Accepted Manuscript

Effect of tow thickness on the structural response of aerospace-grade spreadtow fabrics

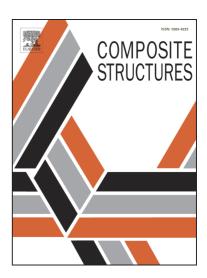
A. Arteiro, G. Catalanotti, J. Xavier, P. Linde, P.P. Camanho

PII: S0263-8223(16)33005-7

DOI: http://dx.doi.org/10.1016/j.compstruct.2017.06.047

Reference: COST 8634

To appear in: Composite Structures



Please cite this article as: Arteiro, A., Catalanotti, G., Xavier, J., Linde, P., Camanho, P.P., Effect of tow thickness on the structural response of aerospace-grade spread-tow fabrics, *Composite Structures* (2017), doi: http://dx.doi.org/10.1016/j.compstruct.2017.06.047

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

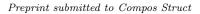
Effect of tow thickness on the structural response of aerospace-grade spread-tow fabrics

A. Arteiro^{a,*}, G. Catalanotti^b, J. Xavier^{c,d}, P. Linde^e, P.P. Camanho^{a,c}

Abstract

The effect of ply thickness on the onset of intralaminar and interlaminar damage is extremely important for the structural response of laminated composite structures. This subject has gained particular interest in recent years due to the introduction in the market of spread-tow, ultra-thin carbon-fibre reinforcements with different configurations. In the present paper, an experimental test campaign was carried out to study the structural response of aerospace-grade plain weave spread-tow fabrics (STFs) of different areal weights. The results showed that, in spite of an apparent superior longitudinal tensile strength of the thick STF, the multidirectional thin-STF laminate exhibited an improved tensile unnotched strength over the thick-STF laminate, attributed to its damage suppression capability. However, damage suppression was also responsible for similar tensile notched strengths. In compression, the thin-STF laminate performed substantially better than the thick-STF laminate in both unnotched and notched configurations. Finally, a similar bearing response was obtained in both STF laminates, in spite of a slightly higher resistance of the thin-STF laminate to the propagation of subcritical damage mechanisms.

^{*}Corresponding author. Tel.: +351 220414049. Email address: aarteiro@fe.up.pt (A. Arteiro)



^aDEMec, Faculdade de Engenharia, Universidade do Porto, Rua Dr. Roberto Frias, s/n, 4200-465 Porto, Portugal

 $[^]bSchool$ of Mechanical and Aerospace Engineering, Queen's University Belfast, Belfast, BT9 $5AH,\ UK$

^cINEGI, Instituto de Ciência e Inovação em Engenharia Mecânica e Engenharia Industrial, Rua Dr. Roberto Frias, 400, 4200-465 Porto, Portugal

^dCITAB, Universidade de Trás-os-Montes e Alto Douro, Engenharias I, Apartado 1013, 5001-801 Vila Real, Portugal

^eAIRBUS Operations GmbH, Kreetslag 10, 21129 Hamburg, Germany

Download English Version:

https://daneshyari.com/en/article/4911860

Download Persian Version:

https://daneshyari.com/article/4911860

<u>Daneshyari.com</u>