

عنوان مقاله:

Effect of shape memory alloy wires on energy absorption of laminatedcomposites in Tensile impact- Experimental study

محل انتشار:

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خلاصه مقاله:

In this paper, energy absorption of composite laminate reinforced by shape memory alloy (SMA) wires are investigated under tensile impact loading experimentally. This study is concerned with the characterization of laminated plates for energy absorption behavior under tensile impact loadings. A pendulum type impact test system using a fixture designed for Charpy impact machine is constructed for the experimental study according to standard EN ISO 3167. Composite laminates made by 4 layers of fiber glass/epoxy composites reinforced by nickel- itanium (NiTi) shape memory alloy (SMA) wires are prepared. Three types of composite laminates are made in this study, namely, the composite laminate without SMA wires, the laminate with one SMA wire with 2% pre-strain and the laminate with two SMA wires with 2% pre-strain with the same cross sections. Experimental investigations on impact tensile response of composite laminates revealed that the absorbed energy by specimens without SMA wires, specimens reinforced by one SMA wire and specimens reinforced by two SMA wires are 11.46 J, 13.41 J and 20.68 J. As could be observed, the results showed a significant effect of presence of embedding SMA wires into composite laminates on energy absorptions in impact tensile loading, by 17% and 80% for one and two embedded wires, respectively. The fracture surface of the tested specimens are also studied to see the effect of SMA wires on fracture .behavior

كلمات كليدي:

Shape memory alloy (SMA), Laminated composites, Tensile impact, Energy absorption

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