

Carbon fiber/graphene doped epoxy demonstrator for aeronautic applications

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The increasing demand of more efficient structures in terms of weight, cost and energy efficiency have gained a great importance in transport industry last years. This has resulted in the research of new multifunctional materials which fulfil these objectives. For this reason, the incorporation of graphene related materials (GRMs) to carbon fibre reinforced polymers (CFRP) is one of the solutions that are proposed to obtain multiscale materials that provide a multifunctional behaviour, opening new application fields that conventional composite cannot satisfy [1]. Several authors have confirm that the incorporation of GRMs to CFRP improve its performance [2,3].

In this work, carbon fiber/ graphene doped epoxy laminates with different lay-up and number of layers have been manufactured by hand-lay up. A complete characterization was carried out in order to evaluate the effect of graphene addition in mechanical, physic-chemical and electrical properties of CFRP. Afterwards, these materials were employed to manufacture an aeronautic demonstrator based on a skin with two stringers (Figure 1 and Figure 2).

References

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[2] P. He, B. Huang, L.Liu, Q. Huang, T.Chen, Polymer Composites, 37 (2016) 1515-1522

[3] W. Qin, F. Vautard, L.T. Drzal, J. Yu, Compos. Part B Eng., 69 (2015) 335-341.

Figures

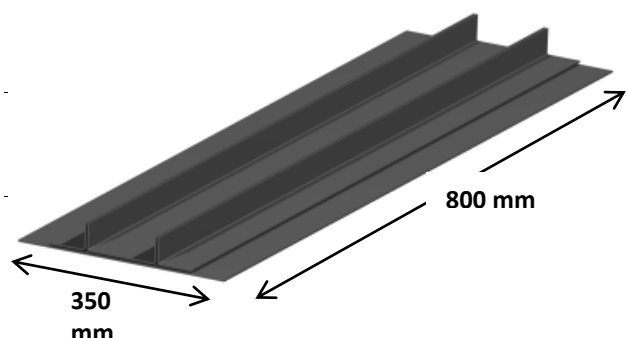


Figure 1: Final carbon fiber/graphene doped epoxy demonstrator