

MODELING THE FATIGUE BEHAVIOR OF GLASS FIBER REINFORCED THERMOPLASTIC AND THERMOSETTING MATRICES

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The flexural fatigue behavior of continuous and short glass reinforced composites was investigated under four-point bending loading. The effect of mean stress and stress amplitude was identified. It was found that the fatigue life decreased rapidly with the decreasing stress ratio (i.e. the ratio between the minimum and the maximum stress). Further, the specimen lifetime for any loading mode increased with: (a) decreasing load range and decreasing stress ratio and (b) decreasing mean load and increasing stress ratio. From the above observations a brand new two-parameter model based on strength degradation was developed accounting for both the mean load and the load range, in order to express analytically the strength variation during fatigue cycle evolution.