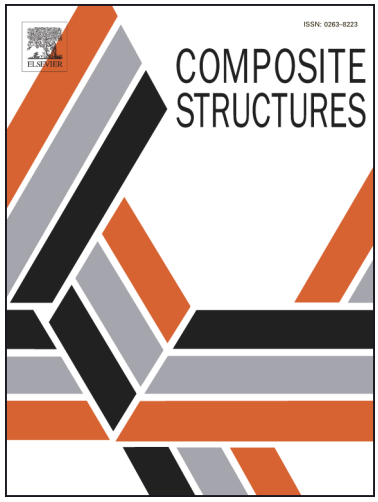

Review

A review of analytical models to describe pull-out behavior–Fiber/matrix adhesion

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A review of analytical models to describe pull-out behavior– Fiber/matrix adhesion

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Abstract

Micromechanical tests are reliable tools to study the failure mechanisms in composites reinforced with continuous fibers. This paper presents an overview of various analytical models developed to study the pullout (push-back) behavior of a fiber embedded in a matrix block to characterize the fiber/matrix interfacial adhesion. Two approaches can be distinguished: one based on a maximum stress criterion (shear lag) and the other based on fracture mechanics. This article gives an overview of the analytical models reported in the literature to measure the shear strength and critical fracture energy at the interface, the parameters influencing these properties, the geometry of the model, embedded length of the fiber, fiber diameter and loading conditions (opening width between the knife-edges for example), including components (fiber, matrix, interface), manufacturing route and the resulting defects.

Key Words: Interface; pull-out; interfacial shear strength; micro-indentation; damage.

Contents