

Accepted Manuscript

Design for a cruciform coupon used for tensile biaxial transverse tests on composite materials

E. Correa, A. Barroso, M.D. Pérez, F. París



PII: S0266-3538(16)30724-2

DOI: [10.1016/j.compscitech.2017.03.045](https://doi.org/10.1016/j.compscitech.2017.03.045)

Reference: CSTE 6733

To appear in: *Composites Science and Technology*

Received Date: 13 July 2016

Revised Date: 1 March 2017

Accepted Date: 29 March 2017

Please cite this article as: Correa E, Barroso A, Pérez MD, París F, Design for a cruciform coupon used for tensile biaxial transverse tests on composite materials, *Composites Science and Technology* (2017), doi: 10.1016/j.compscitech.2017.03.045.

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.

Design for a cruciform coupon used for tensile biaxial transverse tests on composite materials

E. Correa*, A. Barroso, M.D. Pérez, F. París

Elasticity and Strength of Materials Group, Continuum Mechanics Department,
School of Engineering, University of Seville, Spain.

*Corresponding author ecorrea@us.es

ABSTRACT

This paper focuses on the design of the appropriate geometry for cruciform coupons conceived to be tested under tensile biaxial transverse loads. To this end, Finite Element models were developed and their results were used to propose a geometry which minimizes undesirable effects such as stress concentrations, develops a uniform state of biaxial stresses in the central zone of the coupon and assures that the failure takes place at this zone. The experimental results confirm the validity of the numerical models.

KEYWORDS: C. Finite element analysis. C. Transverse cracking. Cruciform coupon.

1. INTRODUCTION

The significant use of composite materials in the industry has been accompanied over the last few years by an increase in terms of responsibility that these materials hold in the components they are part of. As a consequence, it is essential that advances are made in our understanding of the mechanisms of damage affecting these materials as well as in the prediction of their possible appearance.

This study focuses on transverse failure, known as matrix/inter-fibre failure at lamina level. Such failure may appear in unidirectional laminates under transverse loads or in

Download English Version:

<https://daneshyari.com/en/article/5022152>

Download Persian Version:

<https://daneshyari.com/article/5022152>

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