Composites Part B

Volume 145, Issue 7, 2018, Pages 189-196

Experimental investigation of notch effect and ply number on mechanicalbehavior of interply hybrid laminates (glass/carbon/epoxy)

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Abstract: The great advantages of hybrid composite materials reside in the synergistic effect of their constituent materialsand that make them very attractive for advanced applications. Nevertheless, the interactive effect of the intrinsicproperties of each element further complicates understanding of their behavior. In this study, an experimentalanalysis of the mechanical behavior of interply hybrid laminates (glass/carbon/epoxy) and the estimation of thehybridization effect with respect to mono-reinforced laminates were carried out. It has been found that theincorporation of 25% carbon fibers in the glass/epoxy laminates contributes significantly to improving theirtensile mechanical properties but they degrade as the number of glass plies increase. In addition, investigationswere carried out on the sensitivity of these materials to geometric imperfections. To this end, the influence of acircular notch has been highlighted. From the results obtained, it was found that the greatest loss of properties isrecorded for the hybrid materials; however, they remain the most resistant.

Keywords : Hybrid composite materials, laminates, notch, mechanical properties