

Accepted Manuscript

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T. Scalici, G. Pitarresi, G. Catalanotti, F.P. van der Meer, A. Valenza

PII: S0263-8223(16)30613-4

DOI: <http://dx.doi.org/10.1016/j.compstruct.2016.09.033>

Reference: COST 7759

To appear in: *Composite Structures*

Received Date: 15 May 2016

Revised Date: 12 September 2016

Accepted Date: 13 September 2016



Please cite this article as: Scalici, T., Pitarresi, G., Catalanotti, G., van der Meer, F.P., Valenza, A., The Transverse Crack Tension test revisited: an experimental and numerical study, *Composite Structures* (2016), doi: <http://dx.doi.org/10.1016/j.compstruct.2016.09.033>

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The Transverse Crack Tension test revisited: an experimental and numerical study

T. Scalici^a, G. Pitarresi^b, G. Catalanotti^{c,d,*},
F.P. van der Meer^e, A. Valenza^a

^a*Università degli Studi di Palermo, DICAM, Viale delle Scienze, 90128 Palermo, Italy*

^b*Università degli Studi di Palermo, DICGIM, Viale delle Scienze, 90128 Palermo, Italy*

^c*INEGI, Rua Dr. Roberto Frias, 400, 4200-465 Porto, Portugal*

^d*School of Mechanical and Aerospace Engineering, Queen's University Belfast, Belfast BT9 5AH, UK*

^e*Faculty of Civil Engineering and Geosciences, Section of Structural Mechanics, Delft University of Technology, P.O. Box 5048, 2600 GA Delft, The Netherlands*

Abstract

Several problems arise when measuring the mode II interlaminar fracture toughness using a Transverse Crack Tension specimen; in particular, the fracture toughness depends on the geometry of the specimen and cannot be considered a material parameter. A preliminary experimental campaign was conducted on TCTs of different sizes but no fracture toughness was measured because the TCTs failed in an unacceptable way, invalidating the tests. A comprehensive numerical and experimental investigation is conducted to identify the main causes of this behaviour and a modification of the geometry of the specimen is proposed. It is believed that the obtained results represent a significant contribution in the understanding of the TCT test as a mode II characterization procedure and, at the same time, provide new guidelines to characterize the mode II crack propagation under tensile loads.

Key words: Delamination, Fracture Toughness, Numerical analysis, Experimental methods

* Corresponding author

Email address: g.catalanotti@qub.ac.uk (G. Catalanotti).

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