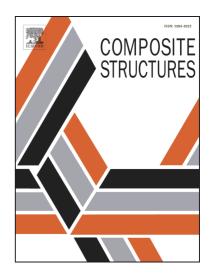
## Accepted Manuscript

Enhancing the electrical conductivity of carbon fibre thin-ply laminates with directly grown aligned carbon nanotubes

M. Russello, E.K. Diamanti, G. Catalanotti, F. Ohlsson, S.C. Hawkins, B.G. Falzon

PII:	\$0263-8223(18)31747-1
DOI:	https://doi.org/10.1016/j.compstruct.2018.08.040
Reference:	COST 10090

To appear in: Composite Structures



Please cite this article as: Russello, M., Diamanti, E.K., Catalanotti, G., Ohlsson, F., Hawkins, S.C., Falzon, B.G., Enhancing the electrical conductivity of carbon fibre thin-ply laminates with directly grown aligned carbon nanotubes, *Composite Structures* (2018), doi: https://doi.org/10.1016/j.compstruct.2018.08.040

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

### Enhancing the electrical conductivity of carbon fibre thin-ply laminates with directly grown aligned carbon nanotubes

M. Russello<sup>a</sup>, E.K. Diamanti<sup>a</sup>, G. Catalanotti<sup>a,\*</sup>, F. Ohlsson<sup>b</sup>, S.C. Hawkins<sup>a,c</sup> B.G. Falzon<sup>a</sup>

 <sup>a</sup>Advanced Composites Research Group (ACRG), School of Mechanical and Aerospace Engineering, Queen's University Belfast, Belfast BT9 5AH, UK
<sup>b</sup>Oxeon AB, Företagsgatan 24, Borås, Sweden
<sup>c</sup>Department of Material Science and Engineering, Monash University, Clayton, Victoria 3800, Australia

#### Abstract

The transverse electrical conductivity of thin-ply carbon fibre laminates, enhanced with carbon nanotubes (CNTs), was investigated experimentally. CNTs were directly synthesised on spread tow tapes of UTS50S carbon fibre through chemical vapour deposition (CVD). Unidirectional laminates were manufactured using both a thermosetting (epoxy) and a thermoplastic resin (polypropylene). A substantial increase in the electrical conductivity and a decrease in electrical anisotropy was observed for both the material systems investigated. Improvement in conductivity by a factor of 8 for the epoxy specimens, and 28 for the polypropylene specimens were reported.

*Keywords:* Carbon nanotubes, Thin-ply laminates, Electrical properties, Chemical vapour deposition (CVD)

#### 1. Introduction

A renewed interest in the influence of ply thickness on the structural response of composite laminates, has been facilitated with the recent emergence of thinply laminates. Thin-plies are obtained through a technique which spreads fibre

Preprint submitted to Composite Structures

<sup>\*</sup>Corresponding author

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

Download English Version:

# https://daneshyari.com/en/article/10131465

Download Persian Version:

https://daneshyari.com/article/10131465

Daneshyari.com