Palliatives for low velocity impact damage in composite laminates

ABSTRACT

Fibre reinforced polymer laminated composites are susceptible to impact damage during manufacture, normal operation, maintenance, and/or other stages of their life cycle. Initiation and growth of such damage lead to dramatic loss in the structural integrity and strength of laminates.This damage is generally difficult to detect and repair.This makes it important to find a preventive solution. There has been abundance of research dealing with the impact damage evolution of composite laminates and methods to mitigate and alleviate the damage initiation and growth. This article presents a comprehensive review of different strategies dealing with development of new composite materials investigated by several research groups that can be used to mitigate the low velocity impact damage in laminated composites. Hybrid composites, composites with tough thermoplastic resins, modified matrices, surface modification of fibres, translaminar reinforcements, and interlaminar modifications such as interleaving, short fibre reinforcement, and particle based interlayer are discussed in this article. A critical evaluation of various techniques capable of enhancing impact performance of laminated composites and future directions in this research field are presented in this article.