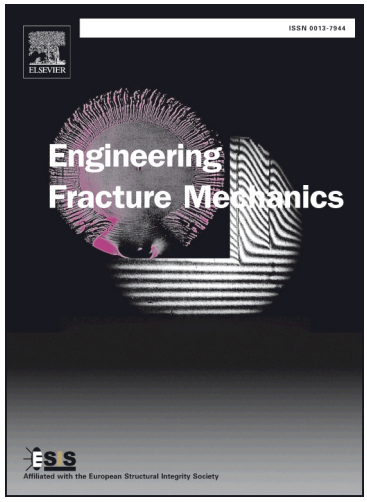

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Effects of Aluminum Surface Treatments on the Interfacial Fracture Toughness of Carbon-Fiber Aluminum Laminates

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Abstract

The influence of aluminum surface treatment on the interfacial delamination performance of carbon/epoxy composite and aluminum substrate was studied. Aluminum substrates were treated chemically with acid, alkaline and both individually. AFM images suggest high roughness for acid treatment and porous oxide layer for alkaline treatment, respectively. The plate theory was employed in order to obtain the energy release rate of asymmetric double cantilever beam (ADCB). The results indicated improvements of interfacial fracture toughness for acid then alkaline treatment of aluminum substrates. Finite element study of crack growth proved more reliability of energy release rates obtained by plate theory analysis rather than compliance calibration method, for ADCB specimen.

Keywords

Fiber metal laminate; Cohesive zone modelling; Delamination; Interface fracture; Fiber bridging.

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