Measurement of ballistic impact properties of woven kenaf–aramid hybrid composites

ABSTRACT

In this study, the woven kenaf–Kevlar hybrid composites are prepared while vary the woven kenaf content from 5.40 to 14.99 by volume fraction using two different arrangements. Ballistic measurement tests of hybrid composites were carried out by using fragment simulating projectiles at different impact and residual velocities. The damaged samples of hybrid composites were visually inspected with respect to failure modes. The results show that hybrid composites (14 layers of Kevlar and 2 layers of kenaf) show a superior ballistic performance as compared to the other of hybrid composites. Obtained results from thickness and areal density of the hybrid composites indicate that both properties increase with the ballistic properties of the hybrid composites. We concluded that present study on Kevlar/Kenaf hybrid composites will open new avenues to do research on the optimum layer arrangement of these two fibres to reduce the use of synthetic fibre in ballistic laminate composites.

Keyword: Woven kenaf; Kevlar; Hybrid composites; Ballistic limit velocity; Energy absorption