

عنوان مقاله:

Analysis of Elastic-Plastic Behavior of Fiber Metal Laminates Subjected to In-Plane Tensile Loading

محل انتشار:

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خلاصه مقاله:

Fiber metal laminates are hybrid laminates consisting of thin alternating bonded layers of aluminum and fiber/epoxy. ARALL (Aramid aluminum laminate) and GALARE (glass fiber reinforced aluminum laminate) are specific kinds of fiber metal laminates that consist of thin aluminum sheets along with Kevlar/Epoxy and Glass/Epoxy composite layers, respectively. In this study, nonlinear tensile behavior of GLARE fiber metal laminates under in-plane loading conditions has been investigated. Due to the elastic-plastic behavior of aluminum layers, elastic analyses are not enough to accurately predict the tensile response. Thus, it is necessary to consider and explain the inelastic deformation behavior of GLARE laminates after yielding of aluminum alloy layers. Two appropriate analytical approaches, the orthotropic plasticity and modified classical laminated plate theories, have been used to predict the stress-strain response and deformation behavior of GLARE laminates. An acceptable agreement was observed between the two models. Results show that the GLARE behavior is almost bilinear under tensile loading condition and the tensile strength of unidirectional GLARE laminates are substantially stronger than aluminum alloys in the longitudinal direction.

کلمات کلیدی:

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