

On the Fatigue Behavior of a Triphasic Composite

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Abstract : This paper presents the results of an experimental characterization of a glass fibre-epoxy composite. The behavior of the traditional two-phase composite has been compared with the one of a new three-phase composite where the epoxy matrix was modified by addition of a 3% weight fraction of montmorillonite nano-particles. Two different types of nano-clays, Cloisite® 30B and RXG7000, produced by Southern Clay Products Inc., have been considered. Three-point bending tests, both monotonic and cyclic, were carried out. A strong reduction of the ultimate flexural strength upon nano-modification has been observed in quasi-static tests. Fatigue tests yielded a smaller strength loss. In both quasi-static and fatigue tests a more pronounced tendency to delamination has been noticed in three-phase composites, especially in the case of 30B nano-clay, with respect to the standard two-phase glass fiber composite.

Keywords : bending fatigue, epoxy resin, glass fiber, montmorillonite

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