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

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## 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)

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## 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 thin-ply laminates. Thin-ply laminates are obtained through a technique which spreads fibre

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