

Accepted Manuscript

Damage of woven composite under translaminar cracking tests using infrared thermography

Teddy Lisle, Marie-Laetitia Pastor, Christophe Bouvet, Philippe Margueres

PII: S0263-8223(16)31396-4

DOI: <http://dx.doi.org/10.1016/j.compstruct.2016.11.030>

Reference: COST 7990

To appear in: *Composite Structures*

Received Date: 1 August 2016

Accepted Date: 10 November 2016



Please cite this article as: Lisle, T., Pastor, M-L., Bouvet, C., Margueres, P., Damage of woven composite under translaminar cracking tests using infrared thermography, *Composite Structures* (2016), doi: <http://dx.doi.org/10.1016/j.compstruct.2016.11.030>

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.

Damage of woven composite under translaminar cracking tests using infrared thermography

Teddy LISLE¹, Marie-Laetitia PASTOR¹, Christophe BOUVET^{1*}, Philippe MARGUERES¹

¹ Université de Toulouse, UPS, ISAE-Supaéro, ICA
10, avenue Edouard Belin, -BP 54032- 31055 Toulouse cedex 4

* Corresponding author: christophe.bouvet@isae.fr

Keywords: infrared thermography (IRT), fiber failure, fracture toughness, composite fracture

Abstract

The aim of this work is to increase the study of the notch translaminar propagation of the woven structures, using the InfraRed Thermography (IRT). A test of notch propagation under quasi-static traction was developed and used to study the failure phenomena on two different draping sequences. For each study, a local estimation of dissipated energies, associated with different damages, is carried out using the measurement of the surface temperature field. The study of heat source fields combined with micrographic observations allowed to define the matrix micro-cracking as the predominant damage phenomenon in crack tip. The critical energy release rate, obtained using IRT, corresponds to critical energy release rate reported in the literature for translaminar rupture of laminates. Furthermore, when brittle cracking develops in a thermosetting matrix laminate, the majority of irreversible mechanical energy (>90%) is dissipated as heat. In the case of brittle cracking, the developed method proves to be an efficient alternative technique for the local measure of energy release rate, even in cases where the variations in stiffness due to cracking phenomena remain low.

Download English Version:

<https://daneshyari.com/en/article/4917853>

Download Persian Version:

<https://daneshyari.com/article/4917853>

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