

Hybrid and synthetic FRP composites under different strain rates: a review

ABSTRACT

As a high-demand material, polymer matrix composites are being used in many advanced industrial applications. Due to ecological issues in the past decade, some attention has been paid to the use of natural fibers. However, using only natural fibers is not desirable for advanced applications. Therefore, hybridization of natural and synthetic fibers appears to be a good solution for the next generation of polymeric composite structures. Composite structures are normally made for various harsh operational conditions, and studies on loading rate and strain-dependency are essential in the design stage of the structures. This review aimed to highlight the different materials' content of hybrid composites in the literature, while addressing the different methods of material characterization for various ranges of strain rates. In addition, this work covers the testing methods, possible failure, and damage mechanisms of hybrid and synthetic FRP composites. Some studies about different numerical models and analytical methods that are applicable for composite structures under different strain rates are described.