

Accepted Manuscript

Damage prediction in composite sandwich panels subjected to low-velocity impact

D. Feng, F. Aymerich

PII: S1359-835X(13)00121-8

DOI: <http://dx.doi.org/10.1016/j.compositesa.2013.04.010>

Reference: JCOMA 3389

To appear in: *Composites: Part A*



Please cite this article as: Feng, D., Aymerich, F., Damage prediction in composite sandwich panels subjected to low-velocity impact, *Composites: Part A* (2013), doi: <http://dx.doi.org/10.1016/j.compositesa.2013.04.010>

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 prediction in composite sandwich panels
subjected to low-velocity impact**

D. Feng, F. Aymerich

Department of Mechanical, Chemical and Materials Engineering - University of Cagliari

Piazza d'Armi, 09123 Cagliari, Italy

e-mail: dianshi@iris.unica.it; aymerich@iris.unica.it

Abstract

The paper illustrates the application of a finite element tool for simulating the structural and damage response of foam-based sandwich composites subjected to low-velocity impact. Onset and growth of typical damage modes occurring in the composite skins, such as fibre fracture, matrix cracking and delaminations, were simulated by the use of three-dimensional damage models (for intralaminar damage) and interfacial cohesive laws (for interlaminar damage). The nonlinear behaviour of the foam core was simulated by a crushable foam plasticity model. The FE results were compared with experimental data acquired by impact testing on sandwich panels consisting of carbon/epoxy facesheets bonded to a PVC foam. Good agreement was obtained between predictions and experiments in terms of force histories, force-displacement curves and dissipated energy. The proposed model was also capable of simulating correctly nature and size of impact damage, and of capturing the key features of individual delaminations at different depth locations.

Keywords: B. Impact behaviour; C. Finite element analysis (FEA); C. Delamination; Sandwich Composites

Download English Version:

<https://daneshyari.com/en/article/7892562>

Download Persian Version:

<https://daneshyari.com/article/7892562>

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