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Cure monitoring of composites with embedded piezoelectric sensors

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ABSTRACT

Manufacturing of carbon fiber reinforced polymers (CFRPs) presents challenges because of uncertainty in the exact conditions of cure in the material, especially in a complex structure, and this affects the quality of the finished product. This work evaluates the use of piezoelectric sensors embedded into CFRP layups before curing to monitor the composite material during the cure cycle. These sensors were used to propagate ultrasonic waves through the structure at different stages during cure. By examining features of the changing ultrasonic signal, the corresponding changes in material properties of the composite can be observed.