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Mechanics of hybrid polymer composites: analytical and computational study. (English)

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Summary: Three different models with increased complexity to study the effects of hybridization on the tensile failure of hybrid composites are proposed. The first model is a model for dry bundles of fibres based on the statistics of fibre strength. The second is a model for composite materials based on the multiple fragmentation phenomenon. Lastly, a micromechanical numerical model is developed that considers a random distribution of fibres and takes into account the stochastic nature of fibre strength. This study aims to understand the controlling factors that lead to pseudo-ductility, as well as establish the sequence of failure mechanisms in hybrid composites under tensile loadings.

MSC:

74E30 Composite and mixture properties

74S30 Other numerical methods in solid mechanics (MSC2010)

Cited in 1 Document

Keywords:

hybrid composites; pseudo-ductility; analytical modelling; numerical modelling

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