

STUDY OF MANUFACTURING DEFECTS AND SURFACE PREPARATION OF COATED COMPOSITE LAMINATES IN WIND TURBINE BLADES. A VIBRO-ACOUSTIC APPROACH

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ABSTRACT

The erosion of wind turbine blade leading edges has a large impact on the LCoE (Levelized Cost of Energy) for wind. Solutions need to be developed to mitigate this problem, and the blade surface coating design is regarded as a key issue for the wind energy industry. Resin Infusion (RI) is increasingly used in wind energy systems where low weight and high mechanical performance materials are demanded. In the current work, an investigation (among others) has been conducted into the manufacturing of the laminate and the coating process. The erosion damage is affected by the repetitive shock wave caused by the collapsing water droplet on impact. The stress waves will be transmitted to the substrate, so microstructural discontinuities as void contents and lack of impregnation due to its processing play a key role on its deterioration. Experimental results are presented and discussed to relate both the manufacturing and coating process and the material Non Destructive Testing characterization with its acoustic and mechanical performance.