Accepted Manuscript

The contribution of infrared thermography in the characterization of jute based composites

Simone Boccardi, Giovanni Maria Carlomagno, Carosena Meola, Pietro Russo, Giorgio Simeoli

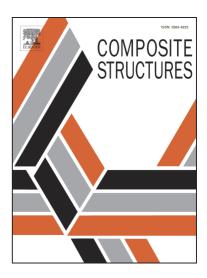
PII: S0263-8223(18)30025-4

DOI: https://doi.org/10.1016/j.compstruct.2018.02.014

Reference: COST 9364

To appear in: Composite Structures

Received Date: 3 January 2018
Revised Date: 5 February 2018
Accepted Date: 8 February 2018



Please cite this article as: Boccardi, S., Carlomagno, G.M., Meola, C., Russo, P., Simeoli, G., The contribution of infrared thermography in the characterization of jute based composites, *Composite Structures* (2018), doi: https://doi.org/10.1016/j.compstruct.2018.02.014

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.

ACCEPTED MANUSCRIPT

The contribution of infrared thermography in the characterization of jute based composites

Simone BOCCARDI ^a, Giovanni Maria CARLOMAGNO ^a, Carosena MEOLA ^{a1}, Pietro RUSSO ^b, Giorgio SIMEOLI ^b

^a Department of Industrial Engineering - Aerospace Division, University of Naples Federico II, Naples, Italy, simone.boccardi@unina.it, carmagno@unina.it, carmeola@unina.it

^b Institute for Polymers, Composites and Biomaterials, National Council of Research, Pozzuoli (Na), Italy, pietro.russo@unina.it, giorgio.simeoli@unina.it

Abstract

The growing environmental awareness is driving attention towards the development of ever more ecological and friendly materials, calling for the use of natural matrix and fibres in composite materials. The attention of this work is focused on two types of composites, which both include jute as reinforcement but different matrices. One matrix is polypropylene (PP) and the other one is polylactic acid (PLA), so to have partial, or total, natural materials. Several specimens are prepared and tested under impact, or cyclic and quasi-static bending. An infrared imaging device is used to inline monitoring of specimens under each test. The visualization of thermal effects coupled with mechanical stresses allows getting complimentary information, which may be exploited to better understand the reaction of materials to applied forces and their damaging modes.

Keywords: thermoplastic composites, PP/jute, PLA/jute, infrared thermography, in-line thermal monitoring, cyclic bending tests, quasi-static bending tests, impact tests.

1. Introduction

The discovery of plastic in the mid-1800's has been welcomed as a great event projected to revolutionize the human life. Indeed, a lightweight, strong, and relatively inexpensive material suddenly appeared to be convenient in replacing heavy metals. Yet, this event has now turned into a serious pollution problem since plastic materials, which are used in the production of so many

Department of Industrial Engineering - Aerospace Division, University of Naples Federico II, Via Claudio, 21, 80125 Napoli, Italy email: carmeola@unina.it

¹ Dr. Carosena Meola,

Download English Version:

https://daneshyari.com/en/article/6703795

Download Persian Version:

https://daneshyari.com/article/6703795

<u>Daneshyari.com</u>