عنوان مقاله:

Analytical Solutions of Stress Field in Adhesively Bonded Composite Single-lap Joints under Mechanical Loadings

محل انتشار:

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خلاصه مقاله:

In this paper, considering an adhesively bonded composite single-lap joint, a novel approach is presented to predict the peel and shear stress distributions of the adhesive layer for an ASTM standard test sample.In the current method, the equilibrium equations are derived using the energy method and based on theTimoshenko’s beam theory. Two solution procedures then are discussed; one of them represents a solution approach based on the direct variational method allied with use of the Ritz approximation; while the second one is based on a linear estimating function. Unlike previous methods, in which the variation of stress through the thickness of adhesive is neglected or is assumed to be linear and they cannot be used to analyze the joints with thick adhesive layers; considering the effects of adhesive thickness makes it possible to employ present method to analyze the joints with thick adhesive layers as well as thin ones.

کلمات کلیدی:

Adhesive Bonding,Composite Joint,Interlaminar Stress,Analytical Solution