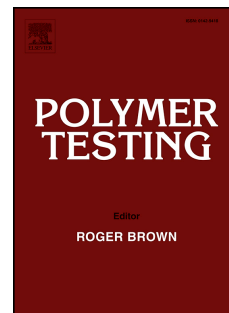


Accepted Manuscript

Experimental investigation on mechanical properties of unidirectional and woven fabric glass/epoxy composites under off-axis tensile loading

Deng'an Cai, Guangming Zhou, Xiaopei Wang, Chao Li, Jian Deng



PII: S0142-9418(16)31249-1

DOI: [10.1016/j.polymertesting.2016.12.023](https://doi.org/10.1016/j.polymertesting.2016.12.023)

Reference: POTE 4876

To appear in: *Polymer Testing*

Received Date: 14 November 2016

Accepted Date: 21 December 2016

Please cite this article as: D. Cai, G. Zhou, X. Wang, C. Li, J. Deng, Experimental investigation on mechanical properties of unidirectional and woven fabric glass/epoxy composites under off-axis tensile loading, *Polymer Testing* (2017), doi: 10.1016/j.polymertesting.2016.12.023.

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.

Material Properties

**Experimental investigation on mechanical properties of unidirectional and woven fabric
glass/epoxy composites under off-axis tensile loading**

Deng'an Cai^a, Guangming Zhou^{a,*}, Xiaopei Wang^a, Chao Li^{a,b}, Jian Deng^a

^a State Key Laboratory of Mechanics and Control of Mechanical Structures, Nanjing
University of Aeronautics and Astronautics, No. 29 Yuda Street, Nanjing 210016, P. R.
China

^b Nanjing Fiberglass R & D Institute, Nanjing 210012, P. R. China

* Corresponding author. Tel: +86 25 8489 2546, Fax: +86 25 8489 1422.

E-mail address: zhougm@nuaa.edu.cn (G. Zhou)

Abstract

Mechanical properties of unidirectional (UD) and woven fabric glass/epoxy composites under off-axis tensile loading were experimentally investigated. A number of off-axis tests considering different fibre orientations were performed to study the character and failure mechanisms of the composite laminates. The experimental results indicated that both off-axis elastic moduli and strength degrade with increasing off-axis angle in all cases, and the woven fabric composites present nonlinear stress-strain behaviour under off-axial tension loading. The Tsai-Wu criteria used for failure analysis of the UD and woven fabric composites were compared and discussed, especially considering different values of interaction coefficient F_{12} . The prediction results demonstrated that the Tsai-Wu criterion can be used successfully to analyse failure properties of the woven fabric composites under multiaxial stress conditions, where the criterion with the modified coefficient F_{12} obtained from the 45° off-axial tension tests is better and has higher accuracy. Finally, the specific failure modes were compared in

Download English Version:

<https://daneshyari.com/en/article/5205678>

Download Persian Version:

<https://daneshyari.com/article/5205678>

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