclepro.2018.07.038.

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.



1	Natural fiber textile reinforced bio-based composites: mechanical properties, creep, and
2	environmental impacts
3	Sabbie A. Miller <sup>a,†</sup>
4	<sup>a</sup> Department of Civil and Environmental Engineering, University of California, Davis
5	2001 Ghausi Hall, One Shields Ave, Davis, CA, 95616
6	<sup>†</sup> Corresponding Author: T +1 530 754 6407, E sabmil@ucdavis.edu
7	
8	
9	Word count: 8,166
10	
11	Abstract:
12	With rising demand for construction materials, so too grow the environmental impacts associated with
13	their production. This trend has raised interest in the development of bio-based composites as
14	environmentally favorable alternatives to conventional materials. Yet, a greater understanding is needed
15	of both the mechanical properties of bio-based composites and their long-term properties, particularly
16	their creep deformation. This work examines the use of a bio-derived polymer matrix reinforced with
17	three types of natural fiber textiles. The mechanical properties and the creep deformation properties of
18	these composites are characterized showing a property dependence on textile type and orientation for
19	mechanical properties and creep deformation. Application of time-stress superposition to capture creep
20	behavior through accelerated testing is examined and is shown to be a promising means of capturing
21	long-term creep deformation. The results of this work show that the textile reinforced bio-based
22	composites studied have similar mechanical properties to several conventional construction materials.
23	Further, because time-stress superposition is shown to capture creep behavior of most of the composites
24	studied, this method might prove to be a means for expediting the collection and analysis of creep data
25 26	for bio-based composites. Finally, combined comparisons of mechanical properties and environmental
26	impacts of these bio-based composites suggest these materials could offer environmentally favorable
27	alternatives to conventional materials.
28	Kannender Die haard aanvaariter Green heberiger Die haard gebeuren Netwool Ghen terstilee
29	Keywords: Bio-based composite; Creep behavior; Bio-based polymer; Natural fiber textiles
30 21	
31 32	Declarations of interests popo
	Declarations of interest: none.
33	

- Declarations of interest: none.

Download English Version:

## https://daneshyari.com/en/article/8093541

Download Persian Version:

https://daneshyari.com/article/8093541

Daneshyari.com