



## Fatigue of Woven Composite Laminates in Off-Axis Loading I. The Mastercurves

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(Received 27 February 2004; in final form 9 June 2004)

**Abstract.** The behaviour of woven orthotropic composite laminates in static and fatigue off-axis loading is described. It is shown that all phenomena: linear and nonlinear deformation; accumulation of damage, measured as change of cyclic modulus or hysteresis loop; and the static and cyclic strength can be described by single master curves using the generalized stress and strain functions. These functions always contain the quadratic expressions of invariants of orthotropy, but coefficients of the invariants depend on the severity of nonlinearity in the described processes or phenomena.

**Key words:** woven composite laminates, fatigue, off-axis loading, mastercurves.