Abstract

A model able to predict the delamination mechanisms of composite honeycomb structures under thermal loading is presented. The use of a simulation software for some applications may not be sufficient to obtain the results expected; hence, the interest in developing modular calculation codes which would allow one to determine the rigidity matrix of a honeycomb panel, the deformation of its members, the field of shear strains, strains, and stresses in the panel plane on varying the physical parameters and checking the strength of each layer and of the entire panel. In order to test the reliability of the program developed, the results obtained are compared with those given in the literature. A specific model of Young's modulus under thermal loads is proposed, which takes into consideration the heat flux function, the thermal conductivity, the convection heat-transfer coefficients of the surrounding area inside and outside the panel, the exchange area in contact with air, the thickness of the honeycomb core, the upper and lower skins, and the adhesive layer. To verify the fracture strength of each panel, the Tsai–Wu criterion is used