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Novel CFRP Adhesive Joints and Structures for Offshore Application

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Abstract : Novel wind-lens turbine designs can augment power output. Vacuum-Assisted Resin Transfer Molding (VARTM) is used to form large and complex structures from a Carbon Fiber Reinforced Polymer (CFRP) composite. Typically, wind-lens turbine structures are fabricated in segments, and then bonded to form the final structure. This paper introduces five new adhesive joints, divided into two groups: One is constructed between dry carbon and CFRP fabrics, and the other is constructed with two dry carbon fibers. All joints and CFRP fabrics were made in our laboratory using VARTM manufacturing techniques. Specimens were prepared for tensile testing to measure joint performance. The results showed that the second group of joints achieved a higher tensile strength than the first group. On the other hand, the tensile fracture behavior of the two groups showed the same pattern of crack originating near the joint ends followed by crack propagation until fracture.

Keywords : adhesive joints, CFRP, VARTM, resin transfer molding
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