

Damage Analysis In Open Hole Composite Specimens By Acoustic Emission: Experimental Investigation

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Abstract : In the present work, an experimental study is carried out using acoustic emission and DIC techniques to analyze the damage of open hole woven composite carbon/epoxy under solicitations. Damage mechanisms were identified based on acoustic emission parameters such as amplitude, energy, and cumulative account and rise time. The findings of the AE measurement were successfully identified by digital image correlation (DIC) measurements. The evolution value of bolt angle inclination during tensile tests was studied and analyzed. Consequently, the relationship between the bolts inclinations angles during tensile tests associated with failure modes of composite materials fastened joints is determined. Moreover, there is an interaction between laminate pattern, laminate thickness, fastener size and type, surface strain concentrations, and out-of-plane displacement. Conclusions are supported by microscopic visualizations of the composite specimen.

Keywords : damage analysis, composite specimens, acoustic emission