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ANALYSIS OF THE DCB TEST OF ANGLE-PLY LAMINATES INCLUDING RESIDUAL STRESSES

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Abstract

A new method for obtaining energy release rate by the Double Cantilever Beam test for angle-ply laminates is proposed. Two different sequences, symmetric and anti-symmetric, have been studied. The fact that the layers are oriented at different angles and the residual stresses, causes the existence of mixed mode fracture. The analytical model presented, based on the complementary energy of a laminated beam, is an extension of a previous model for unidirectional laminates and includes hygrothermal effects. Experimental results of the energy release rate obtained by means of the area method agree with those determined by the proposed approach.

Keywords; Delamination; Double Cantilever Beam; Multidirectional.

1. Introduction

Delamination is one of the most common failures in laminated composites due mainly to the low interlaminar strength of these materials. The double cantilever beam (DCB)

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